

<sup>1</sup>G.D. Aitzhanova , <sup>2</sup>R.A. Turekhanova ,

<sup>1</sup>Candidate of Philological science, A/Professor of Al-Farabi Kazakh National University,  
<sup>2</sup>Candidate of Pedagogical science, A/Professor of Satpayev Kazakh National Technical University,  
Kazakhstan, Almaty, e-mail: a.gulnara70@mail.ru, assi\_t@list.ru

## ANALYSIS OF LEXICAL ANTONYMS IN THE GERMAN RAILWAY LANGUAGE AND THEIR CLASSIFICATION

**Abstract.** The article discusses about the technical terminologies in modern language science and its effectiveness. The subject of the study of the given work is German and Russian railway terminology; antonyms included its lexis encoding concepts. Special attention is given to the antonym classifications. The object of the study is railway lexis encoding concepts of objects by term units antonymous by meaning. Furthermore, body of terms with opposite meaning in its verbal representation in the German and Russian languages and their classification in the indicated terminological systems. The relevance of the work is defined by the absence of a comprehensive study of the German and Russian railway antonymy in their comparative-typological perspective. Research language material shows that term entering into antonymous relations according to an essential differential feature.

In the course of study it was revealed that one and the same essence (meaning) includes terms for the opposite spatial localization of the same object or spatial localization of an action described. Also explores the cognitive mechanisms of lexical and grammatical features of antonyms in the term formation on the material of the railway terminology in the English and Russian languages.

**Key words:** semantic relationship, space localization of objects, location of objects, contradictory antonyms, contrary antonyms

<sup>1</sup>Г.Д. Айтжанова, <sup>2</sup>Р.А. Тореханова,  
әл-Фараби атындағы Қазақ ұлттық университетінің <sup>1</sup>доценті, ф. ғ. к.,  
Сәтбаев атындағы Қазақ ұлттық техникалық университетінің доценті <sup>2</sup>, п. ғ. к.,  
Қазақстан, Алматы қ., e-mail: a.gulnara70@mail.ru, assi\_t@list.ru

### Неміс теміржол тілінің лексикалық антонимдерін талдау мен оларды саралау

**Аңдатпа.** Техникалық терминология қазіргі тіл ғылымында анағұрлым қарқынды зерттелген. Берілген жұмыстың зерттеу нысаны – неміс және орыс теміржол терминологиясы, дәлірек айтсақ, лексикасы ең аз зерттелген антонимия. Ерекше көңіл антонимдік классификацияға бөлінген. Зерттеу объектісі – темір жол лексикасы мәтіннің антонимдік терминдік бірліктер арқылы объектілердің бірнеше санын кодтау. Зерттеудің субъективті бөлімі – бұл терминдік жүйелердегі германиялықтар мен орыс тілдеріндегі және олардың классификациясындағы вербальды ретресиямен оррозиттік мағыналы терминдердің жиынтығын қарастырады. Жұмыстың өзектілігі олардың неміс пен орыс тілінде кездесетін темір жол антонимасын жан-жақты зерттеудің болмауымен анықтады. Бұрын зерттеу нысанына айналмаған категорияларының ғалымдар назарын аудара отырып, осы сала зерттейтін мәселелер аясын кеңейткенін көрсетеді. Сонымен қатар, зерттеу материалы зерттеген терминдер бір маңызды ерекшелігіне сәйкес терминдердің антонимді қатынастарға енетіндігін көрсетеді. Зерттеу материалы дифференциалды бір сипаттамаға сәйкес антонимдік қатынастарға түсетін терминдерді көрсетеді. Зерттеу барысында ол ашылды және сол бір эссенция (түсіну) лазерлизациялау терминдерін немесе антеннаның құрылған локализациясын анықтайды. Сонымен қатар, ол ағылшын және орыс тілдеріндегі темір жол терминологиясының материалы бойынша терминдегі лексика және грамматикалық антонимдердің когнитивті мезанизмдерін зерттейді. Сонымен, мақаланың нысаны болып теміржол аксиологиялық семантиканы көрсететін әртүрлі тілдік деңгейдің тілдік құралдары болып табылады. Осы мақаланың зерттеу пәні болып аксиологиялық семантиканы және олардың негізінде жататын когнитивтік құрылымдардың репрезенттерін табу болып табылады.

**Түйін сөздер:** семантикалық байланыс, объектілердің кеңістікті локализациясы, құрылым, қарама-қайшы антонимдер, қарама-қарсы антонимдер.

<sup>1</sup>Г.Д. Айтжанова, <sup>2</sup>Р.А. Тореханова,

<sup>1</sup>к. ф. н. доцент Казахского национального университета им. аль-Фараби,

<sup>2</sup>к. п. н., доцент Казахского национального технического университета им. К. И. Сатпаева,  
Казахстан, г. Алматы, e-mail: a.gulnara70@mail.ru, assi\_t@list.ru

### **Анализ лексических антонимов в немецком железнодорожном языке и их классификация**

**Аннотация.** Техническая терминология наиболее интенсивно изучается в современной языковой науке. Предметом исследования данной работы является немецкая и российская железнодорожная терминология, а именно антонимия, наименее изученная ее лексика. Особое внимание уделяется классификации антонимов. Целью исследования является лексика, кодирующая понятия объектов по терминологическим единицам, анонимным по смыслу. Предметом исследования является совокупность терминов с противоположным значением в его словесном представлении в немецком и русском языках и их пояснении в указанных терминологических системах. Актуальность работы определяется отсутствием всестороннего изучения германской и русской железной дороги в их сравнительно-терминологическом аспекте. В ходе исследования выяснилось, что один и тот же смысл (в том числе) включает в себя термины для противоположной общей локализации одного и того же объекта или определенной локализации описания.

Кроме того, изученные исследования показывают, что термины вступают в анонимные отношения в соответствии с одной существенной отличительной чертой. В ходе исследования выяснилось, что одна и та же сущность (смысл) включает в себя термины для противоположной общей локализации одного и того же объекта или стратегической локализации описанного понятия. Кроме того, он также исследует когнитивные механизмы лексических и гигантских особенностей антонимов в терминах формирования на материале терминологии железных дорог в английском и русском языках.

**Ключевые слова:** семантические связи, пространственная локализация объектов, качественный контраст, противоположное расположение объектов, номинативная конструкция, противоречивые антонимы, противоположные антонимы.

## **Introduction**

The object of the study is railway lexis encoding concepts of objects by term units antonymous by meaning. The subject of the study is the body of terms with opposite meaning in its verbal representation in the German and Russian languages and their classification in the indicated terminological systems.

The relevance of the work is defined by the absence of a comprehensive study of the German and Russian railway antonymy in their comparative-typological perspective. The monograph by Chernyshova L.A. "Industry terminology in the light of anthropocentric paradigm" (Chernyshova, 2010:206) has direct connection with the topic of our research. However, it explores the cognitive mechanisms of lexical and grammatical features of antonyms in the term formation on the material of the railway terminology in the English and Russian languages.

However, before proceeding to the direct analysis of antonyms in the railway language, it is important to focus on the characteristic of the term concept in general. The science about terms (study of terms) is

considered to be a relatively young and at the same time, according to some linguists, rather well studied scientific area. Thus, for example, if in the 70s of the last century it was believed that "the science about language has no ...quite reasonable consistent theory of terms and term systems and therefore it cannot suggest developed, strict technique of lexicographic and other descriptions of terms for needs of practice" [Golovin, 1970: 17-26], then in the 80s it was possible to come across statements that "current complaints about a suspense of many general theoretic problems are already untenable" (Averbukh, 1985: 1-8).

## **Materials and methods**

At the end of the 20th century the situation began changing due to the advent of cognitive approach to the analysis of terminological units. In the world linguistics "terminological explosion" is observed, i.e. mass emergence of "new terms, terminological fields and the whole terminological systems, and it makes significant changes to existing terminological systems" (Azimov, 1976: 3-11). Researchers state that "every science, every rather

developed branch of knowledge possesses its own developed language” but the languages “are so little studied” (Gerd, 2005: 15). At closer examination of various terminological systems it is revealed the necessity to revise a number of differential signs of the term which was considered to be stable, firm and beyond any doubt. In the traditional study of terms the lexis of the specialized language has a number of distinctive features, such as: accuracy, a single meaning, brevity, needs no context, stylistic neutrality, lack of synonymy. If a unit of specialized lexis does not correspond to the features listed above, it cannot be attributed to the category of terms.

A similar understanding of the term existed in the German linguistic space too. A representative of the Munich applied linguistics W. Wills, for example, analyzing the language of science and technology, writes that the professional language “is approaching the status of an ideal language which makes it possible to secure reliable understanding of scientific relations” (Wills, 1979: 5-6).

The statement has repeatedly been criticized. B.N. Golovin calls in question the legitimacy of requirements imposed to the term in a number of works. According to him “some of these requirements are not complied with in the life of science, while others are meaningless” and “nevertheless, a significant portion of really functioning terminology... continues to serve the relevant branches of knowledge” (Golovin, 1972: 16; Golovin, 1981: 8). In A.I. Moiseyev’s opinion, “signs commonly attributed to the terms and terminology in general: accuracy of the meaning, unambiguity, etc. – no more than their tendency or their desirable qualities, or, at last, requirements to well- and rationally-structured terminology” (Moiseyev, 1990: 89-96).

Our research also shows that not all the terms of the “railroad” sublanguage meet traditional demands imposed to it by the study of terms, therefore it is necessary to specify some disputable, from our point of view, statements concerning essential features of the linguistic phenomenon under consideration.

Accuracy is composed of two principles – unambiguity and single-form formulation, that is every term has to express only one concept not allowing possibilities of various interpretations. Accuracy also means the lack of not only absolute doublets, but also partial synonyms. The studied language material at the paradigmatic level allows to claim that an array of specialized lexis belonging to the “railroad” sublanguage, along with the wide layer of monocematic terms, includes also polysemantic lexis, homonyms, synonyms, antonyms characterized by blurred boundaries

and, hence, requires a context, and characteristics attributed to them are rather desirable qualities since their realization in the functioning term systems is impossible.

The property of the human mind to think in contrasts, that is divide objects and phenomena of the surrounding reality into halves and create opposites from them, is reflected by the presence of antonymous terms in the technical sublanguage. (Antonymy originates from Greek “against” and “name, designation,” semantic opposition).

In linguistics it is believed that the problem of antonymy in the system of terminology does not cause heated debates, as this “lexical-semantic process (in contrast to the terminological polysemy and terminological synonymy) occurs similar to analogous common language process” (Odinokova, 2006: 23-25).

In the common language antonyms are words opposite in meaning and this relationship is not nominative but the result of splitting the neutral meaning into two opposites. In nouns with the direct meaning, antonymy is seen less often; it occurs, first of all, in nouns correlated with antonymous adjectives: light – darkness, heat – cold, good – evil, poverty – wealth, width – narrowness. The same is true with the verbs: to become poorer – to become rich, to love – to hate, to start – to stop, etc.

The analyzed language material shows that this type of semantic relations in the studies of scientific and technical terminology is not a subject to debate, so we cannot determine what place it occupies among other terminological systems. The “railroad” sublanguage reveals the presence of a significant body of terminological units, manifesting opposite meanings, interconnected among themselves with various relations. This may be classic antonyms (free runner (wagon), good runner (wagon) – bad runner (wagon), slow-running wagon = Gutläufer – Schlechtläufer; a powerful locomotive – a low-power locomotive = Großlokomotive – Kleinlokomotive, etc.), but more often the relationship among technical terms cannot be brought under the strict concept of ‘opposition’, that is lexical antonymy. Terms-antonyms, contrasting pairs of units, mutually assume each other since antonyms they designate characterize one and the same denotation from different points of view, thereby forming a single object and a single concept (Franziskus, 1998:283).

Antonymous pairs include two or three words in contrast to the structure of synonymous series which is normally open and has a large number of words. In the Russian language antonyms are the terms

– word-combinations, in the German language antonyms are mainly compound words.

### Result and discussion

Research of the language material shows that terms are entering into antonymous relations according to one essential differential feature. In the course of study it was revealed that one and the same essence (meaning) includes terms for the opposite spatial localization of the same object or spatial localization of an action. In the nominative constructions of the given category, lexical material verbalizes also temporal characteristics of some reality fragments. Four types of opposites, singled out by us, reflect:

1) opposite location of objects in the railway space (front – back, top – bottom, inside – outside, straight – curve, initial – terminal) – departure track (initial) – arrival track (terminal) = Ausfahrgleis – Einfahrgleis; holding track – open track = Wartegleis – Fahrgleis; departure platform – arrival platform = Abfahrtsbahnsteig – Ankunftsbahnsteig; make-up yard – splitting-up yard = Zugbildungsstation – Auflösungsbahnhof; junction station – non-junction station = Knotenbahnhof – Nichtknotenbahnhof; head junction station – dead-end junction station = Anfangsknotenbahnhof – Endknotenbahnhof; curved track – straight track = Bogengleis – Geleise in der Geraden; frontal tipper – a wagon with overturning back body = Vorderkipper – Hinterkipper; substructure way – superstructure way (permanent way) = Unterbau – Oberbau; outer stretch of rails – inside stretch of rails = äußerer Schienenstrang – innerer Schienenstrang, etc.

2) Opposite direction of an action name (back – front, left – right, oppositely directed) – left-hand movement – right-hand movement = Linksbetrieb – Rechtsverkehr; reverse running – forward running = Rückgang – Vorwärtsgang; return of goods to consignor – acceptance of goods = Zurücknahme – Aufnahme; departure (train) – backing movement (shunting) = Abfertigung – Zurücksetzung; making-up of trains, forming of trains – splitting up of trains = Zugbildung – Zugauflösung, etc.

3) temporal features of a certain fragment of reality – slow, minimum – maximum, increase – decrease: slow-acting braking – quick-acting braking = Langsambremse – Schnellbremse; decrease of speed – increase of speed = Geschwindigkeitsabnahme – Geschwindigkeitserhöhung; minimum speed – movement at a medium speed – maximum speed = Kleinstgeschwindigkeit – Mittelschnellfahrt – Höchstgeschwindigkeit.

4) qualitative contrast of different parts of railway reality – power, size, and shape (large – small, running – holding): minimum slope (railway bed) – maximum slope = Mindestgefälle – Maximalgefälle; bad runner – good runner = Schlechtläufer – Gutläufer (characteristic of propulsion of goods wagon); poorly-pouring goods – well-pouring goods = Schlechtschüttende Güter – Gutschüttende Güter; a powerful locomotive – a low-power locomotive = Großlokomotive – Kleinlokomotive, running, movement – layover, idle time = Lauf – Stillstand, empty running, light running/ mileage – full running/ mileage = Leerfahrt – Vollfahrt, train carrying empty stock, train of empties – train carrying full stock = Leerzug – Vollzug, high-capacity container – low-capacity container – medium-capacity container = Großbehälter – Kleinbehälter – Mittelbehälter, carrying capacity, load limit, maximum load – minimum load = Höchstbelastung – Mindestbelastung, short rail track – continuous welded rail track = Kurzschiengleis – Langschiengleis, etc. We define this type of terms as classical antonyms.

As one can see from the examples, contradictory (complementary) antonyms are widely presented in the “railway” sublanguage. Along with this type contrary antonyms also occur. Recall that contrary antonyms are the extreme members of the series, between which there are average, intermediate members and contradictory or complementary opposites complement each other to gender, so that together they form a single concept and do not have the intermediate member. The generic concept has two aspects, so the denial of one of them provides the content of the other. Examples of contrary antonyms: the minimum speed (rolling-stock) – normal speed – maximum speed = Mindestgeschwindigkeit – Normalgeschwindigkeit – Höchstgeschwindigkeit; outside rolling bearing – intermediate rolling bearing – front rolling bearing = Außenlager – Zwischenlager Vorderlager; front axle – centre axle – rear axle = Vorderradsatz – Mittellradsatz – Hinterradsatz; front (head) car (wagon) – centre trailer (wagon) – intermediate trailer (wagon) – last (tail) wagon = Vorderwagen – Mittelwagen – Zwischenwagen-Endwagen; span (bridge) – centre span (bridge) – intermediate span (bridge) – last (terminal) span (bridge) = Öffnung – Mittelöffnung – Zwischenöffnung – Endöffnung; outside rail – inside rail – centre rail = Außenschiene – Innenschiene – Mittelschiene.

Proceeding from the above examples, antonyms of the “railroad” sublanguage are subdivided into four types: a) antonyms expressing qualitative

contrast; b) antonyms expressing the opposite spatial localization of objects; c) antonyms containing temporal properties of objects and d) antonyms expressing spatial opposite-direction of the name of an action.

The classification of terms advanced by us seems to be quite complete because according to our observations the concepts of one and the same essence they are referred to are not only opposed to each other, but also mutually suppose, complementing each other to generic so that together they form a single concept. The generic concept has two aspects, so the opposition of one to another provides the content of the other. Both real objects and abstract concepts can stand behind the terms-antonyms. Nominative constructions of this category of terms in the German language structurally belong to one and the same part of speech and are presented by compound words Adv. (Adverb) + S and Adj. + S, in Russian parts of speech mentioned above are word combinations.

### Conclusion

The classification of terms advanced by us seems to be quite complete because according to our observations the concepts of one and the same essence they are referred to are not only opposed to each other, but also mutually suppose, complementing each other to generic so that together they form a single concept. The generic concept has two aspects, so the opposition of one to another provides the content of the other. Both real objects and abstract concepts can stand behind the terms-antonyms. Nominative constructions of this category of terms in the German language structurally belong to one and the same part of speech and are presented by compound words Adv. (Adverb) + S and Adj. + S, in Russian parts of speech mentioned above are word combinations.

The classification of terms advanced by us seems to be quite complete because according to our observations the concepts of one and the same essence they are referred to are not only opposed to each other, but also mutually suppose, complementing each other to generic so that together they form a single concept. The generic concept has two aspects, so the opposition of one to another provides the content of the other. Both real objects and abstract concepts can stand behind the terms-antonyms. Nominative constructions of this category of terms in the German language structurally belong to one and the same part of speech and are presented by compound words Adv. (Adverb) + S and Adj. + S, in Russian parts of speech mentioned above are word combinations. Our last contribution goes beyond language, demonstrating negation effects in the visual mode—from road signs to modern art. Giora, Heruti, Metuki and Fein show that visual ‘negation’ symbols, such as crossing through another symbol, operate in much the same way as morphological negation and have the same effects in the interpretation process (Giora, 2006: 17). That is to say, in visual negation, like linguistic negation, the negated element is not unconditionally discarded in comprehending the message, but retained and discourse governed. Thus we can see that the principles and processes involved in the interpretation of negated messages are general communicative principles and communicative/conceptual processes. These articles demonstrate both the richness of the lexical contrast phenomena and the opportunity for further investigations. We look forward to organizing future conference sessions and networked discussions on these matters. In the meantime, we invite those interested to visit the website for Complexica, the Comparative Lexical Relations research group (<http://www.f.waseda.jp/vicky/complexica/>), which serves as a clearinghouse for information on ongoing studies on all aspects of semantic lexical relations.

### References

- Artemov V. A. (1956) *Eksperimentalnaya fonetika* [Experimental phonetics]. Moscow. 1956. 227 p. (In Russian).
- Averbukh K. YA. (1985) Standartizatsiya terminologii: nekotoryye itogi i perspektivy (k 50-letiyu deyatel'nosti po standartizatsii terminologii). Moskva: Nauchno-tekhnicheskaya informatsiya. Ser. I, № 3. 1985. 1-8 p. (In Russian)
- Azimov A. N., Desheriyev YU. D., Nikol'skiy L. B., Stepanov G. V., Shveytser A. V. 9 (1976) *Sovremennoye obshchestvennoye razvitiye, nauchno-tekhnicheskaya revolyutsiya i yazyk*. Moskva: Nauka, 1976, № 2. 3-11p (In Russian)
- Babkin A. M. (1977) *Idiomatika (frazzeologiya) v yazyke i slovare* [Idiomatics (phraseology) in language and the dictionary] Modern Russian lexicography. Leningrad. P. 4-19 (in Russian)
- Chernyshova L. A. (2010) *Otraslevaya terminologiya v svete antropotsentricheskoy paradigmy* Monograph. Moskva. MGOU, 2010. 206 p. (In Russian)
- Electronic dictionary of railway terms: <http://www.rzdl7.by.ru/terms/2.htm#nm26>.

- Franziskus Geeb. (1998) Semantische und enzyklopädische Informationen in Fachwörterbüchern: Eine Untersuchung zu fachinformativen Informationstypen mit besonderer Berücksichtigung wortgebundener Darstellungen. Inst. für Lexikographie und Computerlinguistik. – Handelshøjskolen: Dissertation. 1998. ISBN: 87-89695-34-8. 283 p. (In German)
- Fridman N.A. (1988). German-Russian railway dictionary. Moscow: Russian language, 1988. UIC (2005) Railway Dictionary English, Français, Deutsch. Paris: Internationaler Eisenbahnverband, 2005.
- Gerd A.S. Prikladnaya lingvistika. (2005) S-Peterburg: S. Peterburgskogo university, 2005. 268 p. (In Russian)
- Golovin B.N. (1970) O nekotorykh zadachakh i tematike issledovaniya nauchnoy i nauchno-tekhnicheskoy terminologii. Moskva: Gor'kovskogo university, 1970. 17-26p. (In Russian)
- Golovin B.N. (1972) O nekotorykh problemakh izucheniya termina. Moskva: Vestnik MGU
- Moiseyev A.I. (1990) O yazykovoy prirode termina. Slovoobrazovaniye. Stilistika. Tekst.- Kazan'. 1990, 89-96 p. (In Russian)
- Maslova V.A. (2004) Lingvokulturologiya Cultural linguistics. Moscow: Akademiya, 208 p. (in Russian)
- Odinokova G.I. (2006) K voprosu o tipakh antonimicheskikh protivopolozhnostey v terminologii. SH Mezhdunarodnyye Boduonovskie chteniya. I.A. Boduen de Kurtene i sovremennyye problemy teoreticheskogo i prikladnogo yazykoznaviya. Kazan'. 2006. 217 p. (In Russian)
- Wills W. (1979) Fachsprache und Übersetzen Terminologie als angewandte Sprachwissenschaft. München. New-York; London; Paris, 1979. (In German)

### Литература

- Чернышова Л.А. Отраслевая терминология в свете антропоцентрической парадигмы Монография. – Москва: МГОУ, 2010. – 206 с.
- Головин Б.Н. О некоторых задачах и тематике исследования научной и научно-технической терминологии. – Москва: Горьковский университет, 1970. – С. 17-26.
- Авербух К.Я. Стандартизация терминологии: некоторые итоги и перспективы (к 50-летию деятельности по стандартизации терминологии). – Москва: Научно-техническая информация. Сер.1. – № 3. – 1985. – С. 1-8.
- Азимов А.Н. Дешериев Ю.Д., Никольский Л.Б., Степанов Г.В., Швейцер А.В. Современное общественное развитие, научно-техническая революция и язык. – Москва: Наука, 1976. – № 2. – С. 3-11.
- Герд А.С. Прикладная лингвистика. -Петербургского университета, 2005. – 268 с.
- Wills W. Fachsprache und Übersetzen // Terminologie als angewandte Sprachwissenschaft. München – New-York; London; Paris, 1979.
- Головин Б.Н. О некоторых проблемах изучения термина. – Москва: Вестник МГУ. Сер. Филология, – 1972. – № 5. – 16 с.
- Головин Б.Н. Типы терминосистем и основания их различия. В кн.: Термин и слово. – Горький: Межвузовский сборник, 1981. – С. 8.
- Моисеев А.И. О языковой природе термина. Словообразование. Стилистика. Текст. –Казань, 1990. – С. 89-96.
- Одинокова Г.И. К вопросу о типах антонимических противоположностей в терминологии. III Международные Бодуновские чтения. И.А.Бодуэн де Куртенэ и современные проблемы теоретического и прикладного языкознания. – Казань, 2006. –217.
- Артемов В.А. Экспериментальная фонетика. – М., 1956. – 227 с.
- Маслова В.А. Лингвокультурология: Учеб. Пособие для студ. высш. учеб. заведений. – 2-е изд., стереотип. – М.: Издательский центр “Академия”, 2004. – 208 с.
- Бабкин А.М. Идиоматика (фразеология) в языке и словаре // Современная русская лексикография: 1977 / Отв. ред. А.М. Бабкин. – Л., 1979. – С. 4-19.
- Franziskus Geeb. Dissertation: Semantische und enzyklopädische Informationen in Fachwörterbüchern: Eine Untersuchung zu fachinformativen Informationstypen mit besonderer Berücksichtigung wortgebundener Darstellungen. Inst. für Lexikographie und Computerlinguistik. – Handelshøjskolen: 1998. ISBN: 87-89695-34-8. – 283 с.
- Электронный словарь железнодорожных терминов: <http://www.rzdl7.by.ru/terms/2.htm#nm26>: Фридмана Н.А. Немецко-русский железнодорожный словарь. – Москва: Русский язык, 1988.
- UIC Railway Dictionary English – Français – Deutsch. – Paris: Internationaler Eisenbahnverband, 2005.