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1 Introduction

The present thesis deals with the changes occurring in repeatedly translated texts. The changes are being analysed on two technical articles from the field of engineering, the topics of which are: welding and the history of roller bearings. The texts were translated four times between Czech and English (Czech original – English translation – Czech translation – English translation – final Czech translation) by a group of students enrolled in a university English-language Translation program (soon-to-be translators), and by professional translators working for various Czech translation agencies. The reason for having two groups translating one of the texts simultaneously is their different level of competence (further explained in Chapter 3.2).

The aim of the research is to reveal the processes negatively affecting the quality of repeated translations, and consequently to help their prevention. The research results shall provide some guidance for further research of e.g. relay translation – translation of a translated text (Baker & Saldanha, 1998, p. 230) – commonly used in the European Union or in subtitling. The present thesis may serve as a pilot study for further research since relay translation is more complicated and concerns more than two languages. Another aim of the present thesis is to provide advice to those translators who translate texts intended for chain translation.

The thesis is divided into several parts. The first chapter (Chapter 2) explains the process of the whole experiment with repeated translation accompanied by an illustrative diagram. The chapter continues with the description of methodology.

The third chapter deals with various approaches to translation quality assessment, and provides justification for the chosen method. Further, it also mentions the concepts of translator competence, risk analysis, style, and their implications for the research.

The following chapter (Chapter 4) provides detailed explanation of the first part of the research methodology. It presents Christiane Nord's approach to translation evaluation. She breaks the factors having effect on the translation quality down into external (or extratextual) and internal (or intratextual) factors. Both groups then consist of several subcategories, such as sender, intention, recipient, etc.

Right after the theoretical explanation of the model, the first part of the analysis follows (Chapter 5). Given the extent of this part, the findings are displayed in three

separate tables (one for each target text) at the beginning of the chapter. The chapter further provides detailed analysis of the most relevant factors mentioned in the preceding methodology. It also contains two shorter conclusions on both the external and internal factors, summarising the results arising from the comparison of source and target texts.

The thesis continues with an error analysis of translation units (Chapter 6) which explores the problem of defining an error and its relevance in translation. The chapter presents several methods and scales used at universities and in professional agencies. Later, it also contains the results of the error analysis conducted on the three target texts accompanied by concrete examples of mistakes displayed in tables with commentaries.

The error analysis is concluded with the seventh chapter dealing with Pym's concept of directional vs. natural equivalent. All the translation errors associated with the problem of equivalence are examined and presented in separate tables containing all the solutions from the whole process of repeated translation.

The thesis is finished with a conclusion (Chapter 8) summarising all the aspects in which the repeatedly translated texts have changed and the evaluation of the thesis results. The appendices contain all the materials used for the analysis.

List of acronyms used within the thesis:

TQA Translation Quality Assessment

ST Source Text

TT Target Text

SL Source Language

TL Target Language

STT Students' Target Text

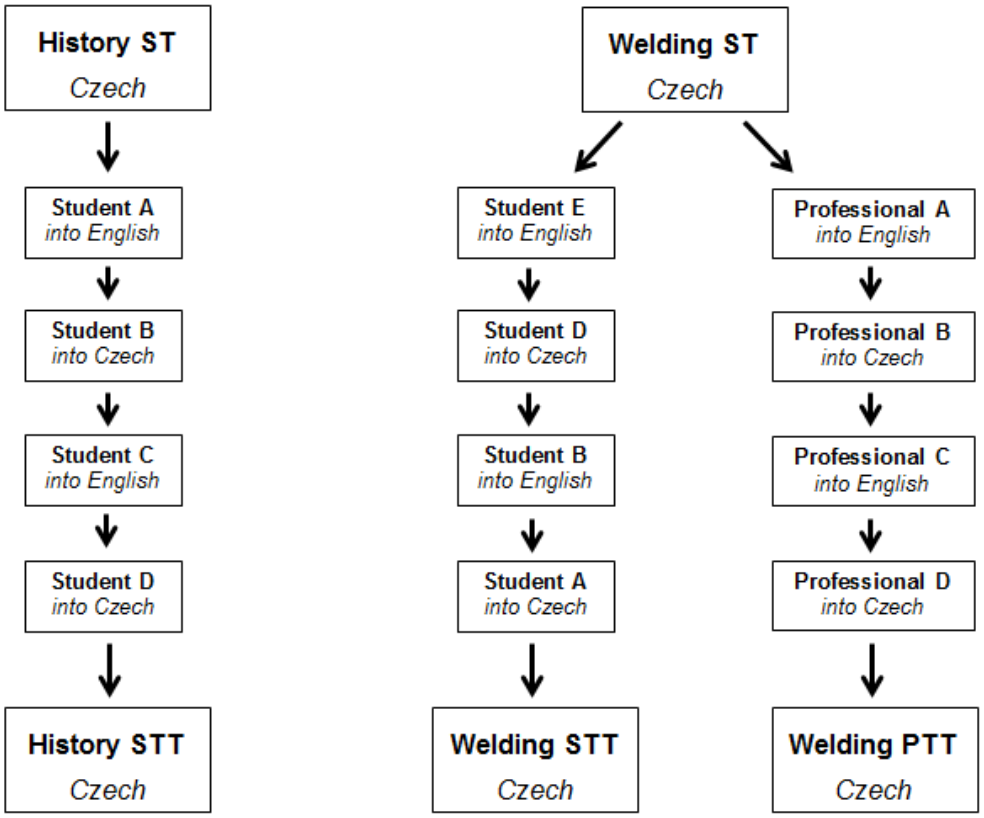
PTT Professionals' Target Text

2 Methodology

2.1 Description of the Experiment

Two shorter texts from the field of engineering were selected for the present analysis. First of them, the text entitled "The History of Roller Bearing[1]" (only "History" thereinafter), focuses on the historical development of roller bearings, and the other one, "Welded Structures and Components[2]" (only "Welding" thereinafter), deals with various types of welded structures and components. Both texts were translated four times between Czech and English by selected translators who can be divided into two groups: professional translators and students of translation. The students were asked to translate both the "History" and the "Welding text, whereas the professionals only the latter one. The diagram (Figure 1) which shows the whole process of the experiment follows:

Figure 1: Process of the Experiment



[1] Historie vzniku valivých ložisek
[2] Svařované konstrukce a součásti

The members of the groups were chosen with the aim to form two separate groups of translators possessing approximately the same level of translator competence. At the time of the experiment, students A, B, C, D, and E were students of the Master's degree studies of the English-language Translation taught at the Faculty of Arts, Masaryk University in Brno (the Czech Republic), and all of them were just about to finish their fourth semester with the exception of student C, who was finishing his second semester. The standard length of the program is two academic years (four semesters). All members of this group were Czechs and full-time students.

The other group of translators consisted of professionals working for various translation agencies all over the Czech Republic, as it is shown in the table (Figure 2) below:

Figure 2: Translation Agencies

Translator	Agency
Professional A	Abiturient.cz, Brno
Professional B	Eufrat, Plzeň
Professional C	Jipka, Praha
Professional D	Skřivánek, Plzeň

The agencies were selected randomly; however, a particular emphasis was laid on their size due to the endeavour to create a representative sample of professionals. Most of the agencies run more than one subsidiary in at least two Czech cities and offer translation into several languages.

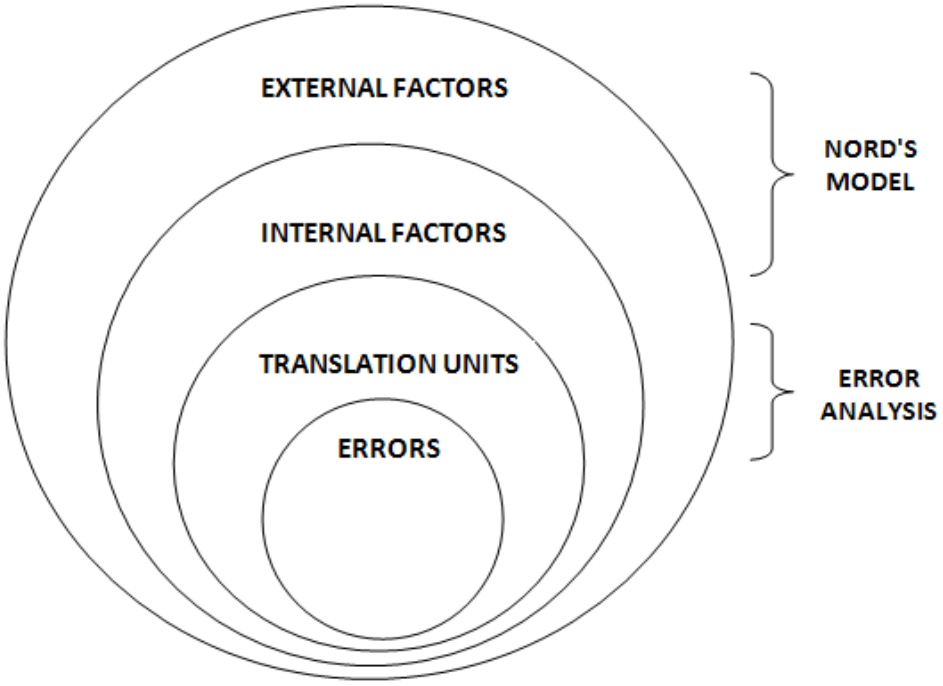
The translators were given clear instructions together with a source text which contained, primarily, information about the source (but not a concrete title of the book – to minimize the risk of copying), the target audience, and, secondly, a brief explanation of the Risk Management concept designed by Anthony Pym (2004). The entire text of the instructions can be found in the appendices (Appendix III). The reason for incorporating two groups of translators with a different level of translator competence translating the same text is explained later in the thesis (Ch. 3.2). None of the translators was asked to translate a particular text more than once.

The result of such experiment with repeated or chain translation are 14 texts, including the original ones.

2.2 Analysis Methodology

The analysis itself is composed of four parts and it moves from surface to core. The first two parts, the analysis of external and internal factors, are based on Christiane Nord's model of text analysis in translation (1991). The other two parts then combine several approaches to mistakes in translation. Firstly, the translation units of all the final TTs are being examined for language and translation errors and compared to the STs. Secondly, the translation errors connected with the problem of equivalence are presented together with the solutions from all TTs, and classified as directional or natural equivalents according to Anthony Pym's definition (2010). The entire analysis with all its parts is illustrated in Figure 3.

Figure 3: Individual Parts of the Analysis



3 Theoretical Foundations

The most challenging task, when trying to describe the changes emerging in repeatedly translated texts, is to find an appropriate method. Moreover, translation studies are a relatively new field of study, still developing, without any strict borders separating it from other disciplines (e.g. linguistics). In addition, the problem of assessing translation quality objectively does not seem to have any clear cut solution. As Hatim and Mason (1997) say, "The assessment of translation performance is an activity which, despite being widespread, is under-researched and under-discussed" (p. 199). However, the "newborn" nature of the discipline has some advantages, too. For example, most of the sources can be found on the Internet and they can therefore be accessed without much effort or delay. The fact facilitates further research of various aspects of translation. The present thesis has taken advantage of the Internet sources and some relevant recent studies on translation quality assessment (TQA) will be presented further in this chapter.

3.1 Translation Quality Assessment

The original idea was to design a system according to which a reviewer could objectively, effectively, and easily describe changes emerging during (repeated) translation, or, at least, to name the aspects worth attention during such procedure. However, many of such systems have already been designed by various scholars for a variety of purposes. Some scholars worked mostly with students (e.g. Waddington 2001, Nord 1991, House 1997, etc.), and others with professionals (e.g. Williams 1989, etc). Some of the models are qualitative (Reiss and Vermeer 1984, Jean Darbelnet 1977, etc.) and others quantitative (Waddington 2001, etc.), and some try to combine both (Williams 2001, etc.). Therefore, the author decided to focus on the existing approaches (instead of designing a new one), and tries to find the most appropriate one for the purpose of the thesis since its aim is mainly to describe, not so much to evaluate or judge. Later, some of the approaches will be named and their possible advantages and disadvantages will be addressed.

But firstly, it is necessary to define what is meant by translation quality assessment (TQA). There exist many approaches to the problem: anecdotal and subjective including neo-hermeneutic approaches, response-oriented (and psycholinguistic) approaches, and text-based approaches (Baker & Saldanha, 1998, p. 222). It seems that the most objective one is still the text-based approach because it

presents a clear set of rules according to which a translation should be assessed, and, moreover, it takes into account the target text skopos (function). Therefore, the thesis focuses on the text-based approaches to TQA although the other ones are not less interesting or not worth exploring. The only reason is objectivity and the text type of the selected texts (scientific prose style).

3.1.1 Christiane Nord's Model

After extensive research, the conclusion has been made that Nord's model of text analysis in translation, including also many implications to TQA, is a holistic one since it, in many ways, overlaps with other approaches included in the research, and therefore the most appropriate one for the purposes of the present thesis. Her model is not restricted to any specific text type, it does not contain any references to specific characteristics of source or target languages, it is independent of the translator level of competence, and it is valid for both directions. Given the qualitative nature of the model, it has been supplemented by an error analysis to provide the thesis with a slightly more quantitative point of view. Such decision can be supported by e.g. Malcolm William's view (2001), according to which both the quantitative and non-quantitative approaches alone suffer from some major shortcomings and, therefore, they should be combined rather than used separately (p. 326).

This chapter will further provide an explanation of the ways in which Nord's approach to TQA overlaps with some of the others. Her approach itself will then be fully explained in the next chapter (Ch. 4). Just a short characteristic: Nord's model of text analysis in translation consists of extratextual and intratextual factors which should be analysed both in a source and a target text and, consequently, compared.

3.1.2 Malcolm Williams's Model

The first of the approaches to be pointed out is the Argumentation Theory designed by Malcolm Williams (2001). As it was mentioned before (Ch. 3.1), the Argumentation Theory attempts to combine a non-qualitative and a qualitative approach to TQA. The author himself states that "whatever the speciality or purpose, a translation must reproduce the argument structure of ST to meet the minimum criteria of adequacy" (Williams, 2001, p. 336). He then names the specific parts of an argument: claim/discovery, grounds, warrant, backing, qualifier/modalizer, and rebuttal/exception. According to Williams, every ST should be analysed with respect to those categories (whether they are present or not) and compared to the TT. The quantitative dimension

of the theory rests in the number of arguments correctly or incorrectly rendered by a translator, and the qualitative one in analysing the arguments and dividing them into smaller components.

This approach, nonetheless, has evident drawbacks – it is rather a macrostructual analysis (disregarding the micro level), and not every text must inevitably contain an argument (or such an argument on which the theory can be applied). Further, as the Routledge Encyclopaedia of Translation Studies argues "he [Malcolm Williams] totally disregards the context- and culture-boundness of texts" (Baker & Saldanha, 1998, p. 223).

The same scholar also explores the assessment of professional translations and the accompanying error analysis (more on the subject can be found later in the thesis – Ch. 6.3 and 6.4) in one of his earlier works (1989). Apart from the error analysis and models as e.g. Sical III, he also presents a list of extratextual factors which play specific role in assessing a translation. However, some of them are more relevant for commercial practice than for a scientific study (e.g. deadline). The list of the extratextual factors follows (with Nord's equivalents in parentheses): purpose or end use (intention, motive, and text function), distribution (medium), customer (sender), deadline, source text (the difficulty of a translation task also mentioned by Nord but not included in the thesis), end use and acceptability (recipient, presuppositions, medium).

3.1.3 Reiss and Vermeer's Model

Another theory exploring TQA was elaborated by Reiss and Vermeer (1984). According to their functional theory, skopos (i.e. the purpose of translation) is the most important aspect. What is, subsequently, taken as a yardstick for TQA is the way a translated text was adapted to a target language and target culture norms. This approach seems to be in compliance with the Nord's one since the author also considers it functional and does not forget to mention the importance of the skopos, too. Still, the Reiss and Vermeer's approach almost disregards the role of a source text in translation and focuses solely on its result in the form of a target text. The author of the thesis would rather agree with Christiane Nord (who takes into account both the ST and the TT) and, again, the Routledge Encyclopaedia of Translation Studies which says, "By its very nature, translation is simultaneously bound to the source text and to the presuppositions and conditions governing its reception in the target linguistic and cultural system" (Baker & Saldanha, 1998, p. 224).

3.1.4 Jean Darbelnet's Model

Another scholar addressing the TQA problem is Jean Darbelnet (1977). He identifies nine parameters important for any translation assessment. The list of the parameters, supplemented by a corresponding part of the present analysis, in parentheses (to illustrate the overlap), follows: accuracy of individual translation units (error analysis), accuracy of translation as a whole (text function), idiomaticity (lexic), correctness of target language (error analysis, medium), tone (intention, sender), cultural differences (recipient, presuppositions), literary and other artistic allusions (not particularly relevant for technical texts), implicit intentions of author (author, motive, intention), adaptation to end user (recipient). It is, again, an example of a non-quantitative approach to TQA.

3.1.5 Christopher Waddington's Model

Further, Christopher Waddington also explores TQA in his work Different Methods of Evaluating Translations (2001) in which he compares four different methods used at various universities around the globe. These methods are quantitative error analyses (some of them are also combined with a holistic approach) trying to provide an objective evaluation of students' translations. Some of the methods are discussed later in the thesis together with other approaches to errors in translation (Ch. 6.4).

What is, however, worth mentioning at this point is the fact that one of the methods "takes into account the negative effect of errors on the overall quality of the translations" (Waddington, 2001, p. 314). In other words, the more words an error affects, the more serious it is. He then presents a scale with the extent of a negative effect on words in a text and with a penalty for it (e.g. 1-5 words = -2 points; 6-20 words = -3 points, etc.) This approach, nonetheless, does not fully exclude subjectivity from the assessment – different reviewers may evaluate a mistake differently.

3.1.6 Jamal Al-Qinai's Model

Last but not least, Jamal Al-Qinai (2000) endeavours to "develop an empirical model for QA [TQA] based on objective parameters of textual typology, formal correspondence, thematic coherence, reference cohesion, pragmatic equivalence and lexico-syntactic properties" (p. 497). The scholar elaborated a list of concrete parameters according to which the ST and TT relative match should be tested. These were raised by Newmark (1988), Hatim and Mason (1990), House (1997) and others. Al-Qinai's model is the most similar one to the Nord's – it strives to be holistic. But still, Nord presents an approach which does not leave any of the possible aspects of

TQA unattended. The list of Al-Qinai's parameters follows together with an appropriate part of the model used in the present thesis (Al-Qinai, 2000, p. 499):

Figure 4: Comparison of Al-Qinai's and Nord's Model

Al-Qinai's model of TQA	**Present analysis**
Textual Typology and Tenor: linguistic and narrative structure of ST and TT, textual function (e.g. didactic, informative, instructional, persuasive, evocative, etc.)	text function, content, lexis
Formal Correspondence: overall textual volume and arrangement, paragraph division, punctuation, reproduction of headings, quotation, motos, logos… etc.	text composition, medium, non-verbal elements, suprasegmental features
Coherence of Thematic Structure: degree of referential compatibility and thematic symmetry.	subject matter, presuppositions
Cohesion: reference (co-reference, proforms, anaphora, cataphora), substitution, ellipsis, deixis and conjunctions.	content
Text-Pragmatic (Dynamic) Equivalence: degree of proximity of TT to the intended effect of ST (i.e. fulfillment or violation of reader expectations) and the illocutionary function of ST and TT.	intention, presuppositions, recipient, motive
Lexical Properties (Register): jargon, idioms, loanwords, catch phrases, collocations, paraphrases, connotations and emotive aspects of lexical meaning.	lexis
Grammatical/ Syntactic Equivalence: word order, sentence structure, cleaving, number, gender and person (agreement), modality, tense and aspect.	sentence structure, content

3.2 Translator Competence

Translator competence is defined by Anthony Pym (2011) as "the knowledge, skills and attitudes necessary to become a translator" (p. 78). According to him, the competence consists of two components: declarative knowledge (knowing that) and operational knowledge (knowing how). He also states that the term can be substituted by more specific expressions: "skill, knowledge, and disposition, with degrees of expertise operative within all three" (Pym, 2011, p. 78). Linguistics, on the other hand, usually defines the competence as a set of rules that underlie performance. To provide another example, Stansfield (1992) says that competence should be divided into two different skills: accuracy (of the transfer of ST content into the TT) and expression (quality of translator's expression). Other theories concerning translator competence include various components, for instance knowledge of language, knowledge of translation technologies, ability to apply translation strategies, confidence, speed, etc.

In the present analysis, the translator competence was no explored. The texts were translated by two different groups of translators described hereinbefore (Ch. 2.1). The reason for not exploring the translator competence in the thesis was, apart from its limited space, that the competence within a group is supposedly equal. All of the members should have almost the same chance to translate a text correctly. The professional part of the translators then should, in all probability, have more experience in translating technical texts (since the agencies have appointed particularly them for the translation of such texts). One of the texts was translated by both the students and the professionals due to the risk that the students' TT could have been too "damaged" at the end of the process of repeated translation. In that case, the professionals' TT would serve as a safety - if it was also of very low quality, then there are probably some processes having a negative effect on repeatedly translated texts; if it, on the contrary, was a TT of acceptable quality, then the problem of students' failure may lie in their level of translator competence.

3.3 Risk Analysis

Risk analysis, a concept elaborated by Anthony Pym (2004), is closely connected to translation quality assessment. Pym states that mistranslation of some elements (i.e. translation units) bears a higher degree of risk than mistranslation of others. To determine the high risk elements, the translator has to analyse what the translation is supposed to do. Consequently, the translator should devote more effort to the high risk elements and not linger much with the low risk ones. The concept is reflected in the error analysis later in the thesis (Ch. 6) as the mistranslation of a high risk element would probably cause a major error, whereas the same case with a low risk element a minor error.

3.4 Style

With regard to the nature of the analysis, it is necessary to say a few words about the style characterising the analysed texts – scientific prose style (a term used by Galperin 1971 or Urbanová 2008). Such texts are usually written monologues and they are rarely intended for oral presentation, therefore they tend to be more condensed (e.g. semi-predicative constructions, gerunds, present/past participles, nominal expression, etc.) and information contained is more factual, objective, compact, tight and sententious than in a speech (Urbanová, 2008, Ch. 7 and Knittlová, 2000, p 136-158). Urbanová

(2008) also adds that linear modification, clear sentence boundaries (full stop, comma, conjunctions, capital letters, etc.), surveyability and preservability characterise the grammar and lay-out of all written texts, including the technical ones (Ch. 7). Moreover, written texts usually do not allow for any feedback from their recipients. Consequently, both the content and form of the message being conveyed have to be exhaustive (various connectors, reference and demonstrative expressions together with subordinating conjunctions help to build a hierarchy) (Knittlová, 2000, p. 136-158).

A typical attribute of the English style is matter-of-factness (Urbanová, 2002, p. 48). Authors writing in scientific prose style generally verbalize sophisticated topics (connected with abstract expressions, loan-words, complex sentences, terminology, higher level of cohesion, etc.) as a subject-matter in their texts (Urbanová, 2008, p. 22), which commonly perform a referential function (meaning they typically describe certain things or phenomena rather than express feelings or make an artistic impression). The language is generally formal (much like the relationship between the author and the recipient - tenor) and the level of expressiveness, given by the occurrence of author's subjective opinions, should be low. Apart from the formality, technical texts are usually, not exclusively, impersonal, which is presented in the form of passive voice or third person noun phrases (Leech et al., 1982, p. 146). In Czech, on the other hand, authors often choose to address their audience and they often include themselves into the addressing (e.g. *nacházíme, nalézáme*) in an effort to build a relationship with their readers, yet still a formal one.

Dagmar Knittlová (2000, p. 136-158) presents several remarks on the topic some of which have not been mentioned so far. The syntax of the scientific prose style, according to her, is quite simple and stereotypical (not meaning simple sentences): objective word order, condensed sentences, objective, impersonal sentential structures. Regarding the lexis, the texts usually contain many nouns, adjectives, specific terms, unambiguous (not necessarily univocal) terms; the lexis is usually quite stereotypical with a high repetition rate. Marie Čechová (2003) emphasizes the greater numbers of nouns, whole noun phrases and phrases containing a verb and a noun (*zabývat se výrobou* vs. *vyrábět*) found in Czech technical texts (p. 187). Finally, I. R. Galperin (1971) adds to the style characteristics that it tries to "devoid of any individuality" (p. 319).

In conclusion, apart from the aforementioned differences between the Czech and English scientific prose styles, they mainly differ in their orientation. English technical

texts are oriented towards the reader and the author is responsible for the message conveyance, whereas Czech technical texts focus primarily on the topic and the reader is assigned the responsibility of its decoding (Čmejrková et al. 1999 and Chamonikolasová 2005). It thus influences many aspects of the texts, for instance Czech authors usually form longer sentences containing many details. English authors, on the other hand, use more short sentences. Likewise, according to Chamonikolasová (2005), "Anglophone authors tend to use straightforward lexical and syntactic structures and do not avoid repetition," while Czech authors "prefer more complex lexical and syntactic structures" and "search for synonyms" (p. 82).

4 Christiane Nord's Model

After determining the most appropriate and holistic approach to TQA which, as it has been previously shown (Ch. 3), quite often overlaps with other approaches, this chapter will deal with the methodology of the two first parts of the analysis – the analysis of external and internal factors. Nord's approach, which is explained in her book Text Analysis in Translation (1991), was not primarily designed for translation quality assessment. This model should help teachers in training students of translation. Such training, however, should not try to avoid assessing or grading students' translations. Therefore, the model of the text analysis in translation can be used as a clue or ground for translation assessment which endeavours to be more than mere subjective criticism (Nord, 1991, p. 163). In other words, the model tries to "exclude intuition from TQA and teaching" (Nord, 1991, p. 2).

Another quality of the model is its functionality, in the sense suggested by Reiss (as cited in Koller, 1971) and, likewise, in accordance with the Skopos theory (Reiss & Vermeer, 1984). Nord (1991) even considers functionality "the most important criterion for a translation" (p. 28), meaning that no matter how logical it may seem at first, it is neither a ST or its effect on a recipient nor a function assigned to it by the author that "operates the translation process". The deciding factor here is, conversely, a function or skopos of a TT which should comply with initiator's needs (Nord, 1991, p. 9). Similarly, a text which is obviously incoherent and incohesive may still be textual (i.e. make sense) in some communicative situations (Nord, 1991, p. 35). For instance, a shopping list with various products and their quantity may also be a part of a poem, etc. Nord (1991) adds that, "one possible TT function may be to 'imitate' the effects of the original ST reception" (p. 5). According to her, "translation should fulfil certain 'translation instructions' [...] explicit description of the prospective target situation," in other words, the skopos of a target text (Nord, 1991, p. 8). With respect to this theory, a translation should not break any conventions assigned to a text type in a target culture.

In the present thesis, texts were repeatedly translated between two cultural environments – Czech and English – and the final TTs are written in the same language as the original texts. What will thus be analysed is, in fact, how the final TTs differ from the ST profiles determined at the beginning of the analysis. It hence appears that the present analysis slightly differs from Nord's model to the extent that there is no need to

elaborate any TT profiles, since the STs and the final TTs are presented in the same language and should meet the same cultural norms. Accordingly, the aim of the analysis is mainly to determine all possible deviations from the initial STs.

Further, although Nord (1991) states that it is not necessary to perform the whole text analysis before every single translation task (p. 81), as it may be very time consuming and contra-productive, for the purposes of the thesis, the analysis will be conducted in its entirety to give a holistic view on the texts and the method as well. Nevertheless, the author of the thesis is in broad agreement with the model author that, in practical application, for some text types "the analysis will have to focus on certain specific intratextual aspects, whereas in others these aspects will be conventional and, therefore, predicable" (Nord, 1991, p. 81). The model seems to be quite flexible, which is also supported by its independence of a source and a target language and even the translator level of competence; it works both directions, too (Nord, 1991, p. 1).

At the very core of the analysis, there lies the idea that a translator and subsequently a reviewer should, firstly, create a ST profile, secondly a TT profile, and finally compare both. The translator's task is then to "place a cultural filter between ST and TT" (Nord, 1991, p. 16). As simple as it may sound, the model is highly sophisticated and it can also be summarised as follows: "In a translation-oriented analysis, we will first analyse these factors [the communicative situation and the participants in the communicative act] and their function in the ST situation and then compare them with the corresponding factors in the (prospective) TT situation [...]" (Nord, 1991, p. 15). In this respect, Nord's model corresponds with the model elaborated by another translation scholar, Juliane House (1997): "By using situational dimensions for opening up the source text, a particular text profile is obtained for the source text. This profile which characterizes the function of the text is then the norm against which the quality of the translation text is to be measured [...]" (p. 42). However, it seems that House lays more emphasis on the ST, whereas Nord on the TT function. Last but not least, one more explanation of Nord's approach should be mentioned: "Communicative function [...] determines the strategies of text production. [...] From a retrospective angle, he [the translator] tries in his ST analysis to verify his expectation regarding text function, which has been built up by situational clues [...]. From a prospective angle, [...] he has to check each ST element as to whether it can fulfil the intended TT function [...]" (Nord, 1991, p. 17). Likewise, the translator has to

bear in mind that a ST may have more than one function ("polyfunctionality of texts" Nord, 1991, p. 21), which should be reflected in the corresponding TT.

Before any further explanation of the model is given, it appears useful to explain some terms used within the analysis in greater detail to avoid ambiguity:

- **Initiator** is the person who initiates the translation; someone "approaching a translator because he needs a certain target text" (Nord, 1991, p. 4).
- **Text sender** can be defined as a person who "transmits a text in order to send a certain message" (Nord, 1991, p. 5).
- **Text producer** is the person who "actually produces the text". If the text producer and the text sender are represented by the same person, he or she is called an "author" (Nord, 1991, p. 5).
- **Text type**, according to Nord (1991), is "a distinctive configuration of relational dominances obtaining between or among elements of:
  - **surface text,**
  - **textual world,**
  - **stored knowledge patterns,**
  - **situation of occurrence**" (p.18).

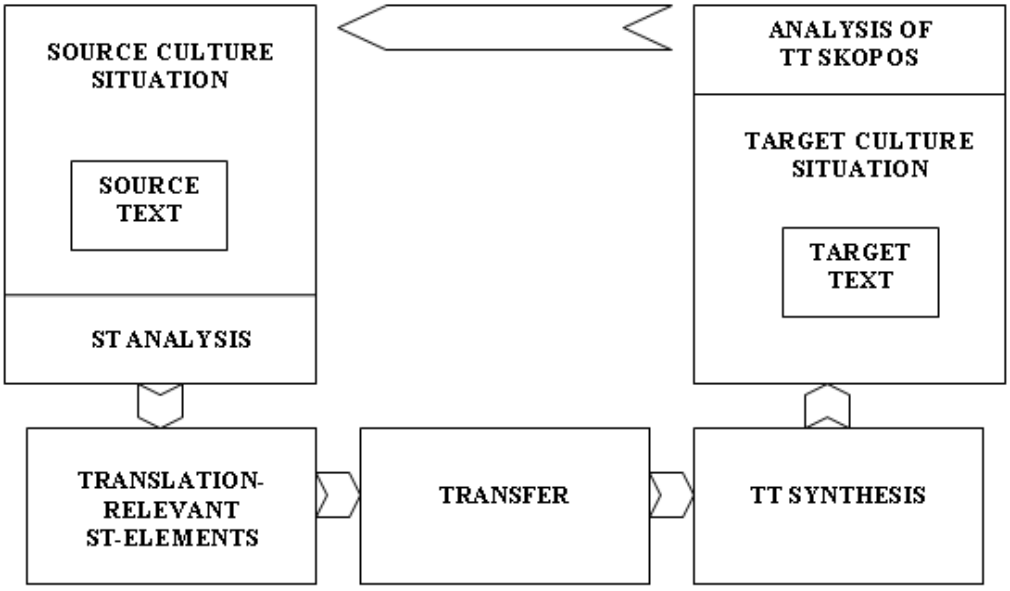
  For a detailed commentary on the text type of the texts analysed in the thesis, see the previous chapter (Ch. 3.4). The text type is particularly important for the translation process because it determines the conventions which should be obeyed both in ST and TT. Or, on the other hand, if a ST author decides to deliberately break some of the conventions, the translator must take this fact into account when producing a corresponding TT. It ought to be said that such conventions or even norms, of course, differ from culture to culture, and they undergo minor or major changes over time (Nord, 1991, p. 19). Furthermore, the text type conventions are even more important in the case of non-literary texts because recipients have certain, more or less specific, expectations about both extratextual and intratextual factors. Any undesired deviation from such conventions may lead to ambiguity.
- **Equivalence** is "the greatest possible correspondence between source text and target text" (Nord, 1991, p. 22). Translators are constantly looking for balance between "fidelity (being faithful) and servility (being too faithful)

on the other hand, and liberty (being free) and libertinage (being too free, i.e. adapting or 'even' paraphrasing) on the other [...]" (p. 22).

- **Intertextual coherence** simply means that a TT should be coherent with other texts of the same text type in a target culture as the ST is in the source culture. Likewise, the ST should be coherent with the TT. However, "[...] in a skopos-oriented translation the observance of the skopos is performed prior to intertextual coherence with the source text" (Nord, 1991, p. 24).

A particularly important aspect of Nord's model (1991) is its looping nature – with every step the translator takes he has to "look back" on the facts that have arisen from the ST analysis and their implications for a prospective TT (p. 35). He constantly goes back and forth to choose the most appropriate solutions and not to miss any important factors, which is illustrated in the following looping model of the translation process in Figure 5 taken from Christiane Nord (1991, p. 34):

Figure 5: Looping Model of the Translation Process



It is obvious from Figure 5 that the looping model can be divided into several steps:

1. TT skopos analysis
2. Source text analysis
    a. Determining whether the source text is compatible with the requirements for the prospective target text.
    b. Detailed analysis focused on the elements of particular importance for TT production.
3. Final structuring of the target text

The translator thus moves backwards from the TT to the ST and back to the TT which closes the circle. Nord (1991) says, "If the translator has succeeded in producing a functional text conforming to the initiator's needs, the target text will be congruent with the TT skopos" (p. 33). As regards the second part of the second step in the translation process, it seems to bear some resemblance to Pym's concept of risk management (also risk analysis) (2004), since he also admits that not all of the ST elements should be treated with the same attention and precision: "Some elements are high risk, others are low risk [...] work hard on the high-risk elements, and do not work too hard on the low-risk elements" (p. 2).

Not only does the model try to be as universal as possible, but it also attempts to include all possible aspects which may have some effect on the translation process, translator's decisions, and, finally, the target text. Therefore, a more detailed and practical explanation of such aspects should follow.

Extratextual (or external) factors, analysed by the translator right before reading a text, are the starting point of the analysis. They help the translator to determine a source text function. Translator's task is to observe a ST situation as both a ST recipient and the translator build up certain expectations about the intratextual factors of a text which will hopefully be verified by further reading. The translator should particularly be interested in the effect the text has on the ST recipient (Nord, 1991, p. 37). The set of extratextual factors follows: sender, intention, recipient, medium, place, time, motive, and text function.

After exploring the extratextual factors, the translator or reviewer should continue with the intratextual (internal) ones. These, on the contrary, relate to a text itself and include even non-verbal elements (Nord, 1991, p. 35, 36). Among the intratextual factors are: content, subject manner, presuppositions, text composition, non-verbal elements, lexis, sentence structure, and suprasegmental features. Taking into account the looping nature of the translation process, the sequence in which the translator observes each extratextual or intratextual factor is irrelevant. The key term determining the relations between the factors is interdependence (Nord, 1991). Each of the factors can and should give the translator a clue about some of the others (e.g. if an author lived between 1900 and 1958, the text was probably published at that time, if not later – this shows the interdependence of the author and time).

4.1 External Factors

4.1.1 Sender

"The sender of a text is the person (or institution, etc.) who uses the text in order to convey a certain message to somebody else and/or to produce a certain effect, whereas the text producer writes the text according to the instructions of the sender, and complies with the rules and norms of text production valid in the respective language and culture" (Nord, 1991, p. 43). As it has been said before, the categories of sender and text producer often overlap. The translator then finds himself in a situation comparable to the one of the text producer. He has to produce a text having the same effect on TT recipients as the ST had on ST recipients, and he will exert himself to produce a text which would be in compliance both with the ST and the TT norms (unless there exist other instructions from the translation initiator). This, however, is not to discredit translator's creativity in translation.

4.1.2 Intention

Intention determines structuring of a text (what to mention and what to omit) and its form (e.g. the choice of a TT text type, non-verbal elements, etc.). It is the sender who defines the intention, and the translator should exert himself to adhere to it when creating a TT. Christiane Nord (1991) adds, "At the same time, the particular organization of a text marks the text type and is a pre-signal which tells the recipient in which function he is expected to use the text" (p. 48). The category of intention is especially important for literary texts (since a non-literary text, namely a technical one, tends to be as clear as possible, not ambiguous, without any hidden meanings), which is not the case of the present analysis.

4.1.3 Recipient

At this stage of the analysis, a text recipient is in question; later (Ch. 5.2.2), it will particularly be the ST recipient followed by the TT recipient. These two are, according to Nord (1991), different from each other at least in two aspects – cultural background and linguistic community (p. 52). Though, in the present thesis, both the ST recipient and the final TT recipient share the same background and community. However, it is still vital to take their characteristics into account when translating. Adjustments concerning the TT recipient should be found only in the texts translated into English.

4.1.4 Medium

This extratextual factor can be defined as a "medium or vehicle which conveys the text to the reader" (Nord, 1991, p. 56). On the basis of the medium through which the message comes to its recipient, he builds certain presuppositions (or expectations) which are based on his experience with the medium (e.g. offensive language certainly has a different effect in a film dubbing, or even in subtitles, and in a textbook). The translator should thus bear in mind the prospective recipient's presuppositions.

4.1.5 Place

The dimension of place can be ambiguous because not everyone shares the same image when thinking about the term. On account of this, it ought to be said that the place stands not only for the place of production, but also for the place of reception (Nord, 1991, p. 60). The place factor is, undoubtedly, closely connected to the medium since a person would not search for a book in a cinema theatre. Likewise, a close connection can be found between the place and time because of e.g. the political influence on literature at a certain time. When considering the place, the translator should account for linguistic aspects as well as cultural and political conditions. The dimension of place grows in importance when there exist more language varieties used in different regions of the same language culture (Nord, 1991, p. 61).

4.1.6 Time

The time dimension is important for the text analysis performed before every translation for two reasons, the first of which is generally applicable on literary texts rather than technical ones. Firstly, summarised by Nord (1991), "Certain text types are linked to a particular period (e.g. oracles and epic poems as opposed to weather reports and television plays), and, of course, text-type conventions also undergo change" (p. 63). Secondly, the translator should consider, whether the information given in the source text is still valid (Nord, 1991, p. 64). If so, it can be considered a "modern" piece of work (e.g. the probability that the text will contain more than just a few adverbial participles, in case of Czech, is quite low) written by a "contemporary" author, and its translation can thus, according to Popovič (1981), be regarded a synchronous one.

The translator should also bear in mind that, especially with technical texts, the field terminology is constantly undergoing minor or major changes (e.g. computer science). It goes hand in hand with development as it attempts to name new inventions, events, etc.

4.1.7 Motive

The category of motive represents the reasons why a sender decided to establish communication with a recipient/s. This also includes the occasion for which the text was produced (Nord, 1991, p. 67). The motive may signal conventions that will "guide the recipient's expectations" (Nord, 1991, p. 68).

4.1.8 Text Function

Assumingly, the most significant of all the external factors, the text function, is the key for an acceptable translation as "it is only by analysing the ST function that the translator can decide which TT function(s) will be compatible with the given ST" (Nord, 1991, p. 72). Yet, it is still the recipient who completes a particular communicative situation and thus defines the text function (Nord 1991, p. 16). This means that the only limitation to the number of possible text functions is the number of recipients. The text function can be described, according to Nord (1991), as the communicative function "which a text fulfils in its concrete situation of production/reception" (p. 70). Two different types of translation – documentary and instrumental (Nord, 1991, p.72) – may serve as an example of the connection between the text function and a translation. The more frequent instrumental translation represents conveyance of a message from a ST author to a TT recipient directly, whereas the documentary translation is only a document of the communication between a ST author and a ST recipient (which bears some resemblance to House's [1981] overt and covert translation).

4.2 Internal Factors

4.2.1 Subject Matter

Subject matter, in other words the main topic of a text, is vital for the text analysis for several reasons. First, if the analysis proves that there is a subject which dominates a text then the whole text is, in all probability, coherent (Nord, 1991, p. 85).

Second, the subject matter can be embedded in a cultural context and indicate some of the readers' presuppositions (Popovič, 1981). If so, the translator has to take the fact into account.

Third, as little as the subject matter can give the translator a hint about the content and terminology – the two deciding factors of whether he possesses the expert knowledge to understand and translate a text (Nord, 1991, p. 86). It can also give him an

initial clue about the amount of research he is about to conduct (in case he lacks specialised knowledge), and whether it is worth conducting (since a good translator should be aware of his own professional limits). In the case of students' translations, the ability to perform detailed research will probably be more relevant than possessing expert knowledge, even though the texts were selected with regards to the students' level of competence, and they do not differ much from the texts which may be, at some point, presented to them in their future professional careers. Really the key ability here seems to be the risk analysis (Pym, 2004) – to decide which translation units bear a higher degree of risk (as discussed in Ch. 3.3).

Fourth, from the subject matter analysis, the translator may gain information about the role (function) of the headline and sub-headlines which differs culture from culture (Nord, 1991, p. 86).

Finally, "the elicitation of the subject matter occasionally yields some information about certain extratextual factors (e.g., sender, time, text function), where these have not already been ascertained by external analysis" (Nord, 1991, p. 86). Further, the expectations concerning the subject matter developed in the course of the external factors analysis may be confirmed or adjusted.

4.2.2 Content

In most cases, being a translator presupposes a good command of a source language and a target langue as well as knowledge of the rules and norms governing text production. This leaves little space for possible misunderstanding caused by ST (content) comprehension. Still, Christiane Nord provides some useful guidelines for determining the precise content of a text; mostly on the level of lexical items. To start with, she defines content as "the reference of the text to objects and phenomena in an extralinguistic reality" (Nord, 1991, p. 90), and adds that such reference is generally expressed by the semantics of the lexical and grammatical structures. These structures work well together (ideally), complement each other and significantly contribute to the coherence of the text (and also the coherence of the text and other texts in the same language culture). By the lexical and grammatical structures, the author means: linking devices (including anaphora, cataphoric reference, substitution, recurrence, paraphrase, etc.), other logical connections, theme-rheme relationship, functional sentence perspective, words and phrases, sentence patterns, tense, mood, etc. (Nord, 1991, p. 91). This corresponds (not fully overlaps, for it contains more than just a mere analysis of

cohesion) with the concept of cohesion presented by Halliday and Hasan (1976) as it takes into account all the five sources of cohesion suggested by the scholars: cohesion through reference (anaphoric reference, cataphoric reference...), substitution, ellipsis, conjunction, and lexical items (repetition, hyponyms and hypernyms...).

At least two more things ought to be mentioned when describing the category of content – the denotative vs. connotative meaning of a word and the "internal situation" of a text. Nord (1991) very clearly states, "The amount of information verbalized in a text includes not only denotative but also connotative (or 'secondary') meaning, i.e. the information expressed by a language element by virtue of its affiliation to a certain linguistic code (stylistic levels, registers, functional style, regional and social dialects, etc.)" (p. 92). With respect to this fact, the translator should read and understand a source text and then create the target text accordingly.

Last but not least, the information contained in a text can be either "factual" (based on reality – the one that both the sender and the recipient can agree on) or "fictional" (referring to a fictional world invented by the author, and therefore separated from the reality of the communicative act) (Nord, 1991, p. 93).

This is assumingly the first factor which may lay some foundations for a quantitative analysis of translation quality (rather than qualitative, as it was so far). Although, these are only clues since the fact that e.g. a target text holds the very same number of particular verb forms as the source text, or that the translator managed to use exactly the same variety of conjunctions, does not ensure a high standard of translation.

4.2.3 Presuppositions

Pragmatic presuppositions are those "implicitly assumed by the speaker, who takes it for granted that this will also be the case with the listener" (Nord, 1991, p. 95); such presuppositions usually refer to objects and phenomena of the source culture (p. 96). Problems arise if the thesis does not work. For example, in cases when the target reader is not fully aware of the source culture aspects presented in the ST and transferred into the TT. Therefore, the translator may want to "adjust the level of explicitness to the (assumed) general background knowledge of the intended TT recipient" (Nord, 1991, p. 98). Nord also suggests that he will take advantage of the translation procedures of 'expansion' or 'reduction'.

It is vital, to mention the problem of redundancy, too. The main aim of the redundancy is to assist comprehension by repeated verbalization (e.g. explanation,

repetition, paraphrase, summary, tautology, etc.). Since both texts analysed in the present thesis are technical ones written by experts for experts or almost experts, the redundancy should be minimal.

4.2.4 Text Composition

What Nord means by the text composition is, in short, the structuring of a text; whether it consists of several shorter texts or whether it is a part of a bigger text, etc. She builds upon Thiel's aspects of text composition: "She [Thiel] suggests that the text has an informational macrostructure (i.e. composition and order of information units) consisting of a number of microstructures" (Nord, 1991, p. 100); where the macrostructure is marked by chapters and paragraphs, and the microstructure by syntactic structures, lexical devices, or suprasegmental features. Both the micro and macrostructure are of great importance for the translation-oriented analysis because, firstly, a text can be comprised of smaller text segments with different functions which may thus require different translation strategies. Secondly, the beginning and the end of a text may play special part in its comprehension, and they thus deserve to be analysed in greater detail (e.g. do they somehow guide the reception or change the effect of the whole text?). Thirdly, some text types may be subject to culture-specific conventions concerning text composition (e.g. a letter). Fourthly, if a text is very complex or incoherent in its nature, the analysis of microstructure can yield some information about the subject matter (Nord, 1991, p. 101).

4.2.5 Non-verbal Elements

Non-verbal elements are various signs which do not belong to any linguistic code and which are used as supplements to them. By using such signs, the author aims to illustrate, disambiguate, or even intensify the message contained in a text or a discourse (Nord, 1991, p. 108). Among these are, as for the texts, photos, illustrations, emblems, special types of print, etc. The translator's task is not only to find such signs, but also to reveal their specific function within a particular text. The non-verbal elements should not be mistaken for suprasegmental features (punctuation, capitalisation...), discussed later in the chapter (Ch. 4.2.8).

4.2.6 Lexis

The category of lexis is quite large. It may refer to the affiliation of a word to stylistic levels and registers, word formation, connotations, rhetorical figures (metaphors,

repetition of lexical element, metonymy, metaphor), parts of speech, morphological aspects (suffixes, prefixes, compositions, acronyms, abbreviations, etc.), collocations, idioms, addressing, selection of words (with respect to the sender's intention, time, place, medium, occasion...), degree of originality (words invented by the author, phrases coined by him, intentional violation of norms), etc. Nord (1991) also states that "the choice of lexis in a particular text is determined by both extratextual and intratextual factors" (p. 112), and Crystal and Davy (1969) add, "In any text, the stylistically significant characteristics of lexis clearly reflect the extratextual factors of the situation in which the text is used, including the participants using it for communication" (p. 81).

4.2.7 Sentence Structure

Is the sentence structure mainly paratactic or hypotactic? Are the sentences simple or complex? Are there any deviations from functional sentence perspective? Does the text flow with syntactic figures of speech such as aposiopesis[3] (which may indicate certain presuppositions), parallelism, chiasm, rhetorical question, parenthesis, ellipsis, etc. (Nord, 1991, p. 118-120)? What is their function in the text? Such and other questions should be asked and hopefully answered during this part of the analysis. The extratextual factors may contribute to the image about the sentence structure which the translator builds throughout the course of the analysis in a way that e.g. the author's intention may be realized through various syntactic figures. In other words, as soon as the intention is analysed, it may indicate the presumable sentence structure. Likewise, in all probability, the more complex the subject matter, the more complex the sentence structure.

4.2.8 Suprasegmental Features

The author of the model says about suprasegmental features that they "serve to highlight or focus certain parts of the text and to push others to background" (Nord, 1991, p. 80), and adds that they possess both an informative (i.e. denotative) and a stylistics (i.e. connotative) function. Simply said, the suprasegmental features are those which do not fall into any of the previous categories of lexical or syntactical segments, sentences, paragraphs, etc. In writing, they are signalled by e.g. italics, spaced or bold type, quotation marks, dashes, parentheses, underlining, affirmative words (actually, in fact), emphatic evaluations (fantastic, great), clefts (It was John who...), ellipsis, aposiopeses,

[3] „when [...] the speaker breaks off his speech before the sense is completed, in order to aggravate the purpose of his address" (Boyd, 1860, p. 281/282)

asyndetic enumerations (higher tempo), theme-rheme structures (e.g. stress the most important one by putting it at the end), selection of words, word order, onomatopoeia, and so forth (Nord, 1991, p. 120-124). From the above list and from other additional aspects, such as rhythmicity, melody, alliteration, rhyme, and tone, it seems that the suprasegmental features play a bigger role in poems and spoken discourses than in strictly technical texts.

5 Analysis

5.1 Summary of Nord's Model Analysis

Due to the extent of the analysis, three tables (Figure 6, Figure 7, and Figure 8) summarising the findings will unconventionally be presented first (prior to the analysis itself). Each table represents one final TT. Right after the tables (Chapters 5.2 and 5.3), attention will be drawn to those parts of the analysis where there were some problems on the translators' side, or where an example was needed. Such parts are marked with asterisk in the first column of the tables.

Figure 6: Summary of the "History" Text Analysis

HISTORY		
	ST	TT
EXTRATEXTUAL FACTORS		
SENDER	Ing. Jan Fröhlich (supposedly the text producer, too), experienced (more books), monologue	no problems
INTENTION*	referential intention[4], neutral tone, more past verb forms than it is usual for the text type	some of the text type conventions are stronger than in the ST, others are weaker (more simple sentences, informal vocabulary, etc.)
RECIPIENT*	age: 15+; sex: both; education: at least basic school; geographic origin: Czech speaking people; social status: students (secondary school), specialists	Czech title of the book referred to in the text changed to German original title
MEDIUM	published writing, the book may also be used as a secondary school textbook	slight change of layout (bold type, italics, and spaces between paragraphs), still acceptable
PLACE	Czech Republic, Prague; no regional dialects, standard neutral Czech	no problems
TIME	1978 (contemporary), published under the Communist regime – could have been censured	no problems
MOTIVE	to provide an introduction to a book, rather general intended to be read only once	no problems
TEXT FUNCTION	informative (non-literary)	no problems

[4] "inform the recipient about a certain issue" (Nord, 1991, p. 49)

INTRATEXTUAL FACTORS		
SUBJECT MATER	the historical development of roller bearings; thematically coherent; a topic sentence summarising the subject matter at the beginning; not bound to cultural context	no problems
CONTENT*	factual internal situation; scientific prose style; formal register; slightly positive vocabulary; anaphoric references (3), cataphoric references (1), substitution, paraphrase, recurrence; conjunctions: coordinating 17 (14 additive, 3 gradation), subordinating 5; verbs: all indicative mood, majority in 3rd person singular/plural, majority active (15:9), past tense prevails (14:10); the author addresses the audience in 1st person plural	anaphoric references (6), cataphoric references (0); conjunctions: 16 coordinating (14 additive, 0 gradation, 1 adversative, 1 reason), subordinating 5; verbs: majority active (13:11), past tense prevails (19:5), no addressing; more pronouns, some complex sentences cut into simple ones
PRESUPPOSITIONS*	Leonardo da Vinci, Egyptian, pyramid, ISO standards, references to two books, explicitation (the Bronze Age)	missing references to books, German title instead of Czech one, missing references to ISO norms
TEXT COMPOSITION	part of a book (introduction); two embedded references to books; no headline, divided into paragraphs	missing offset at the beginning of every paragraph
NON-VERBAL ELEMENTS	no specific non-verbal elements	no problems
LEXIS*	formal, no figurative speech; low degree of originality; not clear author; addressing (1. p. pl.); objective; some positive vocabulary; references to books, da Vinci; mentioned ISO and ISA standards; dates/years; not limited in space – few abbreviations; a lot of terminology	slightly less formal, missing addressing, less positive vocabulary, missing references to ISO and ISA norms (fewer abbreviations), verb + noun became a verb
SENTENCE STRUCTURE*	sentences 18 (12 simple, 2 complex, 4 complex-compound) clauses 25 (20 independent, 5 dependent); average sentence length: 17,06	sentences 19 (15 simple, 2 complex, 2 complex-compound) clauses 26 (21 independent, 5 dependent); average sentence length: 15; more simple sentences;

		sometimes less condensed
SUPRASEGMENTAL FEATURES*	cleft	no cleft, the sentence was standardised

Figure 7: Summary of the "Welding" Text Analysis - Students

WELDING		
	ST	STT
EXTRATEXTUAL FACTORS		
SENDER	sender: Ing. Svatopluk Černoch; text producer: Ing. Josef Jedlička (explicitly mentioned); monologue	no problems
INTENTION*	referential intention, neutral tone, text type conventions are not broken	one extra imperative, some of the style conventions are weaker (less condensed)
RECIPIENT	age: 20+; sex: both; education: university degree in technical area; geographic origin: Czech speaking people; social status: specialists, students (university)	no problems
MEDIUM	published writing, the book may also be used as a textbook for university students	slight change of layout (bold type, italics, and spaces between paragraphs), still acceptable
PLACE	Czech Republic, Prague; no regional dialects, standard neutral Czech	no problems
TIME	1977 (contemporary), published under the Communist regime – could have been censured	no problems
MOTIVE	to explain and to provide introduction to a chapter	no problems
TEXT FUNCTION	informative and educative (non-literary)	no problems
INTRATEXTUAL FACTORS		
SUBJECT MATTER	welded structures and components; thematically coherent; the subject matter is verbalised in the headline; not bound to cultural context	no problems
CONTENT*	factual internal situation; scientific prose style; formal register; slightly positive vocabulary; anaphoric references (2), substitution, paraphrase, recurrence; conjunctions:	anaphoric references (5), repetition rather than substitution of "*tlumící účinek*"; conjunctions: 17 coordinating (12

	16 coordinating (10 additive, 4 adversative, 2 gradation), 7 subordinating; verbs: indicative mood prevails (1 conditional), majority in 3rd person singular/plural, majority active (15:6), all in present time, the author does not addresses the audience	additive, 2 gradation, 3 adversative), 10 subordinating; verbs: majority active (17:5), present tense prevails (1 future), no addressing, mostly indicative mood (1 conditional, 1 imperative)
PRESUPPOSITIONS*	elasticity modulus, spatial rigidity, bevels, fillet welds, one specification (*stykové, tupé, svary*)	no specification
TEXT COMPOSITION	part of a book (introduction); embedded references to other chapters of the book and a picture; headline; name of the author; two sub-headlines; divided into paragraphs	some paragraphs and headlines are separated by a separate line
NON-VERBAL ELEMENTS	no specific non-verbal elements	no problems
LEXIS*	formal, no figurative speech; low degree of originality; clear author and his education; no addressing; objective; some positive vocabulary; references to previous chapters and pictures; no temporal references; not limited in space – few abbreviations; a lot of terminology	no problems
SENTENCE STRUCTURE*	sentences 12 (7 simple, 1 complex, 4 complex-compound) clauses 22 (13 independent, 9 dependent); average sentence length: 19,25	sentences 12 (8 simple, 1 complex, 3 complex-compound) clauses 22 (13 independent, 9 dependent); average sentence length: 18; one more simple sentence, less condensed
SUPRASEGMENTAL FEATURES	bold headline; author's name, reference to a picture, and sub-headline in italics	the main headline is no longer in bold type, the name of the author and the reference to a picture are no longer in italics

Figure 8: Summary of the "Welding" Text Analysis - Professionals

WELDING		
	ST	PTT
EXTRATEXTUAL FACTORS		
SENDER	sender: Ing. Svatopluk Černoch; text producer: Ing. Josef Jedlička (explicitly mentioned); monologue	missing academic title (Ing.)
INTENTION*	referential intention, neutral tone, text type conventions are not broken	more recurrences (repetition), some conventions are stronger but others are weaker
RECIPIENT	age: 20+; sex: both; education: university degree in technical area; geographic origin: Czech speaking people; social status: specialists, students (university)	no problems
MEDIUM	published writing, the book may also be used as a textbook for university students	slight change of layout (bold type, italics, and spaces between paragraphs), still acceptable
PLACE	Czech Republic, Prague; no regional dialects, standard neutral Czech	no problems
TIME	1977 (contemporary), published under the Communist regime – could have been censured	no problems
MOTIVE	to explain and to provide introduction to a chapter	no problems
TEXT FUNCTION	informative and educative (non-literary)	no problems
INTRATEXTUAL FACTORS		
SUBJECT MATTER	welded structures and components; thematically coherent; the subject matter is verbalised in the headline; not bound to cultural context	no problems
CONTENT*	factual internal situation; scientific prose style; formal register; slightly positive vocabulary; anaphoric references (2), substitution, paraphrase, recurrence; conjunctions: 16 coordinating (10 additive, 4 adversative, 2 gradation),	anaphoric references (3), slightly more recurrences; conjunctions: 16 coordinating (11 additive, 1 gradation, 4 adversative), 8 subordinating; verbs:

	7 subordinating; verbs: indicative mood prevails (1 conditional), majority in 3rd person singular/plural, majority active (15:6), all in present time	majority active (16:4), present tense only, mostly indicative mood (1 conditional)
PRESUPPOSITIONS*	elasticity modulus, spatial rigidity, bevels, fillet welds, one specification (*stykové, tupé, svary*)	no specification
TEXT COMPOSITION	part of a book (introduction); embedded references to other chapters of the book and a picture; headline; name of the author; two sub-headlines; divided into paragraphs	all paragraphs are now separated by a separate line
NON-VERBAL ELEMENTS	no specific non-verbal elements	no problems
LEXIS*	formal, no figurative speech; low degree of originality; clear author and his education; no addressing; objective; some positive vocabulary; references to previous chapters and pictures; no temporal references; not limited in space – few abbreviations; a lot of terminology	no problems
SENTENCE STRUCTURE*	sentences 12 (7 simple, 1 complex, 4 complex-compound) clauses 22 (13 independent, 9 dependent); average sentence length: 19,25	sentences 12 (7 simple, 1 complex, 4 complex-compound) clauses 20 (13 independent, 7 dependent); average sentence length: 19,67; fewer dependent clauses, some formulations are less condensed but others are condensed even more
SUPRASEGMENTAL FEATURES	bold headline; author's name, reference to a picture, and sub-headline in italics	one case of missed italics

5.2 External Factors

5.2.1 Intention

History TT

Concerning the students' final translation of the "History" text, the TT corresponds with the ST intention and most conventions of scientific prose style, described in Chapter 3.4, are even stronger: fewer instances of ellipsis (avoid ambiguity); more passive verb forms; both the ST and the TT contain a lot of recurrences (repetition of the same element or term to avoid ambiguity); more references (anaphora); more demonstratives (pronouns); bigger variety of connectors (namely additive conjunctions). For concrete examples see Chapter 5.3.1. On the other hand, some complex sentences were simplified in the TT and some are less condensed (see Ch. 5.3.4), the register is slightly less formal than the original one (see Ch. 5.3.3), and, sporadically, a verb phrase consisting of a verb and a noun was substituted by a verb (see Ch. 5.3.3).

Welding TTs

The students captured the style conventions quite well. Their TT, however, contains slightly more active verbs, one extra imperative which was not present in the original (see Ch. 5.3.1), and some of the formulations are less condensed (see Ch. 5.3.4). Likewise, the translation done by the professionals also presents slightly more active verb forms than the original, and, in addition, more recurrences (repetition to avoid ambiguity); see Chapter 5.3.1 for concrete examples. Finally, some ST formulations became less condensed while others are condensed even more (see Ch. 5.3.4).

5.2.2 Recipient

History TT

The only problem, with respect to the target recipient, is the title of the book mentioned in the text. Originally, the text referred to the Czech translation of the book, while the final TT refers to the German original. The ideal solution for a Czech reader would probably be the Czech translation (possibly with the German title in parentheses).

5.2.3 Conclusion on External Factors

From the analysis conducted so far, it arises that both the students and the professionals are fully aware of the external factors importance for translation. In addition, it ought to be said that the analysed texts were selected with respect to commercial practice, and they should therefore be representative ones (technical translation rather than literary

one). As a result, the number of translation problems arising from the external factors analysis is limited. However, neither of the translator groups did avoid making a mistake: the German title of a book instead of the Czech one and the omission of an academic title, for example.

5.3 Internal Factors

5.3.1 Content

History ST

The content of the "History" text can be paraphrased as the history of rolling-element bearings, their origin and development throughout history. The internal situation of the text is definitely factual; the author refers to the real world in which the communicative act takes place. The text was written in scientific prose style (as defined in Chapter 3.4) and the lexical items used match formal register (no colloquial words, no instances of social or regional dialect, etc.). All the aforementioned characteristics fit the presuppositions build up during the extratextual factors analysis (educated author, informative nature of the text, standard language elements and patterns). However, the text also contains some lexical elements with rather positive connotations: *výhody, pečlivě, zdokonalování, přesnost, vysoký stupeň* and so forth. Concerning cohesion, the text contains three examples of anaphoric reference:

- *Na rozdíl od válečkových ložisek nalézáme první kuličková ložiska teprve koncem 18. století. Je* ***to*** *zřejmě proto, že…*
- *V současné době dosáhla mezinárodní a národní normalizace valivých ložisek vysokého stupně nejen co se týče rozměrů, ale i přesnosti rozměrů a chodu běžných ložisek a ložisek s vysokou přesností, i některých vnitřních rozměrů.* ***Tento*** *vysoký stupeň normalizace umožňuje snadnou vyměnitelnost* ***této*** *nepostradatelné strojní součásti.*

It also presents a nice example of cataphoric reference:

- *První,* ***kdo*** *se vážně zabýval pokusy se třením a zkoumal valivé tření, byl Leonardo da Vinci.*

at least two examples of substitution:

- *stanovení rozměrů – normalizace*
- *ložiska – strojní součásti (substituted by a hypernym)*

an instance of paraphrase:

- *Na počátku doby bronzové,* ***tedy asi 1900 let před n.l.****, nacházíme kromě dřevěných kol též kola kovová.*

and many examples of recurrence (i.e. repetition of elements or patterns), which mostly concerns technical terms such as *tření, ložisko,* or *patent*. Concerning conjunctions, the "History" text contains 17 coordinating conjunctions – 14 additive (*a, jak, tak, nebo*) and three conjunctions expressing gradation (*nejen, ale i, i*); the number of subordinating conjunctions is five (*tedy, aby, kdo, proto že, než, nichž*).

Finally, the content analysis is concluded with a part focusing mainly on grammar. The overwhelming majority of grammatical features are completely in compliance with the text function and style. All the verbs are in indicative mood, the most common verb forms are the third person singular and plural (as in technical texts an author usually describes an object or an event and does not speak much about e.g. himself). Further, the author addresses the audience by means of verbs in first person plural (*nacházíme, nalézáme*). Concerning the voice of the verbs, the majority of them are active (15:9[5]). Finally, given the subject matter (history), it is not a startling discovery to conclude that the verbs in past tense prevail (14:10[6]).

History TT

Regarding the first part of the content analysis including mainly the style, register and internal situation of the text, the students do not seem to have any difficulty in translating the text and "adjusting" it to the original form. The target text also contains some examples of rather positive vocabulary: *výhody, důmyslný, vylepšení, vysoká míra, jednodušší*; however, not in the same quantity as the source text. Presumably, the students wanted to preserve the author's positive attitude to the subject matter but they also strived to meet the norms of an objective technical text.

There appear to be some changes to the text cohesion in the TT. The original cataphoric reference became a more standard anaphoric one:

- *Leonardo da Vinci byl první,* ***kdo*** *se odporem začal zabývat, a provedl první opravdové zkoušky tření.*

The target text also presents more examples of anaphoric references (3 instances in the ST vs. 6 instances in the TT). In an effort to avoid ambiguity, the students tried to establish more connections within the text.

[5] active:passive
[6] past:present

- *V nejjednodušších ložiscích byly pro přímočarý a rotační pohyb použity malé válečky.* ***Tyto*** *válečky byly odděleny jednoduchou klecí.*
- *Dalším typem je ložisko kuličkové.* ***Tento*** *typ se začal používat až na konci 18. století…*
- *Postupem času byly v mnoha zemích patentovány různé typy valivých ložisek [...]. Vývoj šel dál a nové patenty často vedly k vylepšování* ***daných*** *typů ložisek.*
- *Průměry lehkých, středních a těžkých sérií byly poprvé nastaveny v roce 1903, [...]. Později se hodnoty* ***těchto*** *specifikací (lehce upravené) staly…*
- *Dnešní mezinárodní a národní normy zabývající se valivými ložisky se liší v [...] a přesně vypracovaných ložisek. Vysoká míra standardizace tak umožňuje jednodušší výměnu* ***těchto*** *nezbytných komponentů.*

There are no shifts worth attention concerning the occurrence of substitution, paraphrase or recurrence. Regarding conjunctions, the target text contains 16 coordinating conjunctions – 14 additive (*a, či, nebo*) and no conjunctions expressing gradation. In comparison to the source text, the target text contains one adversative conjunction (*ale*), and one conjunction of reason (*tak*). The number of subordinating conjunctions is five (*tj., kdo, a to, proto že, než*). An overview of the conjunctions used both in the original and the final target text is displayed in the table (Figure 9) below.

Figure 9: Conjunctions in the "History" Text

Conjunctions	ST	TT
Total number of coordinating conjunctions	17	16
• Additive	14	14
• Gradation	3	0
• Adversative	0	1
• Reason	0	1
Total number of subordinating conjunctions	5	5

It arises from Figure 9 and the analysis that the mixture of different types of conjunctions is richer in the TT. However, after a closer look at the conjunctions themselves, the variety is definitely richer in the ST (as the TT often repeats the same conjunctions). Some of the original complex sentences are cut into simple ones (see Ch. 5.3.4) in the TT, and it contains more pronouns (and instances of anaphoric references) accordingly.

Finally, Figure 10 below provides a detailed summary of the grammatical part of the content analysis. It is clear from the table that the only significant change is the addressing which is not present in the TT. The slight shift in numbers of active/passive and past/present verb forms can be considered minor because the overall results of these parts of the analysis are still the same (i.e. the majority of the verbs are in past tense and active voice).

Figure 10: Verb Forms in the "History" Text

Verbs	ST	TT
Most common mood	indicative (only)	indicative (only)
Most common form	3rd person singular/plural	3rd person singular/plural
Most common voice	active (15:9)[7]	active (13:11)
Most common tense	past (14:10)[8]	past (19:5)
Addressing audience	1st person plural	no addressing

Welding ST

The other analysed text, "Welding", does not differ radically from the previous one: a factual text which corresponds with the real world, written in scientific prose style with formal register, etc. It also contains some examples of rather positive vocabulary: *podstatně tenčí, větší pevnost, dokonalá jakost, bohatý výběr*, etc. In this text, as well, there are some instances of anaphoric references:

- *Svařování umožňuje výrobu konstrukcí a součástí s podstatně tenčími stěnami, než jaké jsou obvyklé u litých konstrukcí. [...]* ***Tato*** *hospodářsky velmi významná výhoda svařovaných konstrukcí…*
- *Dokonalá jakost vyžaduje stykové (tupé) svary, pokud možno oboustranné, s dokonale provařeným kořenem;* ***ty*** *ovšem potřebují…*

at least three instances of substitution:

- *tlumící účinek – útlum kmitání*
- *vytvořit – navrhnout*
- *levná výroba – jen tak nákladné, jak je nezbytně nutné*

one example of paraphrase:

- *Dokonalá jakost vyžaduje stykové (****tupé****) svary, pokud možno oboustranné, s dokonale provařeným kořenem;*

[7] active:passive
[8] past:present

no examples of cataphoric reference or ellipsis, and, again, quite a lot of recurrences especially of technical terms, e.g. *lité konstrukce, svařované konstrukce, koutové svary, svarové spoje*, etc. Regarding the text cohesion, the number and kind of connectors should be mentioned. The text contains ten additive conjunctions (*a, jednak*), four adversative conjunctions (však, ovšem, zase, ale), and two conjunctions expression gradation (*i, a to i*) – as for the coordinating conjunctions. Further, the number of subordinating conjunctions is seven (*než, že, -li, pokud, které, jak*).

Concerning the text grammar, most of the verbs are in active voice (15:6) and in the third person singular or plural. All the verbs are in present tense. There is only one verb in the conditional mood (*dbá-li se*), the rest of them is then in indicative mood. The author does not address the audience in any way.

Welding TTs

The "Welding" text was translated by both the students and the professional translators. Much like the "History" text, the "Welding" text does not seem to be difficult or ambiguous concerning its style, register or internal situation for neither of the translator groups. The students again showed the tendency to moderate the author's positive attitude to the topic, presented by rather positive vocabulary. Nevertheless, the students' translation does contain some: *pevnější, vyšší koeficient, finanční výhody, předčí, vyšší tlumící účinek*. A sample of expressions with positive connotations used by the professionals: *podstatně tenčí, větší pevnost, dokonalá jakost, bohatý výběr*.

Concerning cohesion, the students' final target text includes more instances of anaphoric reference than the original text:

- *Finanční výhody svařovaných konstrukcí jsou ale vyváženy **jejich** špatnou rozměrovou stálostí a nízkým tlumicím účinkem.*
- *Zkušenost ale ukazuje, že pokud jsou během fáze návrhu dodrženy jisté konstrukční postupy, lze vytvořit konstrukce, **jež** svými vlastnostmi předčí **ty** lité…*
- *K dosažení dokonalé kvality je třeba použít oboustranný tupý spoj. **Ten** ale vyžaduje…*
- *Náklady lze snížit použitím rohového spoje, v **jehož** případě nejsou nutná…*

anaphoric references from the professional translation for comparison:

- *Svařování umožňuje vyrábět konstrukce a součásti se stěnami, které jsou značně tenčí, než je běžné u litých konstrukcí. V případě ocelových konstrukcí je **to***

zvýšenou pevností materiálů trubek a vyšším koeficientem pružnosti oceli v porovnání s šedou litinou. ***Tato*** *výhoda svařovaných konstrukcí…*

- *Vyšší kvalita vyžaduje tupé svary, nejlépe oboustranné s řádně provařeným kořenem; u* ***tohoto*** *druhu svarů jsou ovšem důležitá přesně připravená zkosení a dokonale lícující součásti.*

None of the final TTs contained a cataphoric reference. The professional translation presents more recurrences than the ST, and the students' translation repeats the expression "*tlumící účinek*" which is both in the ST and in the professional TT substituted rather than repeated. Further, the overview of the conjunctions used in the texts follows:

Figure 11: Conjunctions in the "Welding" Text

Conjunctions	ST	STT[9]	PTT[10]
Total number of coordinating conjunctions	16	17	16
• Additive	10	12	11
• Gradation	2	2	1
• Adversative	4	3	4
Total number of subordinating conjunctions	7	10	8

As can be seen from the above table, the professionals were better at preserving the exact mixture of different kinds of conjunctions. This, however, does not mean that their translation should be better than the students' one. It only proves that they were more loyal to the ST.

Finally, the grammatical features of the subject matter analysis are in question. Figure 12 below demonstrates that only two deviations can be found and both in the TT translated by the students. Their version of translation contains one extra imperative ("*viz*" is however not a typical imperative, but one used especially in technical texts for references), and also one extra verb in the future tense form (*bude muset odolávat*). Therefore, it appears that it was again the students who deviated more from the original. Yet still, these deviations do not appear to have any greater impact on the quality of the translated texts.

[9] Students' target text
[10] Professionals' target text

Figure 12: Verb Forms in the "Welding" Text

Verbs	ST	STT	PTT
Most common mood	indicative (1 conditional)	indicative (1 conditional, 1 imperative)	indicative (1 conditional)
Most common form	3rd person singular/plural	3rd person singular/plural	3rd person singular/plural
Most common voice	active (15:6)[11]	active (17:5)	active (16:4)
Most common tense	present (only)	present (1 future)	present (only)
Addressing audience	no addressing	no addressing	no addressing

5.3.2 Presuppositions

History

Given the fact that the "History" text is based on reality, it may contain some pieces of information about the source culture realia (culture-specific expressions or notions) or, in this case, some terminology. The author presupposes that the reader is aware of the following expressions, since he does not provide them with any explanation*: Leonardo da Vinci, Egypt a pyramida*. The text refers to the ISO standards for the field with which the reader should be familiar, as well as with the two books mentioned in the same text. Finally, the author considered it necessary to include one paraphrase or explicitation of the time period of the Bronze Age:

- *Na počátku doby bronzové,* ***tedy asi 1900 let před n.l.****, nacházíme…*

The translators left the aforementioned expressions without any explanation as they were in the original text, and they preserved the paraphrase, too. This, however, is the last thing that remained unchanged in the TT because the two references to books expressed by numbers in brackets disappeared, and the ISO norms are not even mentioned in the TT. Such failures seem quite significant for the target reader; especially in the case of experts fancying more information from other sources.

Welding

The "Welding" text is slightly more technical than the previous one since the terms presented without any additional information are primarily technical ones: *modul pružnosti, prostorová tuhost, úkosy, koutové svary*. The text also contains one short specification of the term *stykové svary*:

[11] active:pasive

- *Dokonalá jakost vyžaduje stykové (**tupé**) svary, pokud možno oboustranné…*

The exact form of the specification was not transferred into neither of the TTs – both groups of translators decided to omit "*stykové*" and preserved only the specification "*tupé*" together with the original noun "*svary*".

5.3.3 Lexis

History

The "History" text does not violate any conventions of the style of scientific prose concerning the lexis – it is formal, not rich in figurative speech and it was written with minimal degree of originality (e.g. no puns). It contains structures typical of scientific prose style, as described in Chapter 3.4, for instance "*zabývat se výrobou/pokusy*", and many nouns. From the text itself, it is not clear, who the author is, although he clearly and explicitly addresses the audience with verbs in the first person plural (*nacházíme, nalézáme*). The author is obviously aware of the text type conventions and, in compliance with his intention (to inform), he tries to be objective with the exception of some instance of rather positive vocabulary (mentioned in Chapter 5.3.1). This clearly marks his positive attitude to the subject matter. He also reinforces his view with the references to two other technical books, the work of well-known and distinguished Leonardo da Vinci, and with illustrative examples (*např. u náprav vozů a u jízdních kol*). The author made his text more reliable by mentioning international technical standards (ISO, ISA) and exact dates (years). At the very beginning of the article, the author presents a basic insight into the topic. The medium is not very limited in space (as opposed to e.g. newspaper advertisements) and allows the author to almost avoid abbreviations (there are just few: ISO, ISA, n.l., r., např.; and they improve text fluency). Further, the temporal references found in the text should not be actualised as they refer to unchanged "events". Finally, in order to reduce ambiguity to minimum, the article contains a lot of terminology.

Most of the lexical features remained unchanged. However, it is possible to spot some exceptions as e.g. the aforementioned (Ch. 5.3.1) missing addressing, less positive vocabulary, or the missing references to ISO and ISA norms. In some cases, the students inclined to slightly informal vocabulary: *vývoj šel dál* (ST: *vývoj pokračuje dál*), *první opravdové zkoušky tření* (ST: *vážně se zabýval pokusy se třením*), *již dávno* (ST: *v dávnověku*), etc. Finally, some of the verb phrases consisting of a verb and a

noun became verbs: *mnoho podniků vyrábělo* (ST: *mnoho podniků se zabývalo výrobou*).

Welding

Concerning the other text, "Welding", it is quite similar to the previous one. It differs only in several details: the author and his education are explicitly mentioned at the beginning of the text (*Ing. Josef Jedlička*); the author does not address the audience; he is objective and tries to illustrate both the upsides and drawbacks of welding (*Tato hospodářsky velmi významná výhoda svařovaných konstrukcí je oslabena nevýhodou...; je vždy kompromisem mezi jakostí na jedné straně a levnou výrobou na druhé straně...*); he reinforces his statements with references to previous chapters of the book and a picture. Despite his effort to be objective, the text does contain some rather positive vocabulary (*bohatý výběr, dokonale provařený kořen, dokonale vyhovující...*). It presents only one abbreviation (*obr*.) and it does not include any temporal references. In all the remaining aspects discussed in great detail with the previous text, the "Welding" text is similar to it.

There does not seem to be any dramatic changes concerning the lexis in neither the students' nor the professionals' TT.

5.3.4 Sentence Structure

The syntactic figures of speech have already been discussed together with the content (Ch. 5.3.1). Both texts contain structures typical of scientific prose style as described in Chapter 3.4 (e.g. semi-predicative constructions, complex sentences) and they are rather condensed:

- *Již v r. 1903 byly podniknuty první kroky ke stanovení rozměrů pro lehkou, střední a těžkou řadu, z nichž většina se pak stala základem rozměrového mezinárodního plánu ISA, později ISO.*
- *Zkušenosti však ukazují, že je možno vytvořit svařované konstrukce i lepších vlastností, než jaké mají lité konstrukce, a to i co do prostorové tuhosti a útlumu kmitání, dbá-li se při navrhování několika základních konstrukčních zásad.*
- *Úkolem konstruktéra je navrhnout vhodný tvar svařované součásti, dokonale vyhovující požadavkům daného případu a jen tak nákladné, jak je nezbytně nutné.*

Some of the ST formulations became less condensed in the "History" TT:

- ST: *V současné době dosáhla mezinárodní a národní* ***normalizace valivých ložisek*** *vysokého stupně...*
- TT: *Dnešní mezinárodní a národní* ***normy zabývající se valivými ložisky****...*

Several instances can also be found in the "Welding" TT translated by the students:

- ST: *Svařování umožňuje výrobu konstrukcí a součástí* ***s podstatně tenčími stěnami****...*
- TT: *Svařování je vhodné u dílů a konstrukcí,* ***jejichž stěny jsou mnohem tenčí*** *...*
- ST:*...je to dáno jednak větší pevností použitého válcového materiálu, jednak vyšším modelem pružnosti oceli proti šedé litině.*
- TT:*...proto, že válcovitý materiál používaný v ocelových svařovaných konstrukcích je ve srovnání s šedou litinou pevnější a poskytuje vyšší koeficient pružnosti.*
- ST: *Na konečné řešení má vliv nejen druh výrobku a jeho* ***namáhání****…*
- TT: *Výsledné řešení je ovlivněno i dalšími faktory: typem produktu a* ***tlakem, kterému bude muset odolávat****...*

There are also a few examples in the "Welding" PTT:

- ST: *Svařování umožňuje výrobu konstrukcí a součástí* ***s podstatně tenčími stěnami****...*
- TT: *Svařování umožňuje vyrábět konstrukce a součásti* ***se stěnami, které jsou značně tenčí...***
- ST: *...navrhnout vhodný tvar svařované součásti,* ***dokonale vyhovující*** *požadavkům daného případu...*
- TT: *...navrhnout vhodný tvar svařované součásti* ***tak, aby plně odpovídal*** *předpokládanému použití…*

These formulations are, however, compensated by condensation of other pieces of the "Welding" PTT:

- ST: *...dbá-li se při navrhování několika základních konstrukčních zásad...*
- TT: *...za předpokladu dodržení základních konstrukčních zásad...*
- ST: *...jen tak nákladné, jak je nezbytně nutné.*
- TT: *...při nejnižších možných nákladech.*

The total numbers of sentences in both the “History” and “Welding” text are put in contrast with their corresponding TTs in tables, Figure 13 and Figure 14, below:

Figure 13: Sentence Structure of the "History" Text

Sentence structure	ST	TT
Total number of sentences	18	19
• Simple	12	15
• Complex[12]	2	2
• Complex-compound[13]	4	2
Total number of clauses	25	26
• Independent	20	21
• Dependent	5	5
Average length of sentences[14]	17,06	15

Taking into consideration that the number of simple sentences, and the total number of all sentences as well, rose during translation, it seems that the students had split some originally complex-compound sentences into simple ones, or otherwise simplified the syntactic structures:

- ST: *Nejjednodušší bylo uložení pomocí válečků oddělených jednoduchou klecí, jak pro přímočarý, tak i pro rotační pohyb.*
- TT: *V nejjednodušších ložiscích byly pro přímočarý a rotační pohyb použity malé válečky. Tyto válečky byly odděleny jednoduchou klecí.*

Therefore, it is not a startling discovery to claim that the average length of sentences is also lower in the target text. However, the number of clauses and its subcategories did not change much.

[12] A complex sentence consists of at least one independent clause and one dependent clause.
[13] A complex-compound sentence consists of multiple independent clauses, at least one of which has at least one dependent clause.
[14] The number of words in all the sentences in the text without headlines, sub-headlines and numbers divided by the actual number of sentences.

Figure 14: Sentence Structure of the "Welding" Text

Sentence structure	ST	STT	PTT
Total number of sentences	12	12	12
• Simple	7	8	7
• Complex	1	1	1
• Complex-compound	4	3	4
Total number of clauses	22	22	20
• Independent	13	13	13
• Dependent	9	9	7
Average length of sentences	19,25	18	19,67

Here, again, the students were those who were inclined to making sentences simpler during translation. But the tendency was not as strong as with the previous text. The professional translators, on the other hand, managed to almost copy the sentence structure of the ST. Nevertheless, they did change the ration of independent and dependent clauses by avoiding some of the dependent clauses by other non-predicative constructions (e.g. verbal nouns instead of verbs) with the result of slightly more condensed text.

- ST: *dbá-li se při navrhování několika základních konstrukčních zásad*
- TT: *za předpokladu dodržení základních konstrukčních zásad*

5.3.5 Suprasegmental Features

The "History" text presents only one relevant suprasegmental feature mentioned by Nord (1991) – a cleft: "*První, kdo se vážně zabýval pokusy se třením a zkoumal valivé tření, byl Leonardo da Vinci*." Such cleft is quite rare in technical texts and it may be considered a slight deviation from the text type conventions (it produces ambiguity). The deviation is not reflected in the TT. The sentence was standardised (but with a punctuation mistake): "*Leonardo da Vinci byl první, kdo se odporem začal zabývat**,** a provedl první opravdové zkoušky tření.*"

5.3.6 Conclusion on Internal Factors

After a thorough analysis of the STs and their TTs, the existence of some differences, some of greater and some of lower importance, is obvious. For example, the changes in text composition and the lower number of suprasegmental features make it more difficult for the reader to orientate within the texts. None of the TTs was a perfect one

since absolute perfection is unreachable. Translator's unremitting endeavour to get as close to it as possible is, on the other hand, highly desirable. It arises from the internal factors analysis that the professional translators were more successful in translating a technical text, whereas the students sometimes missed smaller pieces of information. The professionals proved to be better at preserving the ST structure.

6 Error Analysis – Translation Units

This part of the thesis will mainly be devoted to the problem of errors in translation. The chapter will go even further in analysing the translated texts focusing primarily on the errors made by the translators. Therefore, it is necessary, firstly, to address the problem of what exactly can be considered an error in translation and, consequently, how to determine its relevance or impact on a target text. To define a mistake (disregarding language mistakes conforming to set and clear rules) is quite challenging, and different scholars would not agree on the definition. However, most of them would share the opinion that a microtextual analysis (e.g. in the form of the present error analysis) should form a part of translation quality assessment. For example, Malcolm Williams (2001) states that "microtextual analysis [...] provides error counts as a justification for a negative assessment," and adds that "it is felt that quantification lends objectivity to the assessment" (p. 328).

First, Nord's approach to the problem is explained followed by some views of other scholars, and the error analysis of the target texts. Second (Ch. 7), Pym's concept of natural vs. directional equivalents concludes the present error analysis.

6.1 Translation Error vs. Translation Problem

Christiane Nord distinguishes between translation problems and translation difficulties – two features closely connected with errors. To define the former one, a **translation problem** is "an objective problem which every translator has to solve during a particular translation task" (Nord, 1991, p. 151). This thus applies to every translator regardless of his level of competence and other factors influencing the process of translation (e.g. software or deadline). Such problems may arise from a specific source text (e.g. a pun), the nature of a translation task (pragmatic problems), the differences in a source language culture and a target language culture, and the structural differences between a source language and a target language (linguistic translation problems). **Translation difficulties**, on the other hand, are "translator specific". They are subjective and connected with translator competence and his specific working conditions. Translation problems are constant and they do not disappear with time as the translator masters his craft, contrary to translation difficulties.

Anthony Pym (2004) also mentions the term "translation problem" in his works where he defines it as follows: "A linguistic element becomes a translation problem

when the translator has to decide between more than one way of rendering it" (p. 3). In one of his former works, he also breaks such problems down into binary (there is only one right solution) and non-binary errors (Pym, 1992).

6.2 Error and Its Relevance

An error is usually defined as a deviation from a certain norm, convention, or a system of rules. However, Nord (1991) agrees with Kolde's more functionalist approach according to which "a particular expression or utterance does not in itself have the quality of being incorrect, but that it is assigned that quality by the recipient in the light of a particular norm or standard" (p. 169). The core of a translation error is thus the failure to take into account all of the translating instructions arising from the TT skopos.

Further, there is the problem of evaluating different errors in translation. Nord (1991) suggests that failure to solve a complicated problem is less serious than if the translator wrongly solves a simple problem. This bears some resemblance to Williams's (1989) concept of major and minor errors. Nord (1991) also prefers to count successful solutions rather than the wrong ones for its positive effect on a translator in training (p. 171). Nonetheless, the present analysis will comment on the incorrect solutions only (due to the limited space of the diploma thesis).

Finally, Nord (1991) presents a hierarchy of errors in which she considers the mistakes having some impact on the extratextual factors of primary importance because they guide recipient's expectations. According to her, pragmatic errors are more serious than linguistic ones. The importance of a particular external or internal factor depends on a concrete text. In other words, it is determined by the text skopos.

6.3 Major vs. Minor Error

Malcolm Williams who focuses on translation quality assessment in practice (i.e. in translation agencies) presents a slightly different approach to assessing errors. He divides errors into three groups: critical, major, and minor. His definition of each error is the following: "A critical defect is a defect that judgment and experience indicate is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon a product" (Williams, 1989, p. 23). A major error is then "likely to result in failure, or reduce materially the usability of the unit of product for its intended purpose" (Williams, 1989, p. 23), and a minor error is logically such an error that is not likely to cause any of the aforementioned but still an error. Such division must again

take into account the target text skopos since a minor error (e.g. wrong spelling in a footnote) can be major one in a different context (e.g. wrong spelling on a big sign or a billboard). According to Williams, the translator should never jeopardize the usability of a translation by allowing a critical defect, but a limited number of minor errors are acceptable.

His approach bears some resemblance to Pym's risk analysis (2004) since mistakes in high-risk elements will probably be the major or even critical ones. Williams (1989) also mentions the Translation Bureau (and its official TQA system – Sical III) which has combined a critical and a major error into one category, and added the categories of translation and language errors (p. 25). Consequently, there are four categories of errors according to the Translation Bureau: a major/minor language error and a major/minor translation error. The last step in translation evaluation is then to determine how many minor/major errors in a text (of a standard length) still allow for a translation to be acceptable.

6.4 Scales for Evaluating Translations

If the two approaches (Nord's and Williams's) should be compared, it seems that they can be combined. A reviewer can determine whether a mistake is critical, major or minor (or only major/minor), and then add to it one of the Nord's categories (pragmatic, cultural, linguistic, text-specific). Consequently, each type could be assigned an appropriate number of points to be deducted from translator's classification. A Spanish translation scholar, Hurtado Albir (1995), suggests something quite similar. She introduces three categories of errors (inappropriate renderings which affect the ST understanding, or expression in the TL, or the transmission of the ST function/s) which she divides into several subcategories. Further, she categorizes each error as a serious error (-2 points) or a minor error (-1 point). The main difference from the former combination of the two error analyses is that she also presents a scale for successful solutions of translation problems – a good solution (+1 point) and an exceptionally good solution (+2 points). However, she does not explain in great detail how to determine which error is serious and which one is minor.

Another theory concerning the nature of errors in translation has been developed by Christopher Waddington, who, as well as Nord, aims at students' translations in a university context. He determines the seriousness of a mistake by the fact how many other words in a text it influences. In author's own words, "[it] was designed to take

into account the negative effect of errors on the overall quality of the translation" (Waddington, 1999, Ch. 7). In his later work (Waddington, 2001), he describes a concrete scale for language and translation errors (p. 314). He proposes to deduct one point for every language error and two points for every translation error which negatively affects from one to five words. The bigger piece of the text the translation error affects, the more points should be deducted from the classification. Once again, Waddington's model of error analysis is congruent with Pym's risk analysis (2004) – failure to correctly render the meaning of a high risk translation unit will affect more words in the target text than if it was a low risk one.

6.5 Error Analysis

All the aforementioned models of error analysis tries to bring more objectivity into translation quality assessment since they present scales with points to be deducted or added to students'/professionals' classifications. However, they somehow overlook the text as a whole. Therefore, they should be used only as a supplement to a holistic method of translation evaluation. A text without any language mistakes and with only a few translation mistakes still does not have to be an acceptable translation.

Further, the analysed target texts will be presented. The following error analysis will be provided with tables consisting of a ST translation unit and a TT translation unit. Only those units where there were some translation or language errors will be mentioned (for the whole TTs divided into translation units and compared to the ST units see Appendices IV, V, VI). The language errors are marked with yellow colour, translation errors with light blue, and the major translation errors are in bold type.

6.5.1 History TT

The first analysed TT is the "History" text translated by the students:

2nd sentence of the "History" text	
ST	Výhody valivého tření byly známy již v dávnověku.
TT	Výhody valivého odporu jsou známy již dávno.

The phrase "valivé tření" changed to "valivý odpor", which is a slightly shift in the meaning. The shift is however compensated by the context of the phrase.

4th sentence of the "History" text	
ST	Na počátku doby bronzové, tedy asi 1900 let před n.l., nacházíme kromě dřevěných kol též kola kovová.
TT	V ranné době bronzové, tj. okolo roku 1900 př. n. l., se vedle dřevěných kol začala objevovat kola železná.

The adjective “kovová” changed to “železná”, which is more concrete than the original expression, and the translator cannot be sure of the exact kind of metal used. It also sounds strange in a sentence beginning with the time set of the Bronze Age.

5th sentence of the “History” text	
ST	Také válečná technika ve středověku používá pečlivě provedená uložení, aby se snížilo tření.
TT	Středověké válečné stroje využívaly ke snížení tření důmyslná ložiska.

The noun “uložení” was replaced by its hyponym “ložiska”, which is again more concrete than the original term. Moreover, experts from the field doubt that there were any bearings (in the modern sense of the word) in the Middle Ages.

6th sentence of the “History” text	
ST	První, kdo se vážně zabýval pokusy se třením a zkoumal valivé tření, byl Leonardo da Vinci.
TT	Leonardo da Vinci byl první, kdo se odporem začal zabývat, a provedl první opravdové zkoušky tření.

The phrase “valivé tření” changed to “valivý odpor”, which is exactly the same mistake as discussed with the second sentence. There is also a language mistake in punctuation since the two dependent clauses are additive and equal to each other – they should not be separated by a comma.

9th sentence of the “History” text	
ST	Je to zřejmě proto, že bylo snazší vyrobit válečky než kuličky.
TT	a to především proto, že výroba válečků byla v té době jednodušší než výroba kuliček.

The word “zřejmě” changed to “především”. This influences the degree of probability with which the event happened. “Zřejmě” just suggests the most probable possibility, contrary to “především” which is much stronger.

10th sentence of the “History” text	
ST	Teprve použití kuličkových ložisek ve větším rozsahu, např. u náprav vozů a u jízdních kol, dalo základ k hromadné výrobě kuliček a vývoji technologie výroby ložisek.
TT	K začátku masové výroby kuliček a vývoji výrobní technologie došlo společně s rozšířením používání kuličkových ložisek, například ve vlacích či jízdních kolech.

The phrase “náprav vozů” changed to the noun “vlacích”, which is just one example of a machine in which axle a ball bearing could be used.

11th sentence of the “History” text	
ST	Postupně bylo uděleno velké množství patentů v mnoha zemích na různá kuličková, válečková, kuželíková, soudečková a jehlová ložiska.
TT	Postupem času byly v mnoha zemích patentovány různé typy valivých ložisek: kuličková ložiska, válečková ložiska, kuželíková ložiska, kloubová ložiska či jehlová ložiska.

According to the experts on engineering with whom the author of the thesis could consult the matter, the expression “soudečková” refers to a different kind of bearing than the word “kloubová”, the translation is therefore misleading.

13th sentence of the “History” text	
ST	Závažným mezníkem ve vývoji valivých ložisek jsou klasické práce prof. Stribecka **[1]** zveřejněné v r. 1901, vycházející z teoretických prací H. Hertze „O styku pružných těles“ z r. 1895 **[2].**
TT	Velmi důležitá byla původní studie Prof. Stribecka z roku 1901, vytvořená na základě teoretické práce Heinricha Hertze z roku 1895 „**Über die Berührung Fester Elastischer Körper**”.

As it has already been discussed in the previous text analysis (Ch. 5.2.2), the Czech title of the book mentioned was replaced with a German one (in all probability the original one). In a technical text, where sources are of great importance, this seems to be a major translation mistake arising from insufficient research. A high-risk element was not devoted enough attention from the translators.

Another translation error are the missing references to two books from the field. Without them, the reader does not have the slightest idea that the books are referred to in the bibliography or footnote which may be translated by someone else (as quite often more translators work on the same paper or book at one time due to a tight deadline).

14th sentence of the “History” text	
ST	V době před r. 1900 se zabývala výrobou kuličkových nebo válečkových ložisek řada firem.
TT	V letech před rokem 1900 mnoho podniků vyrábělo pouze kuličková nebo válečková ložiska.

The adverb “pouze” changed the meaning of the sentence. The original says that many companies did manufacture ball or roller bearings, but they could have manufactured other things, too, whereas the TT suggests that those companies focused solely on the production of the mentioned bearings.

15th sentence of the “History” text	
ST	Již v r. 1903 byly podniknuty první kroky ke stanovení rozměrů pro lehkou, střední a těžkou řadu, **z nichž většina se pak stala základem rozměrového mezinárodního plánu ISA, později ISO.**
TT	Průměry lehkých, středních a těžkých sérií byly poprvé nastaveny v roce 1903**,**

The noun “rozměr” changed to “průměr”, which is a specific kind of dimension; more concrete than the original and thus misleading it this case. Further, there is a major translation error in the form of the omission of a part of the text containing references to the ISA and ISO norms which are well-known standards lending credibility to the text. Finally, the unit also contains a punctuation language error – the two independent clauses should not be separated by a comma in this particular sentence.

16th sentence of the "History" text	
ST	V roce 1915 byly stanoveny tolerance rozměrů děr a povrchů ložisek a později s malými změnami přijaty jako doporučení.
TT	a v roce 1915 byly zavedeny tolerance pro umístění ložiska a pro dotykovou plochu. Později se hodnoty těchto specifikací (lehce upravené) staly hodnotami doporučenými.

This is exactly the point where a reviewer has to take into account the motive of the text which is to give introductory information to the rest of the book. Therefore, the mistranslation, probably caused by translator's incorrect rendering of the expression, is not a major translation error in this context. However, if such mistake occurred later in the book, it would have more serious impact on the rest of the text and, chiefly, on reader's comprehension of the information contained.

17th sentence of the "History" text	
ST	V současné době dosáhla mezinárodní a národní normalizace valivých ložisek vysokého stupně nejen co se týče rozměrů, ale i přesnosti rozměrů a chodu běžných ložisek a ložisek s vysokou přesností, i některých vnitřních rozměrů.
TT	**Dnešní mezinárodní a národní normy zabývající se valivými ložisky se liší v detailech nejen vnějších a vnitřních rozměrů, ale také operační a rozměrové přesnosti standardů a přesně vypracovaných ložisek.**

In this case, on the other hand, not even the fact that the text is a "mere" introduction can justify such change of the meaning. The ST informs about the high standard of nation and international norms concerning different aspects of roller bearings, whereas the TT suggests that the norms are of low standard, and summarises in which aspects they still differ. Such mistranslation can be considered a major translation error in this context.

The total score of the "History" text is then two language errors, nine minor translation errors (one of which occurs twice – "valivý odpor"), and four major translation errors. Given the number of major errors together with the two language errors, the translation would be evaluated unacceptable as e.g. Sical III suggests that only a translation with fewer than 18 minor and maximum of one major error is acceptable.

6.5.2 Welding STT

The error analysis continues with the other text, "Welding", more precisely with the TT translated by the students:

1st sentence of the "Welding" text	
ST	Svařování umožňuje výrobu konstrukcí a součástí s podstatně tenčími stěnami, než jaké jsou obvyklé u litých konstrukcí.
STT	Svařování je vhodné u dílů a konstrukcí, jejichž stěny jsou mnohem tenčí než v případě jejich litých protějšků,

The verb "umožňuje" changed to "je vhodné", which is a slight shift in the meaning. In the ST, welding is an important action enabling the manufacturing of specific parts, meaning they cannot be made in any other way. However it arises from the TT that the welding is only one of many possibilities how to manufacture the parts (though the best one).

2nd sentence of the "Welding" text	
ST	U ocelových konstrukcí je to dáno jednak větší pevností použitého válcového materiálu, jednak vyšším modulem pružnosti oceli proti šedé litině.
STT	a to obzvláště proto, že válcovitý materiál používaný v ocelových svařovaných konstrukcích je ve srovnání s šedou litinou pevnější a poskytuje vyšší koeficient pružnosti.

The collocation "koeficient pružnosti" does not occur in engineering (used in mathematics), but a specialist would understand the intended meaning. There are several expressions equivalent to "modul pružnosti" in English one of which is the "coefficient of elasticity" – a so called false friend for Czech "koeficient" in this particular case.

3rd sentence of the "Welding" text	
ST	Tato hospodářsky velmi významná výhoda svařovaných konstrukcí je oslabena nevýhodou menší prostorové tuhosti tenkostěnných svařovaných konstrukcí a malým tlumícím účinkem.
STT	Finanční výhody svařovaných konstrukcí jsou ale vyváženy jejich špatnou rozměrovou stálostí a nízkým tlumicím účinkem.

The expression "vyváženy" is illogical in this sentence. It would work well with different word-order – if the down sides were mentioned first. Concerning the phrase "rozměrová stálost", it is not a precise translation of the original "prostorová tuhost".

4th sentence of the "Welding" text	
ST	Zkušenosti však ukazují, že je možno vytvořit svařované konstrukce i lepších vlastností, než jaké mají lité konstrukce, a to i co do prostorové tuhosti a útlumu kmitání, dbá-li se při navrhování několika základních konstrukčních zásad [26, 27, 82].
STT	Zkušenost ale ukazuje, že pokud jsou během fáze návrhu dodrženy jisté konstrukční postupy (viz 26, 27 a 28), lze vytvořit konstrukce, jež svými vlastnostmi předčí ty lité, či dokonce dosáhnout lepší rozměrové stálosti a vyššího tlumicího účinku.

"A to i" changed to "či dokonce" which definitely has a different meaning. The former one means "including" in the ST, and the latter one, from the TT, signifies

another level of the characteristic (as “even”). Again, the phrase “rozměrová stálost” is not a precise translation of the original as well as the other one, “tlumící účinek”.

6th sentence of the “Welding” text	
ST	Dokonalá jakost vyžaduje stykové (tupé) svary, pokud možno oboustranné, s dokonale provařeným kořenem; ty ovšem potřebují správně připravené úkosy a dokonale slícovaní součásti.
STT	K dosažení dokonalé kvality je třeba použít oboustranný tupý spoj. Ten ale vyžaduje správně připravená zkosení a přesné vyhlazení obou dílů.

The verbal noun “slícování” changed to “vyhlazení” which has a different meaning. However, the verb “vyhlazení” does not sound strange in the sentence, and it may also be true for many welded constructions.

7th sentence of the “Welding” text	
ST	Levná výroba zase vyžaduje koutové svary, které nemusí mít obrobené návarové plochy a nejsou náročné na lícování před svařením.
STT	Náklady lze snížit použitím rohového spoje, v jehož případě nejsou nutná ani předem připravená zkosení ani bezchybné vyhlazení.

The adjective “rohové” is a wrong translation. Moreover, there is no such collocation as “rohové spoje” in the context of welding. However, an expert from the filed would understand that the author means the corner joint. Further, the verbal noun “vyhlazení” presents exactly the same mistranslation as commented on in the sixth sentence.

9th sentence of the “Welding” text	
ST	Na konečné řešení má vliv nejen druh výrobku a jeho namáhání, ale také počet vyráběných kusů, skladový materiál, strojní zařízení závodu, dodací lhůty, zapracovanost svářečů.
STT	Výsledné řešení je ovlivněno i dalšími faktory: typem produktu a tlakem, kterému bude muset odolávat, požadovaným počtem kusů, dostupností materiálu a zpracovatelských strojů, datem dodání a úroveň zkušeností svářeče.

The case of the noun “úroveň” does not correspond with the verb “ovlivněno”, which requires instrumental case, and consequently with the rest of the sentence.

10th sentence of the “Welding” text	
ST	Tvary svarových spojů tvoří dvě základní skupiny: spoje s koutovými svary a spoje s tupými svary.
STT	Sváry se dělí na dva hlavní typy: ploché a koutové.

Firstly, there is a language error in the form of the word “sváry” (as fights) instead of “svary” in the above translation unit. This particular case was verified via the Internet Language Handbook (Internetová jazyková příručka) issued and run by the Institute of the Czech Language of the Academy of Sciences of the Czech Republic which explicitly emphasises the distinction between the two nouns.

Secondly, the adjective “tupé” became “ploché”, which cannot be considered a correct translation. Although there exists the expression “plochý svar” in welding, when

referring to the two main groups of welds, the translator should have used the precise term, “tupý svar”.

11th sentence of the “Welding” text	
ST	Bohatý výběr detailních tvarů je dán rozmanitostí úpravy návarových ploch.
STT	Obě skupiny obsahují řadu rozdílných tvarů s různými zkoseními.

The phrase “úprava návarových tvarů” changed to “tvary s různými zkoseními”. The original noun “úprava” may stand for chamfer[15] or roughness[16]. However, the target text expression suggests only the latter possibility, therefore, it is not precise.

12th sentence of the “Welding” text	
ST	Přehled základních tvarů svarových spojů je na *obr. 6.123*.
STT	Viz přehled typů svárů na obrázku 6.132.

The above translation unit contains exactly the same language error as the one discussed with the tenth sentence.

The overall score of the “Welding” text translated by the students is then: three language errors (one of which is repeated twice), ten minor translation errors (one of which occurs twice in the TT), and no major translation mistake. The fact that the translation does not contain any major translation error is highly positive. On the other hand, the number of language errors made by soon-to-be translators is quite high and cannot be justified by the repeated translation. Further, a translation containing ten minor translation errors is not an ideal one and probably would not be acceptable. However, concerning that it is a repeatedly translated text, ten is not such a great number.

6.5.3 Welding PTT

Finally, the analysis will proceed to the error analysis of the target text “Welding” translated by the professionals:

The author of the “Welding” text	
ST	*Ing. Josef Jedlička*
PTT	*Josef Jedlička*

In the course of translation, the author of the text lost the academic title (Ing.). Some people (authors) may feel offended by that, however, given the expertise with which the author describes technical details, the reader will probably come to the conclusion that he is an expert in the field with higher education.

[15] zkosení
[16] drsnost

2nd sentence of the "Welding" text	
ST	U ocelových konstrukcí je to dáno jednak větší pevností použitého válcového materiálu, jednak vyšším modulem pružnosti oceli proti šedé litině.
PTT	V případě ocelových konstrukcí je to zvýšenou pevností materiálů trubek a vyšším koeficientem pružnosti oceli v porovnání s šedou litinou.

The phrase "válcový materiál" changed to "materiál trubek", which does not exactly correspond with the original meaning. Also, the collocation "koeficient pružnosti" presents exactly the same mistake as commented on in the second sentence of the students' translation.

7th sentence of the "Welding" text	
ST	Levná výroba zase vyžaduje koutové svary, které nemusí mít obrobené návarové plochy a nejsou náročné na lícování před svařením.
PTT	Na druhé straně nízkonákladová výroba vyžaduje koutové svary, které nevyžadují obrobené svařované povrchy a slícování před svařováním není obtížné.

The inserted depended clause is separated by a comma only at its beginning. There is no comma right after it, which is a language error.

11th sentence of the "Welding" text	
ST	Bohatý výběr detailních tvarů je dán rozmanitostí úpravy návarových ploch.
PTT	Široký výběr specifických tvarů je důsledkem rozmanitosti obrábění svařovaných povrchů.

Last but not least, even a specialist in the field may get confused at this point because both the ST and the TT suggests something slightly different. "Úprava návarových ploch" stands for the processes done before the welding, whereas "obrábění svařovaných povrchů" represents the processes done after the welding.

The total score of the "Welding" target text translated by the professionals follows: one language error, four minor translation errors, and no major translation error. If there was no language error, the quality of the text would be surprisingly high, especially given the fact that the text was repeatedly translated. However, there is one language error despite the fact that the target texts translated by the professionals were, in all probability, proofread.

6.6 Conclusion on Error Analysis – Translation Units

The error analysis appears relevant for translation quality assessment. However, a mere analysis of translation and language errors is not sufficient, and probably not even possible to be conducted individually, since the seriousness of a mistake is usually determined by the context, text function, motive, etc. On the other hand, as a

complement to a holistic approach taking into consideration the aforementioned, it works perfectly well.

As it has already been mentioned before and in compliance with Nord's opinion, the text analysis presented in the thesis does not have to be performed in its entirety with every translation task. Once a translator or a reviewer has mastered the whole analysis and its application on various types of texts, he is able to determine which parts of the analysis may be relevant for a particular text, and which may be skipped (it saves time and makes the whole process more efficient). With such proficiency in the translation relevant text analysis, the error analysis represents the next level of evaluating translations from a more quantitative point of view.

Nord's division of various types of translation problems and difficulties is more relevant for students' training since it shows them the particular area they should work on (in case they constantly fail to solve a particular translation problem or have specific translation difficulty). Nonetheless, for the purposes of the present thesis, it is not necessary to consider such details. It seems that an error analysis revealing and commenting on language errors, and minor/major translation errors is wholly sufficient.

Concerning the error analysis of the three repeatedly translated texts, a reviewer could have expected that the results would be worse than with a text translated only once. However, the results, displayed in Figure 15, appear to be better than expected:

Figure 15: Error Analysis of the TTs

	History STT	Welding STT	Welding PTT
Language errors	2	3	1
Minor translation errors	9	10	4
Major translation errors	4	0	0
Total	15	13	5

The error analysis suggests that the texts did not change as dramatically as one may think. The text containing the highest number of errors of all kinds is the "History" text, although it contains less terminology and it is slightly more narrative than the other one. Four major translation errors together with two language errors signal poor quality of the translation. Contrary to the "Welding" text translated by the professional translators which is exactly on the opposite end of the scale with only four minor translation errors and a language error. However, the students were also more successful in translating the "Welding" text. According to the author's opinion, a TT (of a

repeatedly translated text) containing only minor translation errors (to some extent) can be considered a success.

To give a concrete example of evaluating a translation by means of error analysis, according to the aforementioned Sical III (Williams, 1989, pp. 25-27), there are three acceptable quality levels and one unacceptable. In short, among other criteria, a translation of superior quality (A rating) can contain maximum of six minor errors, a fully acceptable translation (B rating) may contain up to twelve minor translation or language errors (here the distinction of major/minor errors is applied on the language errors, too), a revisable translation (C rating) can even present one major translation error together with as many as 18 minor ones but no major language error, and, finally an unacceptable translation (D rating) contains too many errors to be effectively revised (meaning cost-effective revision). The scale is applicable on a standardised sample of a text with 400 words. Due to the length of the analysed texts ("History" text – 316 words, "Welding" text – 247 words) which are shorter than the standardised sample, the scale was adjusted accordingly:

Figure 16: Sical III Adjusted to the Analysed Texts

		A	B	C
History	Major	0	0	1
	Minor	5	9	14
Welding	Major	0	0	1
	Minor	4	7	11

According to Sical III (more precisely according to its simplified version taking into consideration only the error analysis which is, however, the core of it), only the "Welding" PTT is a fully acceptable translation (B) since there were only four minor translation errors and one minor language error. The same text translated by the students can be considered an unacceptable translation (D) with thirteen minor errors. The case of the "History" text with four major errors is clear – an unacceptable translation (D) according to Sical III.

7 Error Analysis – Errors

7.1 Natural vs. Directional Equivalence

With respect to the text type of the analyzed texts, it seems relevant to explore some of the translation errors from one last point of view. Technical texts are expected to flow with terminology and the analyzed texts are no exception to the rule. Accordingly, there is an important link between the text type and Anthony Pym's (2009) concept of natural and directional equivalence for he says about the former one: "They [the natural equivalents] are most frequently the stuff of terminology, or artificially standardised words that are *made* to correspond to each other exactly," and "[the specialized fields of knowledge] are unnaturally creating 'natural' equivalents all the time" (p. 90). Anthony Pym suggests the existence of a certain dichotomy in equivalence – he distinguishes between a natural and a directional equivalent. The definition of the former one will be presented first, since the connection with the analysed texts has just been shown.

To mark an equivalent as a natural one, it must not be affected by directionality (Pym, 2010, p. 7). In other words, an expression translated from a SL into a TL and again back-translated into the SL should stay the same – there does not exist any other appropriate equivalent to the notion neither in the SL nor in the TL but the one used. The directional equivalent, on the other hand, is an equivalent which is affected by the directionality and changes when being back-translated – there are more possible equivalents to an expression in at least one of the languages.

The analysis may show whether the translators had greater difficulty in translating natural or directional equivalents. It may seem that the first case is the easier way out, however, having to find one specific term in a TL may be more challenging than chose from a list of possible solutions. The analysis will address only the translation errors connected to equivalence (i.e. the cases of omission or addition will not be observed).

7.2 Directional Equivalents

A list of possible back-translations (with respect to the context) follows after each table.

5th sentence of the "History" text	
ST	Také válečná technika ve středověku používá pečlivě provedená uložení, aby se snížilo tření.
1TT	bearings
2TT	ložiska
3TT	bearings
4TT	ložiska

bearing = ložisko, uložení

9th sentence of the "History" text	
ST	Je to zřejmě proto, že bylo snazší vyrobit válečky než kuličky.
1TT	probably
2TT	nejspíš
3TT	probably
4TT	především

probably = pravděpodobně, zřejmě, nejspíš, asi, snad, etc.

10th sentence of the "History" text	
ST	Teprve použití kuličkových ložisek ve větším rozsahu, např. u náprav vozů a u jízdních kol, dalo základ k hromadné výrobě kuliček a vývoji technologie výroby ložisek.
1TT	wagon axles
2TT	nosných hřídelí vagonů
3TT	train car bearing shafts
4TT	vlacích

vůz = car, carriage, cart, wagon
wagon = vůz, vagon, dodávka
axle = osa, hřídel, náprava

15th sentence of the "History" text	
ST	Již v r. 1903 byly podniknuty první kroky ke stanovení rozměrů pro lehkou, střední a těžkou řadu, z nichž většina se pak stala základem rozměrového mezinárodního plánu ISA, později ISO.
1TT	dimensions
2TT	objem
3TT	diameters
4TT	průměry

dimension = dimenze, rozměr, míra, velikost

16th sentence of the “History” text	
ST	V roce 1915 byly stanoveny tolerance rozměrů děr a povrchů ložisek a později s malými změnami přijaty jako doporučení.
1TT	bearings’ hole and surface dimensions
2TT	uložení ložiska a rozměr styčného povrchu
3TT	bearing placement and for contact surface
3TT	umístění ložiska a pro dotykovou plochu

díra = hole, leak, gap, etc.
povrch = surface, face, circumference
hole = otvor, díra, mezera
surface = povrch, plocha

1st sentence of the “Welding” text			
ST	Svařování umožňuje výrobu konstrukcí a součástí s podstatně tenčími stěnami, než jaké jsou obvyklé u litých konstrukcí.		
1STT	allows	1PTT	enables
2STT	je vhodné	2PTT	umožňuje
3STT	appropriate	3PTT	enables
4STT	je vhodné	4PTT	umožňuje

umožnit = enable, make possible, provide for, allow, etc.
allow = dovolit, povolit, připustit, umožnit
enable = umožnit, dát možnost

2nd sentence of the “Welding” text			
ST	U ocelových konstrukcí je to dáno jednak větší pevností použitého válcového materiálu, jednak vyšším modulem pružnosti oceli proti šedé litině.		
1STT	coefficient of elasticity	1PTT	elasticity modulus
2STT	koeficient pružnosti	2PTT	modulu pružnosti
3STT	elasticity coefficient	3PTT	coefficient of elasticity
4STT	koeficient pružnosti	4PTT	koeficientem pružnosti

modul pružnosti = coefficient of elasticity, elastic (deformation) modulus, elongation modulus, modulus of elasticity

4th sentence of the “Welding” text			
ST	Zkušenosti však ukazují, že je možno vytvořit svařované konstrukce i lepších vlastností, než jaké mají lité konstrukce, a to i co do prostorové tuhosti a útlumu kmitání, dbá-li se při navrhování několika základních konstrukčních zásad [26, 27, 82].		
1STT	even with damping effect	1PTT	also with regard to oscillation damping
2STT	a dokonce tlumícího efektu.	2PTT	také vzhledem tlumení kmitání
3STT	even dumping effect	3PTT	also with respect to vibration damping
4STT	či dokonce tlumicího účinku	4PTT	a to i z hlediska tlumení chvění

even = dokonce, právě, zrovna, etc.
damping = útlum, tlumení, zeslabení
kmitání = oscillation, vibration, chattering
also = také, též, rovněž, etc.

6th sentence of the "Welding" text			
ST	Dokonalá jakost vyžaduje stykové (tupé) svary, pokud možno oboustranné, s dokonale provařeným kořenem; ty ovšem potřebují správně připravené úkosy a dokonale slícovaní součásti.		
1STT	aligned	1PTT	matched
2STT	zarovnané	2PTT	lícující
3STT	evening out	3PTT	fitting
4STT	vyhlazení	4PTT	lícující

slícování: fitment, fitting, mating

7th sentence of the "Welding" text			
ST	Levná výroba zase vyžaduje koutové svary, které nemusí mít obrobené návarové plochy a nejsou náročné na lícování před svařením.		
1STT	alignment	1PTT	matching
2STT	vyrovnání	2PTT	lícování
3STT	evening out	3PTT	fitting
4STT	vyhlazení	4PTT	slícování

lícování: adjusting fit, matching

11th sentence of the "Welding" text			
ST	Bohatý výběr detailních tvarů je dán rozmanitostí úpravy návarových ploch.		
1STT	ways of beveling	1PTT	finishes of welding surfaces
2STT	různých způsobů zkosení	2PTT	opracování návarových ploch
3STT	with different bevel	3PTT	welding surfaces machining
4STT	s různými zkoseními	4PTT	obrábění svařovaných povrchů

úprava = design, tailor, machining

7.3 Natural Equivalents

Each table is followed by a pair of natural equivalents.

2nd sentence of the "History" text	
ST	Výhody valivého tření byly známy již v dávnověku.
1TT	rolling friction
2TT	valivého odporu
3TT	rolling resistance
4TT	valivého odporu

valivé tření = rolling friction

4th sentence of the "History" text	
ST	Na počátku doby bronzové, tedy asi 1900 let před n.l., nacházíme kromě dřevěných kol též kola kovová.
1TT	iron
2TT	železná
3TT	iron
4TT	železná

kovový = metal (metalic)

6th sentence of the “History” text	
ST	První, kdo se vážně zabýval pokusy se třením a zkoumal valivé tření, byl Leonardo da Vinci.
1TT	friction
2TT	tření
3TT	resistance
4TT	odporem

tření = friction

11th sentence of the “History” text	
ST	Postupně bylo uděleno velké množství patentů v mnoha zemích na různá kuličková, válečková, kuželíková, soudečková a jehlová ložiska.
1TT	spherical roller
2TT	soudečková
3TT	spherical bearings
4TT	kloubová

soudečkové ložisko = spherical-roller bearing

13th sentence of the “History” text	
ST	Závažným mezníkem ve vývoji valivých ložisek jsou klasické práce prof. Stribecka [1] zveřejněné v r. 1901, vycházející z teoretických prací H. Hertze **„O styku pružných těles“** z r. 1895 [2].
1TT	**“On the Contact of Elastic Solids”**
2TT	**„O styku pružných těles“ (On the Contact of Elastic Solids)**
3TT	**“On the Contact of Elastic Solids”**
4TT	**„Über die Berührung Fester Elastischer Körper**”.

„O styku pružných těles“ = “On the Contact of Elastic Solids”

2nd sentence of the “Welding” text			
ST	U ocelových konstrukcí je to dáno jednak větší pevností použitého válcového materiálu, jednak vyšším modulem pružnosti oceli proti šedé litině.		
1STT	rolled material	1PTT	tubular material
2STT	válcovaný materiál	2PTT	trubkového materiálu
3STT	cylinder-shaped material	3PTT	pipe material
4STT	válcovitý materiál	4PTT	materiálů trubek

válcový materiál = cylindrical material

3rd sentence of the “Welding” text			
ST	Tato hospodářsky velmi významná výhoda svařovaných konstrukcí je oslabena nevýhodou menší prostorové tuhosti tenkostěnných svařovaných konstrukcí a malým tlumícím účinkem.		
1STT	spatial rigidity	1PTT	spatial rigidity
2STT	prostorovou pevnost	2PTT	prostorové tuhosti
3STT	dimensional solidity	3PTT	spatial rigidity
4STT	rozměrovou stálostí	4PTT	prostorové tuhosti

prostorová tuhost = spatial rigidity

7th sentence of the "Welding" text			
ST	Levná výroba zase vyžaduje koutové svary, které nemusí mít obrobené návarové plochy a nejsou náročné na lícování před svařením.		
1STT	corner joints	1PTT	fillet welds
2STT	spoje rohové	2PTT	svary koutové
3STT	corner joint	3PTT	fillet welds
4STT	rohového spoje	4PTT	koutové svary

koutový svar = fillet weld

10th sentence of the "Welding" text			
ST	Tvary svarových spojů tvoří dvě základní skupiny: spoje s koutovými svary a spoje s tupými svary.		
1STT	butt joints	1PTT	joints with butt welds
2STT	ploché spoje	2PTT	spoje s tupými svary
3STT	flat welds	3PTT	joints with butt welds
4STT	ploché svary	4PTT	spoje s tupými svary

spoje s tupými svary = joints with but welds

7.4 Conclusion on Error Analysis – Errors

The chapter is concluded with a table (Figure 17) summarising the numbers of directional and natural equivalents in the cases of translation errors.

Figure 17: Directional vs. Natural Equivalents

	History TT	Welding STT	Welding PTT	**Total**
Directional	5	7	2	**14**
Natural	5	3	1	**9**

It is clear from the above table that the number of mistakes made during the translation of directional equivalents is higher than the same number with natural ones. Such results may suggest that the repeated translation of directional equivalents bears a higher degree of risk and, also, that the risk is inversely proportional to the level of translator competence.

8 Conclusion

In conclusion, I would like to describe the significant changes which have emerged in the texts during the process of repeated translation. Given the limited number of materials used in the thesis, its results should serve only as guidance for further research – a pilot study.

The first thing to be considered is the most obvious change in the form of **errors**. All the target texts contain some language errors, mostly punctuation mistakes when a translator put a comma between two sentences where it is unnecessary, or vice versa. Apart from the punctuation mistakes, the texts contained one noun used in a wrong case (not in agreement with the preceding context), one illogical use of a positive expression in a negative context (*výhody jsou vyváženy nevýhodami*), and one word with an incorrect diacritical mark affecting its meaning (*sváry vs. svary*). I would not consider most of the aforementioned language errors major ones because they do not present an insurmountable obstacle to readers' comprehension of the texts. They may only divert readers' attention from the text itself. Nonetheless, I would not expect a professional (probably even proofread) or almost professional translation done into one's mother tongue to contain any language errors. Such failure cannot be justified by the fact that the texts were translated more than once.

Furthermore, the texts contained some translation errors as described in the two previous chapters (Chapter 6 and 7). The vast majority of them were minor errors, but a few of them were major ones. The error occurring with the highest frequency was the loss of a piece of information included in a ST but missing in a TT, or the inaccurate rendering of source text information resulting in mistranslation. The second part of the error analysis (Chapter 7) has proven that the translation of directional equivalents bears a higher degree of risk than the translation of natural ones, and, in addition, that the risk is inversely proportional to the level of translator competence.

Moving on to other changes in the texts, I have come to the conclusion that some of the translation units were **standardized**. To name just a few instances, a cleft sentence from a ST was not preserved in the TT (a cataphoric reference became an anaphoric one, see Ch. 5.3.1 and 5.3.5), the TTs contained less positive vocabulary (Ch. 5.3.1), and the addressing from a ST was missing in the TT (Ch. 5.3.1). Moreover, some of the style conventions were even stronger in the TTs – more passive verb forms, more

references (mostly in the form of demonstrative pronouns), fewer dependent clauses (substituted by e.g. a verbal noun), which made some of the texts more condensed (Ch. 5.2.1). On the other hand, the text type conventions were broken in some cases, e.g. the "Welding" STT is less condensed that the original (Ch. 5.3.4), and the "History" text contains several rather informal formulations (Ch. 5.3.3). The fact that some translation units or text features were standardized by the translators corresponds with one of the two laws proposed by Gideon Toury (1995). He argues that one of the laws which characterise the process of translation is the law of growing standardization, when ST textemes (units unique to a ST) are converted into TT repertoremes (units typical of a TL genre) (p. 267). Another concept dealing with the process of translation also bears resemblance to the findings. It is a translation universal – **normalization** – defined by Mona Baker (1996) as "the tendency to conform to patterns and practices, which are typical of the target language, even to the point of exaggerating them" (p. 176-177).

Concerning the translation universals (Baker & Saldanha, 1998, p. 306-310), there were also some instances of **explicitation** and **simplification** in the target texts. The explicitation is presented in the form of more instances of anaphoric reference (and demonstratives), bigger variety of conjunctions (explicitation of relations between clauses), and slightly more examples of recurrence (explicit repetition instead of implicit ellipsis), for examples see Chapter 5.3.1. The latter translation universal, simplification, is then represented by repetition rather than substitution (Ch. 5.3.1), shorter sentences or simplified syntactic structures (Ch. 5.3.4), and accordingly, a smaller number of subordinating conjunctions (Ch. 5.3.1) together with a lower average sentence length (Ch. 5.3.4). The last remark on the average sentence length is true with the exception of the TT translated by the professionals where it was slightly higher than in the original.

Last but not least, what has also changed during the process of repeated translation is the **layout** of the texts. However, the final target texts are still acceptable pieces of a technical text. Generally, the target texts contain fewer suprasegmental features (Ch. 5.3.5) than the corresponding originals, e.g. missing italics or bold type, missing offset at the beginning of every paragraph, or, on the contrary, an extra line after each paragraph.

From the above list of the changes which have occurred in the repeatedly translated texts, it seems that they do not differ radically from the processes taking place during usual translation from a SL into a TL. Any of the changes is directly connected

with chain or relay translation. Therefore, the quality of a chain of repeatedly translated texts can be enhanced by the perfection of its every single link. Nonetheless, the data collected in the present work may provide translators who are translating texts intended for relay translation with several pieces of advice on what to focus on during such specific translation:

- **Try to find high-risk elements with respect to the text function.**
- **Double-check that you have not omitted any of the high-risk elements or changed their meaning.**
- **When dealing with terminology, try to find a natural equivalent. If there is none, make sure you have chosen the right directional one.**
- **Double-check the text for language mistakes, especially in punctuation which may create ambiguity.**
- **Try to avoid simplification. Bear in mind that the following translator can opt for the same strategy and simplify the text even more.**
- **Do not change the layout of the text (if not demanded by the translation initiator or the TT skopos).**
- **Always bear in mind the target text skopos, the recipient and the fact that someone else is going to translate your target text into a third language.**

Concerning the two groups of translators possessing a different level of translator competence and engaged in the present experiment, it appears that the students tried to adhere to the text type conventions, sometimes at the expense of the author's style (e.g. less positive vocabulary, more references). The professionals, on the other hand, were more sensitive about the text itself (e.g. similar sentence structures, verb forms, mixture of conjunctions) and the author's style (e.g. preserved positive vocabulary).

It should also be pointed out that the thesis methodology may serve as a model for translation quality assessment (TQA) since it combines several existing models into a consistent whole. The method is both qualitative and quantitative. It strives to include all aspects relevant for TQA and explores the texts from surface (macrolevel) to core (microlevel). For translation reviewers, the thesis presents a brief overview of TQA models used in translation agencies or at universities around the globe.

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Summary

The aim of the thesis is to reveal the processes having a negative effect on the quality of repeatedly translated texts, if they prove to exist, and to provide translators participating in chain translation with advice. The awareness of such processes may help the translators being asked to translate an already translated text into a third language to devote more attention to the supposedly high-risk elements typical of repeated translation. Relay translation, for instance, is a kind of repeated translation used in the European Union with the aim to present all official documents in all EU official languages, including languages of limited diffusion.

The thesis explores different approaches to translation quality assessment which is fundamental for determining whether the processes taking place during the repeated translation have a negative effect on the target text quality or not. It arises from the research that the most appropriate approach to TQA, for the purposes of the thesis, is the one devised by Christiane Nord, and accompanied by some observations of Anthony Pym. Her model, which is mainly aimed at students' translations and training but still general enough to be applied to various text types, is a holistic one and, therefore, often overlaps with other TQA models. The analysis of both external (extratextual) and internal (intratextual) factors is accompanied by an error analysis and brief research into different approaches to error in translation.

Two technical texts from the field of engineering were selected for the analysis and translated by a group of students of English-language Translation and one of them also by a group of professional translators. In the conclusion, the results of the research are presented and put into the context of translation studies, in particular, the concepts dealing with the changes arising from the process of translation. Last but not least, the thesis offers advice to translators translating texts intended for relay translation, as well as a brief overview of TQA models used in translation agencies or at universities around the globe.

Resumé

Cílem práce je odhalit procesy, které mají negativní vliv na kvalitu opakovaně překládaných textů, pokud se projeví, a zformulovat rady pro překladatele, kteří se na opakovaném překladu podílí. Povědomí o těchto procesech může pomoci překladateli, který překládá již dříve přeložený text do dalšího cílového jazyka, zaměřit se na potenciálně riskantnější části překladu, typické pro opakovaně překládané texty. Obdobný opakovaný překlad (*relay* nebo *chain translation*) se běžně užívá v rámci Evropské unie. Jeho cílem je rozšířit oficiální dokumenty do všech oficiálních jazyků EU, včetně těch méně rozšířených (languages of limited diffusion).

Práce zkoumá různé přístupy k hodnocení kvality překladu, které je nezbytné proto, aby bylo možné určit, zda ten který proces probíhající při opakovaném překladu má negativní vliv na kvalitu cílového textu či nikoliv. Z výzkumu vyplývá, že pro účely této práce je nejvhodnějším postupem pro hodnocení kvality překladu postup navržený Christiane Nordovou doplněný o některé poznatky Anthony Pyma. Její model, který se zaměřuje především na překlady studentů a jejich přípravu, ale je stále dostatečně obecný, aby byl aplikovatelný na různé typy textů, je holistický, a proto ostatní modely zabývající se hodnocením překladu často přesahuje. Analýza extratextuálních a intratextuálních faktorů je pak doplněna o analýzu chyb a o stručný náhled do problematiky chyb v překladu a různých přístupů k nim.

Pro samotnou analýzu byly vybrány dva technické texty z oblasti strojírenství, které byly přeloženy skupinou studentů překladatelství anglického jazyka a jeden z nich také skupinou profesionálních překladatelů. V závěru práce jsou prezentovány výsledky výzkumu v kontextu celého oboru translatologie, a to především v kontextu konceptů zkoumajících změny textu při překladu. V neposlední řadě pak práce nabízí několik rad překladatelům, kteří překládají texty určené k opakovanému překladu, a stručný přehled modelů hodnocení kvality překladu užívaných v překladatelských agenturách či univerzitách po celém světě.

Appendices

Appendix I: History ST

Historie vzniku valivých ložisek je úzce spjata s historií vzniku strojů. Výhody valivého tření byly známy již v dávnověku. Ve starém Egyptě se používalo dřevěných válců při dopravě kamenných bloků pro stavbu pyramid. Na počátku doby bronzové, tedy asi 1900 let před n.l., nacházíme kromě dřevěných kol též kola kovová. Také válečná technika ve středověku používá pečlivě provedená uložení, aby se snížilo tření. První, kdo se vážně zabýval pokusy se třením a zkoumal valivé tření, byl Leonardo da Vinci.

Nejjednodušší bylo uložení pomocí válečků oddělených jednoduchou klecí, jak pro přímočarý, tak i pro rotační pohyb. Na rozdíl od válečkových ložisek nalézáme první kuličková ložiska teprve koncem 18. století. Je to zřejmě proto, že bylo snazší vyrobit válečky než kuličky. Teprve použití kuličkových ložisek ve větším rozsahu, např. u náprav vozů a u jízdních kol, dalo základ k hromadné výrobě kuliček a vývoji technologie výroby ložisek.

Postupně bylo uděleno velké množství patentů v mnoha zemích na různá kuličková, válečková, kuželíková, soudečková a jehlová ložiska. Vývoj pokračuje dále a objevující se nové patenty vedou spíše ke zdokonalování dosavadních konstrukcí ložisek.

Závažným mezníkem ve vývoji valivých ložisek jsou klasické práce prof. Stribecka [1] zveřejněné v r. 1901, vycházející z teoretických prací H. Hertze „O styku pružných těles“ z r. 1895 [2].

V době před r. 1900 se zabývala výrobou kuličkových nebo válečkových ložisek řada firem. Již v r. 1903 byly podniknuty první kroky ke stanovení rozměrů pro lehkou, střední a těžkou řadu, z nichž většina se pak stala základem rozměrového mezinárodního plánu ISA, později ISO. V roce 1915 byly stanoveny tolerance rozměrů děr a povrchů ložisek a později s malými změnami přijaty jako doporučení. V současné době dosáhla mezinárodní a národní normalizace valivých ložisek vysokého stupně nejen co se týče rozměrů, ale i přesnosti rozměrů a chodu běžných ložisek a ložisek s vysokou přesností, i některých vnitřních rozměrů. Tento vysoký stupeň normalizace umožňuje snadnou vyměnitelnost této nepostradatelné strojní součásti.

6.1.8. Svařované konstrukce a součásti

Ing. Josef Jedlička

Svařování umožňuje výrobu konstrukcí a součástí s podstatně tenčími stěnami, než jaké jsou obvyklé u litých konstrukcí. U ocelových konstrukcí je to dáno jednak větší pevností použitého válcového materiálu, jednak vyšším modulem pružnosti oceli proti šedé litině.

Tato hospodářsky velmi významná výhoda svařovaných konstrukcí je oslabena nevýhodou menší prostorové tuhosti tenkostěnných svařovaných konstrukcí a malým tlumícím účinkem.

Zkušenosti však ukazují, že je možno vytvořit svařované konstrukce i lepších vlastností, než jaké mají lité konstrukce, a to i co do prostorové tuhosti a útlumu kmitání, dbá-li se při navrhování několika základních konstrukčních zásad [26, 27, 82].

Základní tvary svarových spojů. Vyhovující svařovaná konstrukce je vždy kompromisem mezi jakostí na jedné straně a levnou výrobou na druhé straně.

Dokonalá jakost vyžaduje stykové (tupé) svary, pokud možno oboustranné, s dokonale provařeným kořenem; ty ovšem potřebují správně připravené úkosy a dokonale slícovaní součásti. Levná výroba zase vyžaduje koutové svary, které nemusí mít obrobené návarové plochy a nejsou náročné na lícování před svařením.

Úkolem konstruktéra je navrhnout vhodný tvar svařované součásti, dokonale vyhovující požadavkům daného případu a jen tak nákladné, jak je nezbytně nutné. Na konečné řešení má vliv nejen druh výrobku a jeho namáhání, ale také počet vyráběných kusů, skladový materiál, strojní zařízení závodu, dodací lhůty, zapracovanost svářečů.

Tvary svarových spojů tvoří dvě základní skupiny: spoje s koutovými svary a spoje s tupými svary. Bohatý výběr detailních tvarů je dán rozmanitostí úpravy návarových ploch. Přehled základních tvarů svarových spojů je na *obr. 6.123*.

Appendix III: Instructions

Instrukce k překladu textu

1. Text prosím přeložit do AJ/ČJ.
2. Text pochází z odborné publikace z oblasti strojírenství, která může sloužit také jako učebnice (Historie vzniku… – středoškolská; Svařované konstrukce… – vysokoškolská)
3. Text začínající „Historie vzniku valivých ložisek…“ vyšel v roce 1978 a text s nadpisem „Svařované konstrukce a součásti“ o rok dříve.
4. Oba texty jsou texty úvodní. „Historie vzniku…“ uvádí celou knihu a „Svařované konstrukce…“ pak kapitolu.
5. Cílový text je určen především odborníkům z oboru, druhotně pak také studentům.
6. Dále prosím identifikovat „high-risk elements“ podle Anthony Pyma[17]. Tedy takové části textu (slova, slovní spojení, čísla…), jejichž chybný překlad by byl pro
   funkci cílového textu zásadní. Pro lepší pochopení uvádí Pym příklad s překladem rodného listu. Pokud se špatně přeloží jméno narozeného nebo datum narození, je to zásadní problém. Pokud se špatně přeloží jméno porodní asistentky, funkci rodného listu v cílovém jazyce to příliš neovlivní.

Za překlad velmi děkuji.

[17] Pym, A. (2004). *Text and Risk in Translation*. Maria Sidiropoulou & Anastasia Papaconstantinou, eds Choice and Difference in Translation. The Specifics of Transfer. Athens: University of Athens. 27-42. Retrieved from http://usuaris.tinet.cat/apym/on-line/translation/risk_analysis.pdf

Appendix IV: Students' Translation of the "History" Text

1st sentence of the "History" text	
ST	Historie vzniku valivých ložisek je úzce spjata s historií vzniku strojů.
1TT	The history of the rolling-element bearing's origin is closely related to the history of the origins of machines.
2TT	Historie valivého ložiska je úzce spojena s historií strojů.
3TT	The history of roller bearing is closely bound up with the history of machines.
4TT	Historie valivého ložiska je úzce spjata s historií strojů.

2nd sentence of the "History" text	
ST	Výhody valivého tření byly známy již v dávnověku.
1TT	The advantages of rolling friction have been known since prehistory.
2TT	Výhody valivého odporu byly známy už v pravěku.
3TT	Advantages of the rolling resistance have been known since the primeval ages.
4TT	Výhody valivého odporu jsou známy již dávno.

3rd sentence of the "History" text	
ST	Ve starém Egyptě se používalo dřevěných válců při dopravě kamenných bloků pro stavbu pyramid.
1TT	Old Egyptians used wooden rollers when moving stone blocks for the purposes of pyramid building.
2TT	Staří Egypťané používali dřevěné válce k přemisťování kamenných bloků při stavbách pyramid.
3TT	The ancient Egyptians used wooden cylinders for moving stone blocks during construction of the pyramids.
4TT	Už staří Egypťané využívaly dřevěné válce pro přepravu kamenných bloků při stavbě pyramid.

4th sentence of the "History" text	
ST	Na počátku doby bronzové, tedy asi 1900 let před n.l., nacházíme kromě dřevěných kol též kola kovová.
1TT	At the beginning of the Bronze Age, in other words roughly in 1900 B.C., iron wheels started appearing beside wooden ones.
2TT	V rané době bronzové, tedy přibližně 1900 let př. n. l., se vedle dřevěných kol začala objevovat i kola železná.
3TT	In the early Bronze age, i.e. approximately 1900 B.C., iron wheels started to appear beside the wooden wheels.
4TT	V ranné době bronzové, tj. okolo roku 1900 př. n. l., se vedle dřevěných kol začala objevovat kola železná.

5th sentence of the "History" text	
ST	Také válečná technika ve středověku používá pečlivě provedená uložení, aby se snížilo tření.
1TT	War machines from the Middle Ages utilized carefully crafted bearings in order to decrease friction.
2TT	Středověké válečné stroje potom používaly důmyslně sestrojená ložiska, jejichž účelem bylo zmenšit tření.
3TT	Medieval war machines used sophisticated bearings that were to reduce friction.

4TT	Středověké válečné stroje využívaly ke snížení tření důmyslná ložiska.

6th sentence of the "History" text	
ST	První, kdo se vážně zabýval pokusy se třením a zkoumal valivé tření, byl Leonardo da Vinci.
1TT	The first person to study rolling friction and seriously pursue experimenting with friction was Leonardo da Vinci.
2TT	Jako první zkoumal odpor a prováděl seriózní pokusy v oblasti tření Leonardo da Vinci.
3TT	Leonardo da Vinci was the first one who began to explore resistance and began to conduct first serious friction experiments.
4TT	Leonardo da Vinci byl první, kdo se odporem začal zabývat, a provedl první opravdové zkoušky tření.

7th sentence of the "History" text	
ST	Nejjednodušší bylo uložení pomocí válečků oddělených jednoduchou klecí, jak pro přímočarý, tak i pro rotační pohyb.
1TT	The simplest bearings utilized small rollers separated by a simple cage for both rectilinear and rotational motion.
2TT	Nejjednodušší ložiska využívala k přímočarému i otáčivému pohybu malé válce, které jsou od sebe oddělené jednoduchou klecí.
3TT	The simplest bearings used small cylinders for straight and rotational motion. These cylinders were separated by simple cage.
4TT	V nejjednodušších ložiscích byly pro přímočarý a rotační pohyb použity malé válečky. Tyto válečky byly odděleny jednoduchou klecí.

8th sentence of the "History" text	
ST	Na rozdíl od válečkových ložisek nalézáme první kuličková ložiska teprve koncem 18. století.
1TT	As opposed to roller bearings, the first ball bearings did not appear until the end of 18th century.
2TT	Dalším typem jsou kuličková ložiska, která se začala používat až od konce 18. století,
3TT	Another type of bearing is the ball bearing. The usage of the ball bearing has started at the end of the 18th century,
4TT	Dalším typem je ložisko kuličkové. Tento typ se začal používat až na konci 18. století,

9th sentence of the "History" text	
ST	Je to zřejmě proto, že bylo snazší vyrobit válečky než kuličky.
1TT	This is probably because back then, rollers used to be easier to manufacture than balls.
2TT	nejspíš protože tehdy bylo snadnější vyrobit válečky než kuličky.
3TT	probably because of easier manufacture of cylinders than balls at that time.
4TT	a to především proto, že výroba válečků byla v té době jednodušší než výroba kuliček.

10th sentence of the "History" text	
ST	Teprve použití kuličkových ložisek ve větším rozsahu, např. u náprav vozů a u

	jízdních kol, dalo základ k hromadné výrobě kuliček a vývoji technologie výroby ložisek.
1TT	The basis for large-scale ball production and development of bearing production technology was not laid down until the beginning of a more widespread usage of ball bearings, e.g. in wagon axles or bicycles.
2TT	Základ velkovýroby kuliček a vývoje výrobní technologie ložisek byl položen, až když se používání kuličkových ložisek více rozšířilo, například u nosných hřídelí vagonů a jízdních kol.
3TT	The base of mass production of balls and manufacture technology development was set no earlier than the usage of ball bearings was widespread, used e.g. in train car bearing shafts and bicycles.
4TT	K začátku masové výroby kuliček a vývoji výrobní technologie došlo společně s rozšířením používání kuličkových ložisek, například ve vlacích či jízdních kolech.

11th sentence of the "History" text	
ST	Postupně bylo uděleno velké množství patentů v mnoha zemích na různá kuličková, válečková, kuželíková, soudečková a jehlová ložiska.
1TT	Gradually, a large amount of patents for different ball, cylindrical roller, tapered roller, spherical roller and needle bearings were granted in many countries.
2TT	Postupně byla v mnoha zemích uznána řada patentů na různá valivá ložiska: kuličková, válečková, kuželíková, soudečková a jehlová.
3TT	Gradually, in many countries there were acknowledged many patents on various roller bearings: ball bearings, cylinder bearings, conical bearings, spherical bearings and needle bearings.
4TT	Postupem času byly v mnoha zemích patentovány různé typy valivých ložisek: kuličková ložiska, válečková ložiska, kuželíková ložiska, kloubová ložiska či jehlová ložiska.

12th sentence of the "History" text	
ST	Vývoj pokračuje dále a objevující se nové patenty vedou spíše ke zdokonalování dosavadních konstrukcí ložisek.
1TT	The development continues further and new patents most often lead to improvements in existing bearing designs.
2TT	Jejich vývoj pokračoval a nové patenty často vedly k vylepšením stávajících typů ložisek.
3TT	Development of these bearings continued and new patents often led to improvements of the given bearing types.
4TT	Vývoj šel dál a nové patenty často vedly k vylepšování daných typů ložisek.

13th sentence of the "History" text	
ST	Závažným mezníkem ve vývoji valivých ložisek jsou klasické práce prof. Stribecka [1] zveřejněné v r. 1901, vycházející z teoretických prací H. Hertze „O styku pružných těles" z r. 1895 [2].
1TT	An important milestone in the development of rolling-element bearings is marked by the seminal works of prof. Stribeck [1] from 1901, which are based on H. Hertz's theoretical works "On the Contact of Elastic Solids" from 1895 [2].
2TT	Pro vývoj valivých ložisek byly velmi významné původní studie prof. Stribecka z roku 1901, které se opírají o teoretickou práci H. Hertze nazvanou „O styku

	pružných těles“ (On the Contact of Elastic Solids) z roku 1895.
3TT	Original studies of Prof. Stribeck from 1901 were of major significance. They are based upon theoretical work of H. Hertz named “On the Contact of Elastic Solids” from 1895.
4TT	Velmi důležitá byla původní studie Prof. Stribecka z roku 1901, vytvořená na základě teoretické práce Heinricha Hertze z roku 1895 „Über die Berührung Fester Elastischer Körper”.

14th sentence of the “History” text	
ST	V době před r. 1900 se zabývala výrobou kuličkových nebo válečkových ložisek řada firem.
1TT	In the period before the year 1900, many companies produced ball or roller bearings.
2TT	V období před rokem 1900 vyrábělo kuličková a válečková ložiska mnoho společností.
3TT	In the period before 1900, many companies manufactured ball and cylinder bearings.
4TT	V letech před rokem 1900 mnoho podniků vyrábělo pouze kuličková nebo válečková ložiska.

15th sentence of the “History” text	
ST	Již v r. 1903 byly podniknuty první kroky ke stanovení rozměrů pro lehkou, střední a těžkou řadu, z nichž většina se pak stala základem rozměrového mezinárodního plánu ISA, později ISO.
1TT	The first steps to set the dimensions of the light, medium and heavy series date back to 1903.
2TT	Objem lehkých, středních a těžkých sérií byl poprvé stanoven v roce 1903
3TT	Diameters for light, middle and heavy series were for the first time set in 1903,
4TT	Průměry lehkých, středních a těžkých sérií byly poprvé nastaveny v roce 1903,

16th sentence of the “History” text	
ST	V roce 1915 byly stanoveny tolerance rozměrů děr a povrchů ložisek a později s malými změnami přijaty jako doporučení.
1TT	The tolerances for the bearings’ hole and surface dimensions were set in 1915. Later, and with small changes, they were accepted as recommendations.
2TT	a roku 1915 byla definována tolerance pro uložení ložiska a rozměr styčného povrchu. Později se z těchto – lehce pozměněných - údajů stala doporučení.
3TT	and in 1915, the toleration for bearing placement and for contact surface were defined. Later on, these specifications - slightly modified - have become recommendations.
3TT	a v roce 1915 byly zavedeny tolerance pro umístění ložiska a pro dotykovou plochu. Později se hodnoty těchto specifikací (lehce upravené) staly hodnotami doporučenými.

17th sentence of the “History” text	
ST	V současné době dosáhla mezinárodní a národní normalizace valivých ložisek vysokého stupně nejen co se týče rozměrů, ale i přesnosti rozměrů a chodu běžných ložisek a ložisek s vysokou přesností, i některých vnitřních rozměrů.
1TT	Nowadays, the international and national standardization of rolling-element

	bearings reaches a high degree in respect to not only dimensions, but also dimensional and operational accuracy of standard and high-accuracy bearings, and some external dimensions.
3TT	Dnešní mezinárodní i národní normy týkající se valivých ložisek úzce specifikují nejen vnější a vnitřní rozměry, ale také provozní a rozměrovou přesnost standardních i velmi přesně konstruovaných ložisek.
3TT	Todays international and national norms regarding the roller bearings specify in detail not only outer and inner dimensions, but also the operational and dimensional accuracy of standard and precisely manufactured bearings.
4TT	Dnešní mezinárodní a národní normy zabývající se valivými ložisky se liší v detailech nejen vnějších a vnitřních rozměrů, ale také operační a rozměrové přesnosti standardů a přesně vypracovaných ložisek.

18^{th} sentence of the “History” text	
ST	Tento vysoký stupeň normalizace umožňuje snadnou vyměnitelnost této nepostradatelné strojní součásti.
1TT	The high level of standardization allows for easy replacements of this essential mechanical part.
2TT	Vysoká míra standardizace umožňuje snadnější náhradu těchto nepostradatelných součástek.
3TT	High standardization rate allows easier replacement of these essential components.
4TT	Vysoká míra standardizace tak umožňuje jednodušší výměnu těchto nezbytných komponentů.

Appendix V: Students' Translation of the "Welding" Text

The headline of the "Welding" text	
ST	**6.1.8. Svařované konstrukce a součásti**
1STT	***6.1.8.Welded constructions and part***
2STT	***6.1.8. Svařované konstrukce a díly***
3STT	**6.1.8 Welded parts and constructions**
4STT	6.1.8 Svařované díly a konstrukce

The author of the "Welding" text	
ST	*Ing. Josef Jedlička*
1STT	by Ing. Josef Jedlička
2STT	Ing. Josef Jedlička
3STT	Ing. Josef Jedlička
4STT	Ing. Josef Jedlička

1st sentence of the "Welding" text	
ST	Svařování umožňuje výrobu konstrukcí a součástí s podstatně tenčími stěnami, než jaké jsou obvyklé u litých konstrukcí.
1STT	Welding allows for constructions and parts with significantly thinner walls than those possible in cast constructions.
2STT	Sváření je vhodné pro konstrukce a díly se stěnami výrazně slabšími, než kterých by bylo možné dosáhnout u litých konstrukcích.
3STT	Welding is appropriate in parts and constructions with walls much thinner than those attainable in cast constructions.
4STT	Svařování je vhodné u dílů a konstrukcí, jejichž stěny jsou mnohem tenčí než v případě jejich litých protějšků,

2nd sentence of the "Welding" text	
ST	U ocelových konstrukcí je to dáno jednak větší pevností použitého válcového materiálu, jednak vyšším modulem pružnosti oceli proti šedé litině.
1STT	This thanks to the fact that steel welded constructions use rolled material which is both stronger, and has a higher coefficient of elasticity than gray iron.
2STT	A to především proto, že válcovaný materiál používaný pro ocelové svařované konstrukce je pevnější a má vyšší koeficient pružnosti než šedá litina.
3STT	This is mainly because, in comparison to grey cast iron, cylinder-shaped material used in steel weld constructions is more solid and proves a higher elasticity coefficient.
4STT	a to obzvláště proto, že válcovitý materiál používaný v ocelových svařovaných konstrukcích je ve srovnání s šedou litinou pevnější a poskytuje vyšší koeficient pružnosti.

3rd sentence of the "Welding" text	
ST	Tato hospodářsky velmi významná výhoda svařovaných konstrukcí je oslabena nevýhodou menší prostorové tuhosti tenkostěnných svařovaných konstrukcí a malým tlumícím účinkem.
1STT	This economical advantages of welded constructions are offset by the fact that thin-walled welded constructions have low spatial rigidity and a weak damping effect.

2STT	Ekonomické výhody svařovaných konstrukcí jsou ovšem vyváženy faktem, že slabostěnné svařované konstrukce mají malou prostorovou pevnost a slabý tlumící efekt.
3STT	The economic advantages of welded constructions are, however, counterbalanced by welded thin-wall constructions proving low dimensional solidity and low dumping effect.
4STT	Finanční výhody svařovaných konstrukcí jsou ale vyváženy jejich špatnou rozměrovou stálostí a nízkým tlumicím účinkem.

4th sentence of the "Welding" text	
ST	Zkušenosti však ukazují, že je možno vytvořit svařované konstrukce i lepších vlastností, než jaké mají lité konstrukce, a to i co do prostorové tuhosti a útlumu kmitání, dbá-li se při navrhování několika základních konstrukčních zásad [26, 27, 82].
1STT	Practice has shown, however, that it is possible to create welded constructions with better characteristics than in cast constructions, even with higher spatial rigidity and a larger damping effect, if several constructional guidelines are observed during the designing phase [26, 27, 82].
2STT	Praxe však ukázala, že při dodržování určitých konstrukčních postupů při navrhování (26, 27, 28), je možné vyrobit svařované konstrukce s lepšími vlastnostmi než mají lité konstrukce a dokonce docílit větší prostorové pevnosti a silnějšího tlumícího efektu.
3STT	Yet experience showed that if observing certain constructional procedures during the phase of designing (see 26, 27, and 28), it is possible to produce constructions with better qualities than those of cast constructions or even achieve higher dimensional solidity and dumping effect
4STT	Zkušenost ale ukazuje, že pokud jsou během fáze návrhu dodrženy jisté konstrukční postupy (viz 26, 27 a 28), lze vytvořit konstrukce, jež svými vlastnostmi předčí ty lité, či dokonce dosáhnout lepší rozměrové stálosti a vyššího tlumicího účinku.

The subheadline of the "Welding" text	
ST	*Základní tvary svarových spojů.*
1STT	*Basic shapes of welded joints.*
2STT	*Základní typy svarů.*
3STT	*Basic division of welds*
4STT	*Základní dělení svárů*

5th sentence of the "Welding" text	
ST	Vyhovující svařovaná konstrukce je vždy kompromisem mezi jakostí na jedné straně a levnou výrobou na druhé straně.
1STT	Each acceptable welded construction is a result of a compromise between quality on one hand, and inexpensiveness on the other.
2STT	Každá přijatelná svařovaná konstrukce je výsledkem kompromisu mezi kvalitou na jedné straně a cenou na straně druhé.
3STT	Every fair welded construction constitutes a compromise between quality on one side and price on the other.
4STT	Každá dobře svařená konstrukce je kompromisem mezi kvalitou na jedné straně a cenou na straně druhé.

6th sentence of the "Welding" text	
ST	Dokonalá jakost vyžaduje stykové (tupé) svary, pokud možno oboustranné, s dokonale provařeným kořenem; ty ovšem potřebují správně připravené úkosy a dokonale slícovaní součásti.
1STT	The perfect quality requires the use of butt joints, preferably double-welded, with the material welded completely through. These however require properly prepared bevels and need the parts to be aligned perfectly.
2STT	Pro dosažení bezvadné kvality je nutno použít tupé, ideálně dvakrát svařované, spoje, kdy je materiál provařený skrz. Tyto spoje však vyžadují správně připravené úkosy a bezchybně zarovnané díly.
3STT	In order to achieve perfect quality, it is necessary to use a butt joint and double welding technique if possible, in which the material is welded through. These joints require properly prepared bevels and precise evening out of the parts.
4STT	K dosažení dokonalé kvality je třeba použít oboustranný tupý spoj. Ten ale vyžaduje správně připravená zkosení a přesné vyhlazení obou dílů.

7th sentence of the "Welding" text	
ST	Levná výroba zase vyžaduje koutové svary, které nemusí mít obrobené návarové plochy a nejsou náročné na lícování před svařením.
1STT	In contrast, an inexpensive production calls for corner joints, which neither require the welding surface to be beveled beforehand nor demand a perfect alignment.
2STT	Na rozdíl od toho lze pro cenově výhodnější výrobu použít spoje rohové, které nevyžadují zkosení svařovaného povrchu předem ani perfektní vyrovnání.
3STT	Alternatively, to reduce the costs, a corner joint can be used which doesn't require pre-bevelling of the welded surface, nor perfect evening out.
4STT	Náklady lze snížit použitím rohového spoje, v jehož případě nejsou nutná ani předem připravená zkosení ani bezchybné vyhlazení.

8th sentence of the "Welding" text	
ST	Úkolem konstruktéra je navrhnout vhodný tvar svařované součásti, dokonale vyhovující požadavkům daného případu a jen tak nákladné, jak je nezbytně nutné.
1STT	It is a responsibility of the designer to come up with a suitable shape for the welded part, perfectly appropriate for the given requirements and only as expensive as necessary.
2STT	Je na konstruktérovi, aby navrhl pro svařované díly vhodný typ spoje, vyhovující daným požadavkům a za cenu nezbytně nutnou.
3STT	It is up to the constructor to design the right type of joint for the parts to be welded which meets the respective technical and financial requirements.
4STT	Správný typ spoje, který splňuje dané technické a finanční nároky, musí pro svařované díly vybrat konstruktér.

9th sentence of the "Welding" text	
ST	Na konečné řešení má vliv nejen druh výrobku a jeho namáhání, ale také počet vyráběných kusů, skladový materiál, strojní zařízení závodu, dodací lhůty, zapracovanost svářečů.
1STT	The final solution depends not only on the type of the product and the stress is

	needs to withstand, but also on how many parts are to be produced, on the available stock, machinery, delivery date and the experience of the welders.
2STT	Konečné řešení závisí jak na typu výrobku a tlaku, kterému tento výrobek musí odolat, ale také na tom, kolik dílů by se mělo vyrobit, na dostupných zásobách, strojním zařízení, termínu dodání a zkušenostech svářečů.
3STT	The final solution is influenced by additional factors: the type of product and the pressure it has to resist, the number of the pieces which should be produced, availability of material and processing machines, the delivery date, and the level of experience of the welder.
4STT	Výsledné řešení je ovlivněno i dalšími faktory: typem produktu a tlakem, kterému bude muset odolávat, požadovaným počtem kusů, dostupností materiálu a zpracovatelských strojů, datem dodání a úroveň zkušeností svářeče.

10th sentence of the "Welding" text	
ST	Tvary svarových spojů tvoří dvě základní skupiny: spoje s koutovými svary a spoje s tupými svary.
1STT	The types of joints can be divided into two main groups: butt joints, and corner joints.
2STT	Typy svarů lze rozdělit do dvou hlavních skupin: ploché spoje a rohové spoje.
3STT	The two main types of welds are flat and fillet welds.
4STT	Sváry se dělí na dva hlavní typy: ploché a koutové.

11th sentence of the "Welding" text	
ST	Bohatý výběr detailních tvarů je dán rozmanitostí úpravy návarových ploch.
1STT	Each has a wide variety of specific shapes which arise from various ways of beveling.
2STT	Každá skupina obsahuje mnoho rozdílných specifických tvarů, které se liší dle různých způsobů zkosení.
3STT	Each group includes a number of distinct specific shapes with different bevel.
4STT	Obě skupiny obsahují řadu rozdílných tvarů s různými zkoseními.

12th sentence of the "Welding" text	
ST	Přehled základních tvarů svarových spojů je na *obr. 6.123*.
1STT	For an overview of basic joint types, see fig. 6.132.
2STT	Přehled základních typů svarů je uveden na obr. 6.132.
3STT	See the overview of the types of welds in picture 6.132.
4STT	Viz přehled typů svárů na obrázku 6.132.

Appendix VI: Professionals' Translation of the "Welding" Text

The headline of the "Welding" text	
ST	**6.1.8. Svařované konstrukce a součásti**
1PTT	**6.1.8. Welded structures and components**
2PTT	**6.1.8. Svařované struktury a komponenty**
3PTT	**6.1.8 Welded Structures and Components**
4PTT	**6.1.8 Svařované konstrukce a součásti**

The author of the "Welding" text	
ST	*Ing. Josef Jedlička*
1PTT	*Ing. Josef Jedlička*
2PTT	*Ing. Josef Jedlička*
3PTT	*Josef Jedlička*
4PTT	*Josef Jedlička*

1st sentence of the "Welding" text	
ST	Svařování umožňuje výrobu konstrukcí a součástí s podstatně tenčími stěnami, než jaké jsou obvyklé u litých konstrukcí.
1PTT	Welding enables the production of structures and components with substantially thinner walls than it is usual in cast structures.
2PTT	Svařování umožňuje vyrábět struktury a komponenty s podstatně tenčími stěnami, než je běžné u litých struktur.
3PTT	Welding enables to manufacture structures and components with walls that are substantially thinner than it is common in cast structures.
4PTT	Svařování umožňuje vyrábět konstrukce a součásti se stěnami, které jsou značně tenčí, než je běžné u litých konstrukcí.

2nd sentence of the "Welding" text	
ST	U ocelových konstrukcí je to dáno jednak větší pevností použitého válcového materiálu, jednak vyšším modulem pružnosti oceli proti šedé litině.
1PTT	In case of steel structures this is due to both greater strength of the tubular material and higher elasticity modulus of steel in comparison to gray iron.
2PTT	V případě ocelových struktur je to díky větší pevnosti trubkového materiálu a vyššímu modulu pružnosti oceli ve srovnání s šedou litinou.
3PTT	In the case of steel structures this is due to the increased strength of the pipe material and a higher coefficient of elasticity of steel, compared with gray cast iron.
4PTT	V případě ocelových konstrukcí je to zvýšenou pevností materiálů trubek a vyšším koeficientem pružnosti oceli v porovnání s šedou litinou.

3rd sentence of the "Welding" text	
ST	Tato hospodářsky velmi významná výhoda svařovaných konstrukcí je oslabena nevýhodou menší prostorové tuhosti tenkostěnných svařovaných konstrukcí a malým tlumícím účinkem.
1PTT	This economically very significant advantage of welded structures is diminished by the disadvantage of lower spatial rigidity of welded thin-walled structures and a small damping effect.

2PTT	Tato ekonomicky velmi významná přednost svařovaných struktur je oslabována nevýhodou nižší prostorové tuhosti svařovaných struktur s tenkými stěnami a malého tlumicího efektu.
3PTT	This advantage of welded structures, economically very important, is reduced by the disadvantage of lower spatial rigidity of welded structures with thin walls, and a lower damping effect.
4PTT	Tato výhoda svařovaných konstrukcí, ekonomicky velmi významná, je snížena nevýhodou nižší prostorové tuhosti svařovaných konstrukcí s tenkými stěnami a nižším tlumicím účinkem.

4th sentence of the "Welding" text	
ST	Zkušenosti však ukazují, že je možno vytvořit svařované konstrukce i lepších vlastností, než jaké mají lité konstrukce, a to i co do prostorové tuhosti a útlumu kmitání, dbá-li se při navrhování několika základních konstrukčních zásad [26, 27, 82].
1PTT	However, experience shows that it is possible to design welded structures with better properties than cast structures also with regard to spatial rigidity and oscillation damping when basic construction principles are followed during the design [26, 27, 82].
2PTT	Nicméně zkušenosti ukazují, že lze navrhnout svařované struktury s lepšími vlastnostmi, než mají struktury lité, také vzhledem k prostorové tuhosti a tlumení kmitání, pokud jsou během návrhu dodrženy základní konstrukční zásady [26, 27, 82].
3PTT	Nevertheless, experience shows that it is possible to design welded structures with better properties than cast structures, also with respect to the spatial rigidity and vibration damping, provided the basic design principles are observed. [26, 27, 82].
4PTT	Zkušenosti nicméně ukazují, že za předpokladu dodržení základních konstrukčních zásad [26, 27, 82] je možné navrhovat svařované konstrukce s lepšími vlastnostmi, než mají lité konstrukce, a to i z hlediska prostorové tuhosti a tlumení chvění.

The subheadline of the "Welding" text	
ST	*Základní tvary svarových spojů.*
1PTT	*Basic welding joint types.*
2PTT	*Základní typy svarových spojů*.
3PTT	*Basic types of welded joints.*
4PTT	*Základní druhy svařovaných spojů.*

5th sentence of the "Welding" text	
ST	Vyhovující svařovaná konstrukce je vždy kompromisem mezi jakostí na jedné straně a levnou výrobou na druhé straně.
1PTT	Appropriate welded structure is a compromise between the quality on one hand and the cheap production on the other.
2PTT	Vhodná svařovaná struktura je kompromisem mezi kvalitou na straně jedné a levnou výrobou na straně druhé.
3PTT	A suitable welded structure is a compromise between the quality on the one hand, and the cheap production on the other hand.
4PTT	Vhodná svařovaná konstrukce je kompromisem mezi kvalitou na jedné straně a

	levnou výrobou na straně druhé.

6th sentence of the “Welding” text	
ST	Dokonalá jakost vyžaduje stykové (tupé) svary, pokud možno oboustranné, s dokonale provařeným kořenem; ty ovšem potřebují správně připravené úkosy a dokonale slícovaní součásti.
1PTT	Superior quality requires butt welds, preferably double-sided with a thoroughly welded root; for this type of welds, however precisely prepared bevels and perfectly matched components are essential.
2PTT	Vyšší kvalita vyžaduje tupé svary, pokud možno dvojstranné a s důkladně svařeným kořenem; pro tento typ svarů jsou však nezbytně nutná přesně připravená zkosení a bezchybně lícující komponenty.
3PTT	Higher quality requires butt welds, preferably double-sided with a thoroughly welded root; for this type of welds, however, accurately prepared bevels and perfectly fitting components are essential.
4PTT	Vyšší kvalita vyžaduje tupé svary, nejlépe oboustranné s řádně provařeným kořenem; u tohoto druhu svarů jsou ovšem důležitá přesně připravená zkosení a dokonale lícující součásti.

7th sentence of the “Welding” text	
ST	Levná výroba zase vyžaduje koutové svary, které nemusí mít obrobené návarové plochy a nejsou náročné na lícování před svařením.
1PTT	Cheap production, in contrast, requires fillet welds for which machined welding surfaces are not necessary and matching before welding is not demanding.
2PTT	Oproti tomu levná výroba vyžaduje svary koutové, u kterých nejsou nutné obrobené návarové plochy a lícování před svářením není náročné.
3PTT	On the other hand, low-cost production requires fillet welds that do not require machined welding surfaces and fitting before welding is not difficult.
4PTT	Na druhé straně nízkonákladová výroba vyžaduje koutové svary, které nevyžadují obrobené svařované povrchy a slícování před svařováním není obtížné.

8th sentence of the “Welding” text	
ST	Úkolem konstruktéra je navrhnout vhodný tvar svařované součásti, dokonale vyhovující požadavkům daného případu a jen tak nákladné, jak je nezbytně nutné.
1PTT	Designer engineer's task is to design a suitable form of welded component fully satisfying the case requirements and only as expensive as it is absolutely necessary.
2PTT	Konstruktér má za úkol navrhnout vhodnou podobu svařovaného komponentu, která by plně vyhovovala zadání při co možná nejnižších nákladech.
3PTT	The designer's task is to propose a suitable form of a welded component, in full compliance with the assignment, at the lowest possible cost.
4PTT	Úkolem konstruktéra je navrhnout vhodný tvar svařované součásti tak, aby plně odpovídal předpokládanému použití při nejnižších možných nákladech.

9th sentence of the “Welding” text	
ST	Na konečné řešení má vliv nejen druh výrobku a jeho namáhání, ale také počet vyráběných kusů, skladový materiál, strojní zařízení závodu, dodací lhůty,

	zapracovanost svářečů.
1PTT	The final solution is based not only on the product type and its load but also on the number of produced items, stock material, plant machinery, delivery time and experience of welders.
2PTT	Finální řešení tedy nevychází pouze z typu produktu a jeho zatížení, ale také z počtu vyráběných jednotek, materiálu, který je k dispozici na skladě, ze strojového vybavení závodu, termínu dodání a ze zkušeností svářečů.
3PTT	The final solution is therefore based not only on the product type and its load, but also on the number of units produced, material available on the stock, machinery equipment, delivery date, and the experience of welders.
4PTT	Konečné řešení není proto založeno pouze na druhu výrobku a jeho namáhání, ale i na počtu vyráběných jednotek, materiálu dostupném ve skladu, strojním zařízení, termínu dodání a zkušenostech svářečů.

10th sentence of the "Welding" text	
ST	Tvary svarových spojů tvoří dvě základní skupiny: spoje s koutovými svary a spoje s tupými svary.
1PTT	There are two basic groups of welded joint types: joints with fillet welds and joints with butt welds.
2PTT	Existují dvě základní skupiny typů svarových spojů: spoje s koutovými svary a spoje s tupými svary.
3PTT	There are two basic groups of welded joints: joints with fillet welds, and joints with butt welds.
4PTT	Existují dvě základní skupiny svařovaných spojů: spoje s koutovými svary a spoje s tupými svary.

11th sentence of the "Welding" text	
ST	Bohatý výběr detailních tvarů je dán rozmanitostí úpravy návarových ploch.
1PTT	An ample selection of detailed shapes is due to the diversity of finishes of welding surfaces.
2PTT	Bohatý výběr konkrétních tvarů je důsledkem rozmanitosti opracování návarových ploch.
3PTT	A broad selection of specific shapes is the result of diversity of welding surfaces machining.
4PTT	Široký výběr specifických tvarů je důsledkem rozmanitosti obrábění svařovaných povrchů.

12th sentence of the "Welding" text	
ST	Přehled základních tvarů svarových spojů je na *obr. 6.123*.
1PTT	See picture *6.123*. for the overview of basic types of welding joints.
2PTT	Přehled základních typů svarových spojů ukazuje obrázek *6.123*.
3PTT	An overview of basic types of welded joints is shown in Figure *6.123*.
4PTT	Přehled základních druhů svařovaných spojů je zobrazen na obrázku *6.123*.