SINKING about and WORKING with MARITIME LANGUAGE and TERMINOLOGY

Sinking about and Working with Maritime Language and Terminology

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Abstract

Maritime English (ME), the international working language in the maritime industry, is a Language for Special Purpose (LSP) of which a spoken variant, SMCP, acts as a controlled safety language. Text-based studies of Maritime English, although scarce, point to a concise syntax and grammar, a formal and impersonal style and a preference for nouns and nominal groups. Using the theory of LSP, the thesis finds that depending on content, situation and subdomain, ME can firstly be seen as restrictive language mode; secondly as a deviant language mode; and thirdly as a preferred language mode. More corpus-based descriptive research into the linguistic features of written ME and of the spoken version (SMCP) is advised. As terms typically belong to LSP, the thesis looks into the theory and methodology of terminology. They can be of assistance in setting up a corporate Terminology Management System. The terminological principles of concept structure, precise concept/term definitions and source and context information help create a reliable knowledge database. Focussing on maritime terminology, the thesis concludes with a case study illustrating how a structured approach to maritime terminology processing with the help of a terminology management tool results in a consistent corporate terminology and more reliable information benefitting translation quality. These tools should be freely available, easy to operate and should use standardized database exchange formats. More research is needed on the use of pictures in terminology including their "translatability" and their role in the information exchange.

Keywords

Maritime English; SMCP; Language for Special Purpose; Terminology; Concept Structure; Term Extraction; Terminology Management System, Standardization

***Thinking*, not sinking**

Terminology? Imagine a rough winter evening in the German Bight: wind northwest 8, rain showers, visibility poor, significant wave height 6 metres. The young German Coastguard operator in Brunsbüttel has just been handed over the watch from his colleague, when he receives an emergency VHF message in English, "Mayday, Mayday, Mayday. We are … " The signal is lost in static, then becomes louder again, "..llo, can you hear us? We are sinking! We are sinking! - Over" The coastguard operator jumps to his VHF set and answers in a light panic, his accent becoming worse, "Hello! This is the German coast guard." The vessel in distress calls again, "We are sinking, we are sinking." The operator answers, "What are you thinking about?[1]"

Thanks

To Nadine Vos (Havenbedrijf Rotterdam), Nicolien de Koning (Business Translation Services), Clarinda van den Bor (Nederlandse loodsencorporatie), Celina van Hees, Ralph Jansen and Sabrina Schipper-Wessling (Nederlands Loodswezen) for their cooperation on terminology; Hennie van der Vliet (NedTerm) for his advice and Tony Foster (Leiden University) for his supervision; and last but not least Marianne, who prefers actions to words (or terms), for her endless patience and support.

[1] Retrieved from *YouTube* (Berlitz, 2013).

Contents

Introduction

Concrete ideas for a thesis on maritime terminology presented itself in Brussels in 2013 on the yearly TiNT[2] conference on terminology in the Dutch-speaking regions. During the conference, the Nederlandse Taalunie and the software company CrossLang in Ghent, Belgium, reported on their joint initiative in the development of a new freely available terminology management system (TMS) for enterprises and individual translators, to be delivered in March 2014.

I found the Nederlandse Taalunie and two Dutch maritime organizations, namely Havenbedrijf Rotterdam (including the translation company Business Translation Services that works for Havenbedrijf Rotterdam) and Nederlands Loodswezen willing to cooperate in a thesis project on practical aspects of Dutch-English maritime terminology processing and terminology management. The CrossLang TMS would be used as a practical tool for introducing and implementing terminology management in their organisations.

March 2014, however, it became clear that the Nederlandse Taalunie/CrossLang TMS would not be ready before the thesis deadline and the part of the case study involving cooperation and feedback from the maritime companies on its use and implementation had to be abandoned. Luckily, the principles of terminology processing via a TMS could be included and illustrated in the thesis via the commercial desktop terminology management tool SDL MultiTerm 2011.

The thesis has a combined theoretical and case study approach and seeks to answer the questions whether Maritime English can be considered as a Language for Special Purpose; and whether the use of a terminology management system generates more

[2] Terminologie in het Nederlandse taalgebied.

accurate and easier-to-access maritime terminology for in-company users, authors and translators than the use of bilingual word lists or glossaries with the help of, for instance, Microsoft Excel.

Chapter 1 describes Maritime English, the international working language in the maritime industry. Chapter 2 presents the theory of Language for Special Purpose in relation to Maritime English. Chapters 3 and 4 deal with the theory of Terminology and the methodology of Terminology respectively. Chapter 5 is the case study part and focusses on issues of practical terminology management for Havenbedrijf Rotterdam, Business translation Services and Nederlands Loodswezen. The thesis ends with a conclusion. Some examples of maritime terminological entries in SDL MultiTerm 2011 (in the form of printouts) are presented in the Appendices.

1. Maritime language

1.1 General and special language

General language or *Language for General Purpose* (LGP) is the spoken and written language used by ordinary people in everyday situations (Bowker & Pearson, 2002, p.25). This definition is quite vague and that is why Maia (2003) remarks that, "[t]he difficulties in defining [general language] relate to descriptions like 'everyday language', and 'language that any normal person can understand', since they call into question the meaning of 'everyday' and 'normal person'." (p. 4). In contrast to general language, special language or *Language for Special Purpose* (LSP) is the language that is used in a special field of knowledge. Every language has both LGP and LSP. In fact it is more accurate to talk about LSP in the plural since different LSPs are used to describe different areas of specialized knowledge (Bowker & Pearson, 2002). LSP is directly related to the terminology used in communication between experts. LGP is not suitable for communication in special subject fields; it will cause confusion and miscommunication. Miscommunication can be caused by a lack of linguistic knowledge (the coastguard operator's English is a little bit too *Germish*), but also by a lack of specialized knowledge or jargon. This thesis will concentrate on the maritime domain and will first go deeper into the subject of Maritime English.

1.2 Maritime English as a language for special purpose

Maritime accidents, illustrated by Berlitz's *German Coastguard* (thesis p. 3) prompted the International Maritime Organization (IMO), the UN agency for the safety and security of shipping, to adopt English as the maritime safety language in 1995. Maritime English (ME), however, is not restricted to seafarers and shore-based staff; "the range of situations in the maritime field in which English is the medium of communication, either oral or written, is much wider" (Franceschi, 2014; p. 78). ME consists of a broad set of LSPs, not only for use at sea, in the offshore

industry or in shipbuilding, but also in maritime businesses, insurance companies and law firms. ME is further used in IMO and governmental bodies, in manuals, specialised journals and in institutions for specialised education[3]. ME is a series "of specialized (mainly, technical) sublanguages interacting among themselves to describe in the most appropriate manner all material and non-material entities known in maritime affairs" (Demydenko, 2012, p. 253).

What are the characteristics of ME? Reguzzoni (2012) carried out research on the basis of corpus analysis. A corpus is a collection of authentic texts, selected and compiled in electronic form according to specific criteria. The electronic format enables processing by various kinds of corpus tools (specialized computer software) to carry out linguistic analyses on the sampled material. As the *British National Corpus* explains on its webpage, "[w]ith the development of computing technology able to store and handle massive amounts of linguistic evidence, it has become possible to base linguistic judgment on something far greater and far more varied than any one individual's personal experience or intuitions." (BNC, 2009). The *British National Corpus* is a general-purpose corpus and not suitable for research into ME.

Reguzzoni states that, "Very little, if any, is known about Maritime English, research [is] almost non-existent [and there are] no field-specific corpora available" (Reguzzoni, 2012, p. 21). Franceschi (2014, p. 78) is of the same opinion; "What is still missing is a comprehensive study of the features of Maritime English from a strictly linguistic rather than pedagogical perspective."[4] Another recent contribution

3 "Maritime English appears as a course module in places as diverse as the Maritime Academy in Kiev, Ukraine, the Department of Maritime Transport in Istanbul or the Maritime University at Dalian, China" (Maritime English, 2014).

4 Research into Maritime English is also inspired or carried out by the organization Maritime Tests of English Language (MarTEL, 2014).

to ME is *On Nominalization in Maritime Discourse* (Raluca, 2013), based on written language. The details of Reguzzoni's corpus are presented in the two tables. The first one gives an overview of the numbers of texts and words.

CORPUS STATISTICS	
Sub-corpora	Count
Texts	185
Average length of texts	280 running words
Pages	96
Tokens/Running words	51,823 (WinATA count)
Types	5,831
Hapax legomena	2,528
Types occurring less than 9 times	5,013

Figure 1: Maritime English - Corpus Statistics (Reguzzoni, 2012, p. 24).

The second table below gives some particulars per sub-corpus.

SUB-CORPORA DESCRIPTION	TOKEN COUNT	TYPE COUNT
1. Basic Ship Terminology	1,771	455
2. Ship Types	1,255	416
3. Ship Particulars	1,010	314
4. Manning	2,057	541
5. The History of the Ship	2,323	747
6. Famous Ships	5,956	1,659
7. Shipbuilding	1,235	509
8. Miscellanea: Structural Elements and Shipboard Plants	2,583	775
9. Technical Specification (4)	9,482	1,984
10. IMO/Classification Societies	2,958	874
11. Marine Pollution	3,642	1,115
12. Marine Meteorology	6,134	1,515
13. Port Operations	3,153	750
14. Collision Regulations	8,264	997

Figure 2: Maritime English - Sub-corpora description (Reguzzoni, 2012, p. 25).

Reguzzoni found that the ME lexicon was hardly unique per se, as it mainly consisted of LGP words that had entered into the realm of ME. She found that in 20% of the cases these words had taken on a different, specialized meaning through polysemy and homonymy (p. 28). For instance, the English word *port* in LGP may indicate a harbour, but in ME *port* can mean an opening in the hull [a small round window, ES] as well as the left side of the ship (p. 30).

Reguzzoni also showed that words imported in ME take on a different, specialized meaning through the forming of new compound words. In maritime discourse, compactness and speed of information and communication are very important and as compounds are able to absorb a great amount of semantic and syntactic information (Raluca, 2013) they make communication more effective. Take, for example, the compound word *air draught* (Reguzzoni, 2012, p. 30). The two words *air* and *draught* are two well-known words in LGP, but the *air draught*[5] in ME is the height of a ship taken from the waterline to the top of the mast (Sullivan, 1999). A small part of Reguzzoni's ME lexicon consists of clippings, initials and acronyms (p. 36). Examples are: bo's'n, bo'sun or bosun (for *boatswain*)[6], fo'c's'le (for *forecastle*)[7], AB (*Able Seaman*), SOLAS (*the International Convention for the Safety of Life at Sea 1974*) [explanations ES]. Obviously, these short forms are also meant to speed up communication.

1.2.1 Maritime English as a controlled language

After the IMO had declared English as the maritime safety language in 1995, it developed and introduced Standard Marine Communication Phrases (SMCP) in 2001. This was done to further standardize the information process and minimize

[5] Compare *draught*, the depth of the submerged part of a ship (Sullivan, 1999).

[6] *Boatswain*, a petty officer who is in charge of the deck crew of a ship and who in turn comes under the direct orders of the chief officer or the captain (Sullivan, 1999).

[7] *Forecastle*, a short raised deck at the front of a ship (SOED, 2006).

the chances of miscommunication in safety-related verbal communications. SMCP, also defined as "a specific, narrow-scope realisation of Maritime English" (Bocanegra-Valle, 2010, p. 37), is used especially for communication at sea, in port approaches, and on board vessels with multilingual crews. It is a form of Controlled Language (CL) often used for operational purposes and described as "a language which reflects an operational behaviour depending on what the speaker intends and how the listener will interpret this utterance. Operational (empirical) definitions attempt to specify operations coming along with observational data." (Demydenko, 2012, p. 250). Below are some examples of operational messages (cargo handling) in SMCP format from SMCP Part B3/1.3.3 (IMO, 2002).

Leak at manifold connection!
Stand by oil clearance team and report.
Oil clearance team standing by.
All crew assist to remove the spill.
Spill cleaned up.

Figure 3: IMO SMCP operational format for cargo handling, "reporting and cleaning up spillage".

A CL is a version of human language with explicit restrictions on vocabulary, grammar and style for the purpose of simplifying communication and translation (Quah, 2006, p. 48). With roots in the Simplified English of the 1930s, CL aims to minimize ambiguity and maximize clarity for human language users, including non-native speakers of English (Hartley, 2009, p. 115). For that purpose SMCP uses a fixed format and prescribed terminology with the following features:

- Avoiding *the, a/an, is/are, may, might, should, can, could*.
- Avoiding synonyms and contracted forms.
- Providing fully worded answers to *yes/no*-questions.
- Providing one phrase for one event.

Below are examples of distress messages in SMCP-controlled format from SMCP Part A1/1.1.6 (IMO, 2002):

I am sinking after collision.
I require assistance.
I am proceeding to your assistance.
ETA at distress position at ... hours UTC.

Figure 4: IMO SMCP controlled format for external distress messages, "sinking".

The controlled format is also used for on board communications; the following are examples of on board emergency situations from SMCP Part B2/5.2 (IMO, 2002):

Check flooding and report.
Flooding in ... .
Is danger imminent?
Yes, danger of heavy listing to port and breaking apart.

Figure 5: IMO SMCP controlled format for occupational safety (grounding), "reporting damage".

Operational/controlled format is also used in navigation. Below is an example taken from SMCP General 11.2 (IMO, 2002) of the format for a message containing a position indication using bearing[8] and distance from a navigation mark.

My position:
Bearing: one-eight-three degrees,
From IJmuiden Centre buoy,
Distance: four decimal four miles.

Figure 6: IMO SMCP controlled format for "bearing and distance from a navigation mark".

For navigation messages the format from SMCP General 11 and 12 must be used:

[8] In nautical science, bearing is the compass direction from a ship to an object such as a lighthouse or a buoy.

- The word *position* is to be spoken first.
- The word *from* is to be spoken before the name of the point of reference.
- The word *bearing* is to be spoken before the numbers; units are degrees true in the 360^0 notation; etc., etc.

The absence of articles is visible in Safety Communications on meteorological and hydrological conditions in SMCP Part A1/3.1.1 (IMO, 2002), winds, storms, etc.:

QUESTION:
What is wind direction and force in your position?
OVER

Figure 7: IMO SMCP controlled format wind indication - "question".

ANSWER:
Wind direction northwest, force Beaufort 5 in my position.
OUT

Figure 8: IMO SMCP controlled format wind indication - "answer".

The two examples above show one of the most outstanding *controlled* features in IMO SMCP, namely the use of *Question*, *Answer*, *Over* and *Out*. These are so-called *Message Markers* and *Basic Words*. Message Markers are the following words: *Instruction, Advice, Warning, Information, Question, Answer, Request, Intention*; Basic Words are the following ones: *Over, Out, Understood, Stand By, Positive, Negative, Correction, Say Again,* and *I Repeat*.

Both classes of indicators precede or conclude a message and thus increase the probability that both purpose *and* content of the message are properly heard *and* understood SMCP-General 3, 18 and A1/6 (IMO, 2002).
Below is an example of the format for a question from SMCP Part B1/1.1.3.

QUESTION:
What is your air draft?
OVER

Figure 9: IMO SMCP controlled format for posing a question (draft/draught, see footnote No. 5).

The use of the *Question* marker at the beginning of the question indicates that the message which follows is of an interrogative character and not merely a statement. Receiving stations are required to use the SMCP Message Marker *Answer*.

ANSWER:
My air draft is three five decimal five zero metres.
OUT

Figure 10: IMO SMCP controlled format for answering (including the spelling of numbers).

Basic Words are included in the message format, the examples above use the Basic Words *Over* (indicates the end of a transmission - the other station is now expected to reply) and *Out* (indicates the end of a transmission - the other station is *not* expected to reply).

1.3 Dutch maritime language as a language for special purpose

Dutch maritime language, like ME, is a language for special purpose. Due to its status of international maritime working language, ME is the dominant language in most maritime domains. Dutch, however, has been appointed as the official working language in the domain of traffic control in the Dutch ports and English and German are the official secondary languages. Dutch maritime language does not play a prominent role in international maritime business-related domains and the translation direction is mainly from Dutch to English. ME and SMCP, including their terminologies, are taught at Dutch nautical colleges. They have been translated into Dutch for educational purposes by Van Kluijven, Konijn, and Kuyper-Heeres, teachers of Maritime English, in 2004. The Dutch translation has been recognized by the Dutch Ministry of Infrastructure and the Environment.

2. The theory of language for special purpose

2.1 Language for special purpose is a sublanguage

In linguistics, a sublanguage (also called specialized language, jargon or LSP) is associated with a specific group or context. A sublanguage functions in a specialized sub domain within or alongside the normal everyday language (LGP). LSPs are not necessarily restricted to the domains of science or profession; also languages used in relation to hobbies, sports, games, etc., qualify as LSPs, although Sager et al. (as cited in Cabré, 1999, p. 64) argue that in that case "all language could be split into so many sublanguages and the word 'special' would be superfluous." Newer communicative approaches to terminology tend to deny the strict division between general and specialized language (Maia, 2003).

2.2 General and special language - differences

LSP differs on lexical, grammatical and pragmatic levels from LGP. The difference between the two is a difference of degree rather than kind, namely the degree to which the fundamental characteristics of language are maximized or minimized in LSP usually for reasons of simplifying and standardizing the communication and avoiding ambiguity. The study of the relations between LGP and LSP has given rise to opposing views. Some say that LGP and LSP constitute two autonomous and opposing sets; others say there is an intersecting relationship; a third view, which is shared by Martin & ten Pas (1991), is that LGP and LSP are intersecting sets which together form the broader set of the language in its entirety; between the two sets are continuous exchanges in both directions. These exchanges or overlaps exist in the first place because LGP elements are necessary to communicate in LSP; in the second place because it lies in the dynamic character of languages to allow characteristics of one language to be taken over by the other and vice versa. This process not only occurs between LSP and LGP but also between related LSPs such as variants of ME mentioned by Demydenko (2012, p. 253). The boundaries between

the languages are flexible ones and their overlaps can be schematized as in figure 11 below (Martin & Ten Pas, 1991, p. 363; Cabré, 1999, p. 62).

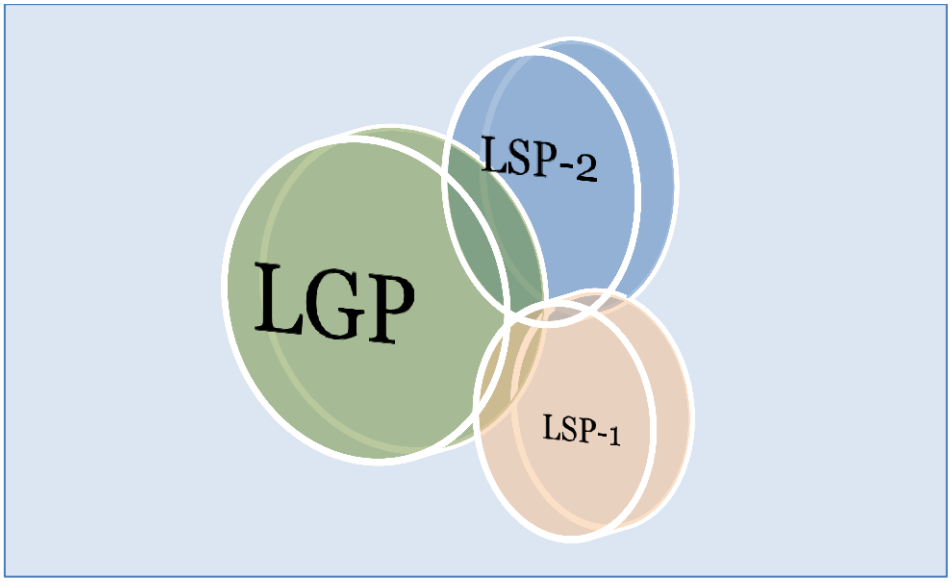

Figure 11: Schematic overlaps of LGP, LSP-1 and LSP-2.

The phenomenon when terms[9] make their way from LSP to LGP is called de-terminologisation by Meyer and Mackintosh (as cited in Bowker & Pearson, 2002, p. 26) and will usually cause a semantic shift. The following examples illustrate a broadening of the original meaning: the maritime term *by and large* originally meant that a well-designed sailing vessel could sail both *by* (into) and *large* (with the wind). In LGP it has come to mean *generally speaking*.

A Dutch maritime term that has entered LGP is *poolshoogte nemen*. The original term indicated position-finding by measuring the height of the Pole Star (astro navigation). This height directly relates to the observer's latitude on the northern hemisphere. In LGP its meaning has widened to: *size up the situation*.[10]

[9] Terms are the words (single words or multiword units) used in a specialised domain with a clearly defined meaning (Bowker & Pearson, 2002, p. 233).
[10] According to Van Dale.

Conversely, when LGP words are borrowed in LSP it is called *terminologisation* and also implies a semantic shift. Compare the following: the LGP word *separator* is narrowed down in LSP to indicate a device in the engine room of a ship for separation (and cleaning) of oily water. Reguzzoni mentions these shifts in her ME corpus research (thesis chapter 1.2).

2.3 Differences with regard to language variations

As a rule, LGP and LSP are not homogeneous and can be characterized by a number of language versions or variations that can be divided into the following categories: regional and social language variations; language variations due to time or period; variations due to content, function or purpose; and language variations due to the communicative situation.

2.3.1 Regional and social variations

Because the main purpose of LSP is communication between experts, the range of variation due to dialect or class in LSP is much narrower than in LGP. In Dutch maritime LSP the following examples indicate regional variations for terminology used to describe a specific manoeuvre carried out by ships entering the port:[11]

Figure 12: Regional variations (Rotterdam and Flushing) in Dutch maritime LSP.

Rotterdam and Flushing also use different terms to indicate their pilot vessels.

[11] Information obtained from Nederlands Loodswezen.

A kind of social variation exists in LSP used by inland and sea-going ships:[12]

Ik ga keren over bakboord (inland shipping)	*Ik ga rond over bakboord* (sea-going shipping)

Figure 13: Social variation (inland and sea-going shipping) in Dutch maritime LSP.

2.3.2 Variations due to time or period

Innovations in a knowledge domain create new terms, such as *azipod* (1987)[13], *havenontvangstinstallatie* (2007)[14] and *bijlboeg* (2011)[15]. Specialised texts produced at different points in time may show how the domain developed. Below are two texts on the definition of a ship's length. The first is from the Merchant Shipping Act 1894 and the second from The Merchant Shipping Regulations 1988. The variation in LSP has probably been influenced by technology progress (*planks* and *timber* suggest wooden ships in 1894 vs. steel ships in 1988).

Measure the length of the ship in a straight line
along the upper side of the tonnage deck
from the inside of the **inner plank** (average thickness)
at the side of the stem
to the inside of the midship **stern timber or plank** there, as the case maybe
(average thickness)

Figure 14: Length, Rule 1, Merchant Shipping Act 1894, Irish Statute Book.

[12] Information obtained from Amsterdam Port Control.

[13] Azipod is a propulsion unit consisting of a propeller mounted on a steerable gondola or pod.

[14] Port Reception Facility for ship-generated waste.

[15] The axe bow is a modern type of a ship's bow.

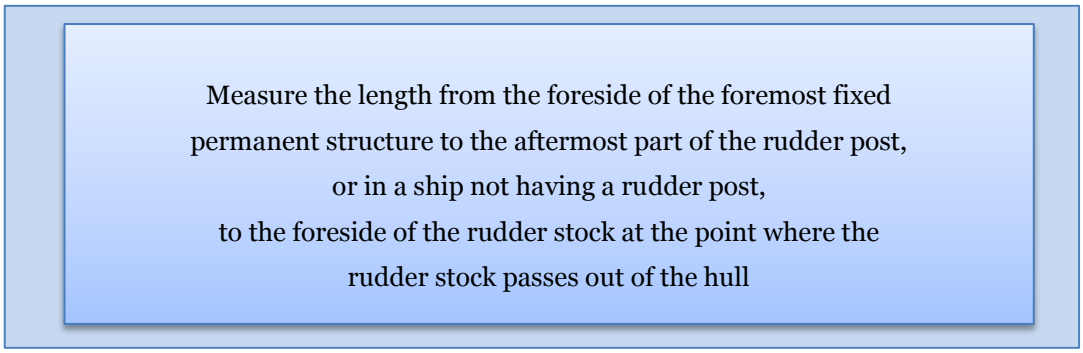

Figure 15: Length, Regulation 4, UK Merchant Shipping Regulations 1988 - SI 1988 No. 1909.

2.3.3 Variations due to content, function or purpose

LGP and LSP differ, in particular, in the way they show variations in content or purpose of the message. Regarding the content of the message, it will be obvious that LSPs differ per knowledge domain. Also lexical and semantic patterns will show variation. Compare maritime LSP in the form of a Notice to Mariners[16] with a fragment of a legal text from the York-Antwerp Rules:[17]

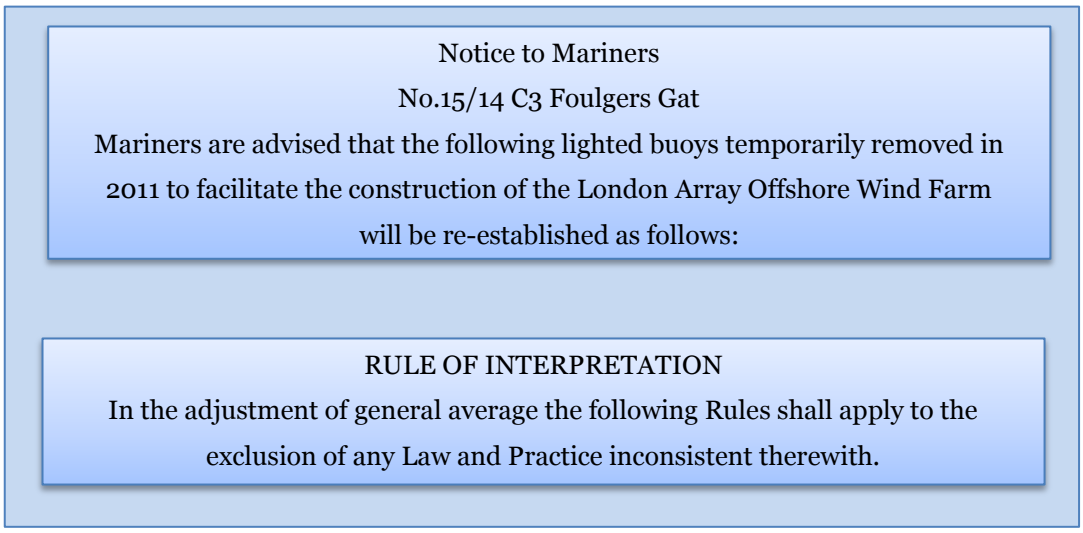

Figure 16: LSP variation between a Notice to Mariners and the York-Antwerp Rules.

[16] Notices to Mariners provide essential, up to date information and advice to those navigating in the area. Trinity House is the UK Lighthouse Administration. This Notice is retrieved from their website (Notice To Mariners, 2014).

[17] York Antwerp Rules is the codification of the legal principle of maritime law called general average. This Rule is retrieved from the website (York Antwerp Rules, 2010).

Purpose and function of the message are important. LSP users may use a variety of language, a *register* (Baker, 2011), which they consider appropriate to the specific situation. With regard to content, register variations comprise *field* (what is being written about) and *mode* (written or spoken, or formal or informal language). Finally, language variation may arise from syntactical variation through marked language. *Markedness* (Munday, 2012) relates to a choice of patterns that stand out as unusual and may come to the reader's attention. Compare, for instance, the syntactical variation in LSP in the texts on *anchoring* below.

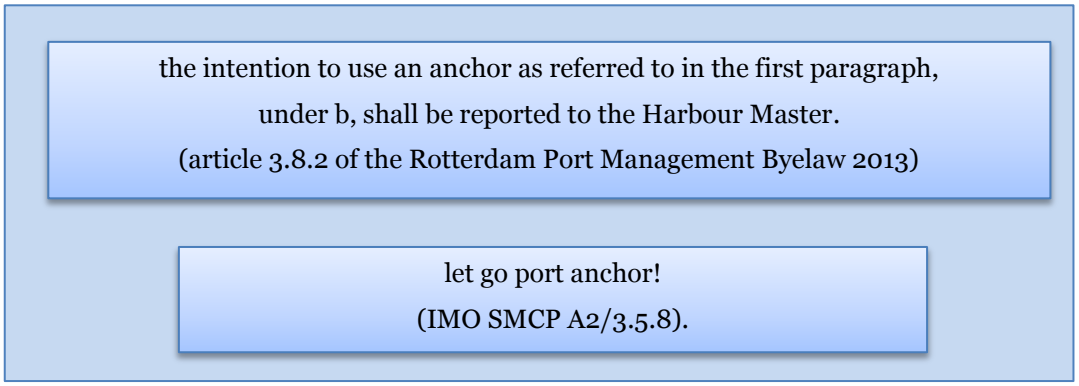

Figure 17: Variation in LSP on the theme of anchoring" between a Byelaw and SMCP.

2.3.4 Variations due to the communicative situation

Depending on the situation, language users may use a specific type of register called *tenor* suitable for that particular communicative situation. *Tenor* is an abstract term for the relationship between participants in the discourse (Baker, 2011, p. 14). LGP and LSP differ especially in the way they show variations with regard to the communicative situation. In LSP these situations can be divided into three different levels of communication with varying degrees of abstraction and specialisation (Bowker & Pearson, 2002):

1. Communication between experts of that domain (high level LSP).
2. Communication between experts of different but related domains (medium level LSP).

3. Communication between experts and laypersons, also occurring in situations involving instruction and training (low level LSP).

This observation is confirmed by Picht & Drakau (as cited in Cabré, 1999).

The Encyclopaedia Britannica Ultimate Reference Suite 2013 uses a kind of *tenor* to communicate information; compare content presentation for the entry *Harbor*:

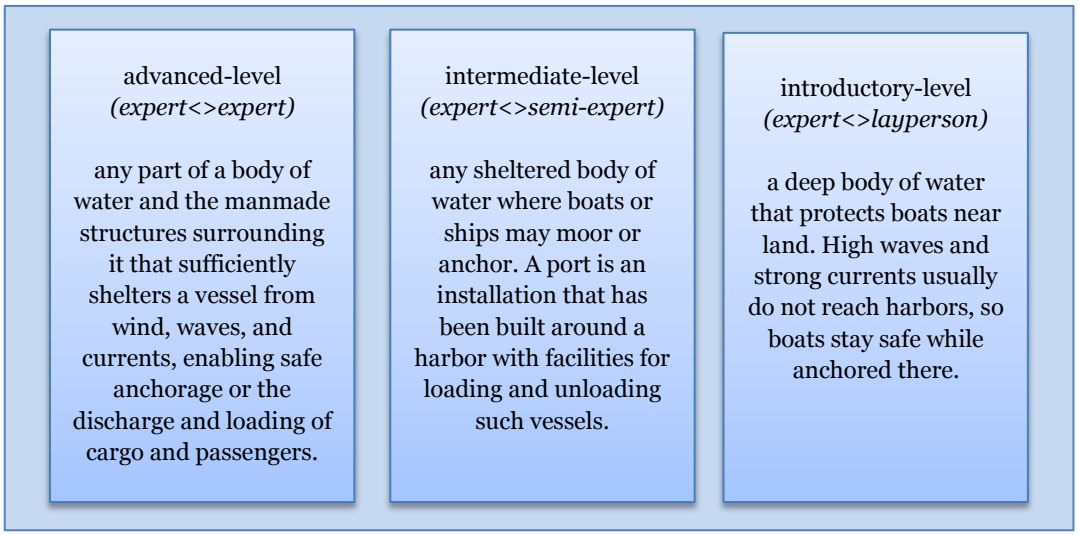

Figure 18: Language variations directed at three communicative levels for the entry *Harbor* in the Encyclopaedia Britannica (Harbor, 2013).

The three levels are called *advanced* (older students and adults), *intermediate* (students aged 10-14) and *introductory* (young students 6-10). While the examples above may not be exactly considered LSP variants, they nevertheless illustrate the idea that people use different levels of abstraction and specialisation tuned to the communicative situation. It is good to realize that laypeople communicating on special subjects will not use LSP but LGP.

An overview of the main categories of language variations, given in thesis chapters 2.3.1 to 2.3.4, is presented in the table on the next page. It shows that differences with regard to language variation between LGP and LSP mainly occur in the functional-pragmatic domain.

	Language for General Purpose	Language for Special Purpose
2.3.1 Regional variations	Is a national language, regional variations occur	Is a national language, few regional variations
2.3.1 Social variations	Laypeople and educated laypeople	Experts and semi-experts
2.3.2 Variations due to time or period	Changes in lexicon and language use are universally understood	Changes depend on new developments in that knowledge domain
2.3.3 Variations due to content	Same lexical and semantic features used for many subject domains	Different lexical and semantic features for different subject domains
2.3.3 Variations due to purpose	Same syntactical forms for different purposes	Different syntactical forms for different purposes
2.3.4 Variation due to communicative situation	Many communicative situations	restricted to expert-expert; expert-semi-expert; and expert-layperson situations

Figure 19: Comparison of the main differences with regard to language variation in LGP and LSP.

2.3.5 Lexical size

The lexical size of LSP is usually smaller than that of LGP. This is on the one hand due to the limited size of its vocabulary (its collection of terms) and on the other hand due to the fact that the lexicon of LSP is more or less complete ("closed"). Relatively modern sciences, however, or specialized organs of the EU will add new terms to their LSPs if necessary. In contrast, the lexicon of a LGP is renewing itself continuously.

2.3.6 Semantic characteristics

LSP terms (jargon words) exist next to LGP words and sometimes differences in meaning between terms and LGP words can be vague. Some differences exist solely

on the basis of preferred meanings; while others depend on the subject or the situation (see semantic shifts - broadening and narrowing - on thesis p. 17).

2.3.7 Collocations

LSP items have a more limited collocational range than LGP items. The wish to create precise, unambiguous terms narrows down the sense of a word. The collocational range of a word is influenced by its level of specificity and by its number of senses (Baker, 2011). Collocations in LSP are based on semantic combinations (Martin & Ten Pas, 1991, p. 371), rather than on the sometimes semantically and lexically unpredictable relations of words in LGP, which have a wider collocational range. For instance, the words "accommodation" and "ladder" are common words in general and maritime language, but the collocation "accommodation ladder" is only found in maritime language[18].

2.3.8 Pragmatic characteristics

The pragmatic characteristics of LSP depend, in particular, on communicative situations already mentioned in thesis chapter 2.3.4. Language variation in LSP is divided in three communicative situations, namely between experts of the same knowledge domain, between experts of different, but related domains, and between experts and laypersons. The interlocutors' level of expertise, if recognized by the experts, will influence their lexical choices as far as they are available.

2.3.9 Language for special purpose - a linguistic overview

Apart from functional-pragmatic differences, which are mainly based on content, purpose and users, linguistic differences exist on lexical, syntactic, semantic and pragmatic levels. A comparison of the linguistic characteristics of LGP and LSP can be given in the form of a table (Martin & Pas, 1991, p. 372) and (Deville, 2001, p. 6).

[18] Accommodation ladder: A gangway, a ladder with flat steps and handrails on either side enabling passengers and members of the ship's crew to embark or disembark (Sullivan, 1999).

In comparison with LGP, LSP functions according to one of the following three complementary modes:

	Lexical particulars	Syntactic particulars	Semantic particulars	Collocational particulars	Pragmatic particulars
When LSP functions as a restricted mode of LGP	LSP-lexicon is relatively closed, new terms added if necessary	some syntactic constructions that occur in LGP do not occur in LSP	strict monosemy	LSP seldom has unpredictable lexical-semantic combinations; collocations are fixed	restricted and sometimes simplified user-specific language
When LSP functions as a deviant mode of LGP	LSP-specific lexemes and/or morphemes	LSP has different language rules or constructions	LSP-specific concepts and semantic relations	restrictions on co-occurrence are LSP-specific	status labels indicate acceptability or preference in LSP
When LSP functions as a preferential mode of LGP	lexical items occurring in both LSP and LGP are distributed in different ways	different distribution of the syntactic patterns and categories	different preferential arrangement of meanings (hierarchy)	different collocational expectations	lexical choices are adapted to the interlocutors' levels of knowledge

Figure 20: lexical, syntactic, semantic, collocational and pragmatic language characteristics of sublanguage according to Martin & Ten Pas and Deville.

The restrictive mode excludes certain features of LGP. LSP can be described as a restricted form of language; e.g. the *Standard Marine Communication Phrases* leave out synonyms, contracted forms and function words (thesis chapter 1.2.1).

In the deviant mode, LSP has specific features which are not found in LGP. Compare the following sentence: *stay in the main channel until the leading light is opened. This light (FW vis 324° to 333°T) is positioned (…) by the second*

seaward pile of the Crosswall Quay pontoon. (Dover Marina, 2013, p. 29). This kind of sentence pattern is not found in LGP. The preferential mode is complementary to the restrictive and deviant modes. Both LGP and LSP have specific features (words or syntactic structures) in common, but some of these are valued higher and occur more frequently in LSP than in LGP and vice versa. The words *vessel* and *ship* occur in both LGP and LSP, but *vessel* is preferred in formal LSP texts. Regguzoni (thesis chapter 1.2) also pointed out that words and compounds taken from LGP receive special or preferred meanings in LSP; this can be illustrated by terms such as *squat,*[19] *general average*[20] and *wing tank*[21]. Dutch examples of preferred meanings in LSP are: *blinde ton,*[22] *boegschroef,*[23] *ik sla achteruit,*[24] *ik kom overstuur de haven uit*[25] (this is the so-called semantic shift discussed on page 7 of the thesis).

On the basis of the above mentioned features, the English and Dutch maritime languages can be considered LSPs. Their syntactic features, especially for SMCP, are influenced by linguistic measures aimed at creating uniform, unambiguous communication (thesis chapter 1.2.1). In other maritime subdomains they show a concise, precise and sometimes simplified syntax and grammar, a formal and impersonal style, and a preference for nouns and nominal groups. Apart from SMCP, they favour written language.

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[19] *Squat* is the bodily sinkage of a vessel.

[20] *General average* is an internationally accepted rule of the sea.

[21] *Wing tank* is a ballast tank in the side of a ship.

[22] A *blinde ton* is a *buoy without light*.

[23] A *boegschroef* is a *bow thruster*.

[24] *Ik sla achteruit* means *my engine is on astern*.

[25] *ik kom overstuur de haven uit* means *I am leaving the harbour stern first*.

3. Terminology

3.1 Terminology and translation

Newmark (1988, p. 151) states that "[t]echnical translation is primarily distinguished from other forms of translation by terminology, although terminology usually only makes up about 5-10% of a text." If it only makes up a small part of a text, what then is the "role" of terminology? Byrne (2012, p. 144) points out that "[d]espite its rather daunting appearance, terminology is generally the least problematic part of a technical translation, *provided* that you have access to the Internet and, in certain cases, to good dictionaries." Newmark and Byrne link terminology to science, technology and translation. The link to translation is also made by Bowker (2011) in the *Routledge Encyclopedia of Translation Studies*. Here terminology is seen as "the relatively young discipline concerned with the naming of concepts and terms in specialized domains of knowledge. (...), one of its most widely practised applications is in the domain of translation" (p. 287).

3.2 Early terminology

Terminology may be called a relatively young discipline, but attempts to order the science of specific domains were already undertaken by Renaissance scholars such as Dürer[26] and Vesalius[27]. Stimulated by early modern scientific discoveries, systematic terminology began in earnest in the 18th century with the taxonomist Linnaeus and the chemists Lavoisier and Berthollet. Their pioneering work was continued by others in the 19th century with a focus on the sciences and technical nomenclatures. Terminology stimulated the international exchange of knowledge and ideas. Modern developments in the 20th century activated the foundation of standardizing bodies such as the well-known International Organization for Standardization (ISO).

[26] Dürer used terminology in his treatises on mathematical forms in 1525 (Dürer, 1996).

[27] Vesalius used terminology in his monograph on anatomy in 1543 (Vesalius, 2014).

The first serious theory of terminology was developed by Eugen Wüster (1898-1977), a terminologist and lecturer at the University of Vienna, who developed a methodology for working with terminology, suggesting criteria to eliminate ambiguity. Wüster was inspired by the ideas of Esperanto, a new politically neutral constructed *interlanguage*, which aimed to eliminate vagueness and ambiguity in language. The direction in terminology called the Vienna School of Terminology is based on Wüster's ideas. "Other schools of terminology were active in those years, such as the Czech and Russian schools, although not a great deal has been written about them" (Cabré, 2000, p. 37). What is known is that Wüster's work on terminology was translated by the Soviet scientist E. K. Drezen (1892-1937), who was also an active Esperantist. Under Stalin's regime, however, Drezen was suspected of internationalism and "dangerous cosmopolitism"[28], and executed in 1937 (Halvelik, 2005). Another Soviet terminologist, D. S. Lotte (1898-1950) and a member of the Soviet Committee for Standardization, continued on Wüster's ideas. In Prague, terminology was based on the Swiss linguist and semiotician De Saussure (1857-1913).

Wüster modelled his theory of terminology on the basis of his experiences in compiling an English-French reference work (with a German supplement) which appeared in 1968 and was called *The Machine Tool. An Interlingual Dictionary of Basic Concepts*. Finally, when he was already in his seventies, he wrote his *Einfuhrung in Die Allgemeine Terminologielehre und Terminologische Lexikographie*, which was posthumously published in 1979 and translated as *The General Theory of Terminology*.

[28] Cosmopolitism: disparagement of Russian traditions and culture (SOED, 2006).

3.3 The General Theory of Terminology

In the literature on the subject, Wüster's *General Theory of Terminology* (GTT) defines the scientific principles and methods of what is now considered as the classical or traditional branch of terminology, which has as its main themes:

- The priority of the universal and independent concept "above" each term.
- The precise definition or characterisation of concepts.
- The systematic ordering of these concepts in a well-defined and interrelated structure.
- An onomasiological approach to terminology processing, in which the terminologist works from the existing concept definition towards the term[29].
- The one-to-one relationship between concept and term; a relationship defined by strict monosemy in which any form of ambiguity, synonymy or polysemy is vetoed.
- A unifying approach via standardization and internationalization of terms independent of cultural differences.
- A prescriptive approach with an emphasis on terminology and language planning.
- The belief that terminology is indispensable for the dissemination of specialized knowledge, justifying the rigid division between LGP and LSP.

At first Wüster believed that Esperanto could be the vehicle for unambiguous, standardized, international communication in technical and scientific subject fields. As it failed to do that, Wüster focused on a rigorous unifying system via terminology and that is why in the GTT universal concepts are the objects of terminology. According to Wüster, terminology is an independent discipline, combining elements of other disciplines such as ontology, logic, linguistics, information science and

[29] Onomasiology is the branch of knowledge that deals with the principles of nomenclature; the opposite of an onomasiological approach is the semasiological approach; semasiology is connected to lexicography and starts with the word, and works towards its definition.

communication science. A large part of terminology is concerned with objects in real life; it therefore borrows ideas from ontology, which studies the nature of things and their relationships in the real world. Terminology also borrows ideas from logic, namely abstraction, generalization and organisation to create classes of objects. Logic is also used in the process of elimination when specific characteristics or differences of objects have to be described. Finally, logic is used to specify and create object-concept relationships and a concept structure that shows how concepts relate to one another. Terminology is influenced by linguistics and applied linguistics, firstly, because of its interest in LGP and LSP as tools for communication, and secondly, because terms constitute a specialised subcomponent of a language's lexicon. The following branches of linguistics are involved: morphology (form, change, formation, and inflection of words in a language), lexicology (the structure and content of the lexicon), and semantics (meaning). Terminology has further borrowed from and uses techniques of information science and computer technology for storing and retrieving information and for the organization of large and complex conceptual relations or thesaurus structures. Terminology is linked to communication science for the reason that terms have to be useful communicative units which must be evaluated from the point of view of economy, precision and suitability of expression.

3.4 The status of terminology comes under discussion

Terminology is a very broad subject field; this is illustrated by the rather exhaustive definition given by *Infoterm, the International Information Centre for Terminology*[30]:

> Terminology plays a crucial role whenever specialized information and knowledge is created (e.g. in research and development), communicated (e.g. in the medical or

[30] Infoterm was founded by Wüster with the help of UNESCO in 1971.

> economic area), processed, recorded and maintained (e.g. in databases), transferred (e.g. through teaching and training), accessed (e.g. supported by indexing, using browsers in the Internet, etc.). Therefore an efficient use of terminology is essential for precise and efficient communication across language and cultural barriers, a prerequisite for translators, interpreters and localizers, indispensable for accessing information in databases or other resources, and a crucial component in virtually all standardization and harmonization activities. Terminology management has become an integral part of business processes aiming at increasing productivity, quality of products and services and user satisfaction (Infoterm, 2014).

The growing significance of terminology has, over the last decades, led to debates and opposing views among its followers as to its status, especially with regard to its principles and aims. On one side are those who claim that terminology has an independent status and rests on an original theoretical framework that deals with designation in special languages. On the other side are those that dismiss the idea that terminology is an independent discipline. Sager (1990) believes there is no substantial body of literature that supports the view that terminology is an independent discipline. In his opinion it is better called an applicable science, directed at compiling terminologies in special subject fields with the aim of optimizing communication among specialists and professionals concerned with the standardization of language. The two opposing views, schematized by Sageder (2010, p. 127), are presented in figure 21 on the next page.

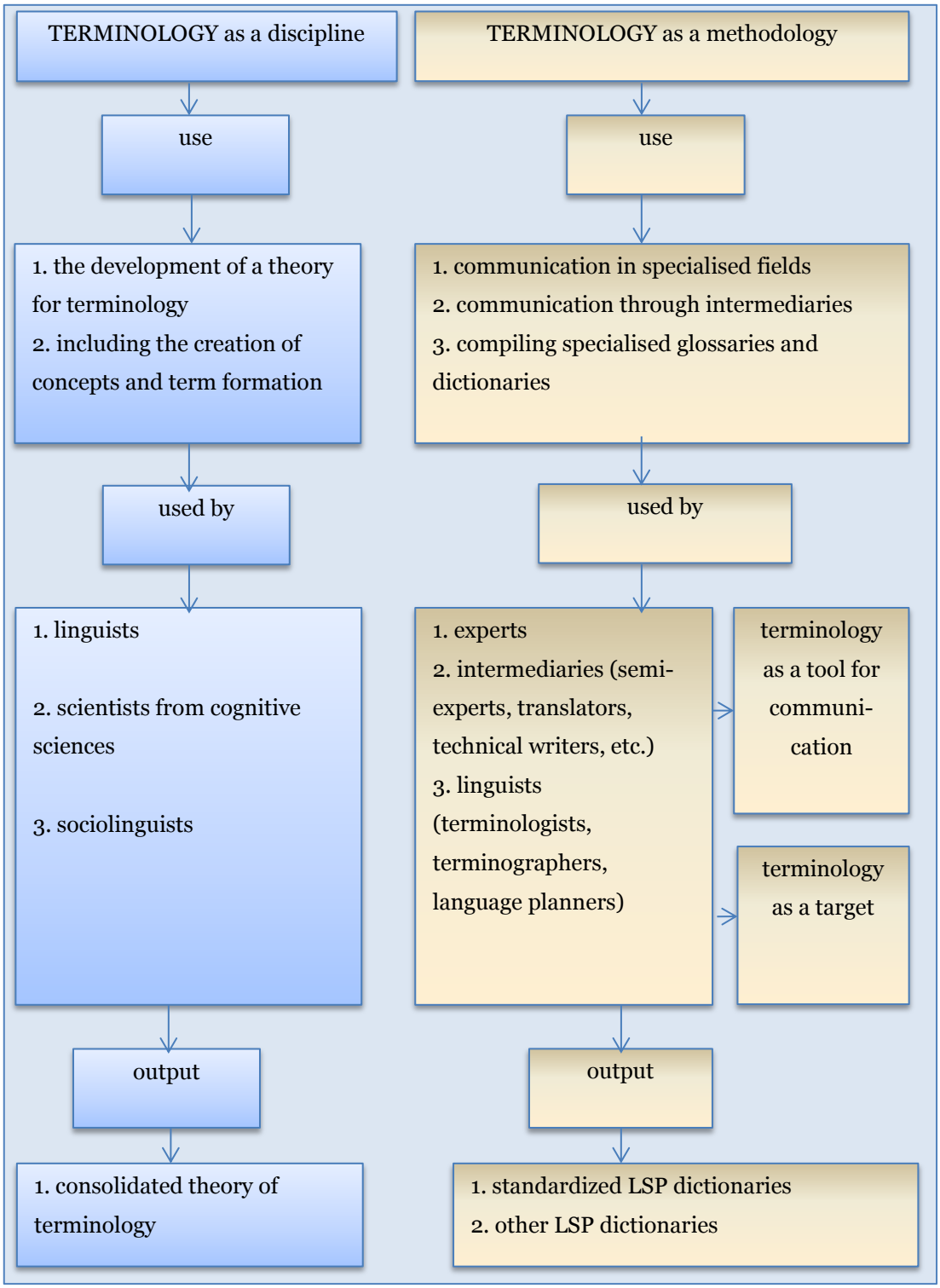


Figure 21: Sageder's diagram showing the two opposing views on terminology.

Cabré (1999) neither agrees nor disagrees with Sager. She defines terminology as an interdisciplinary field of enquiry of which the prime objects of study are the specialized words belonging to specific domains. She points out that the word

terminology refers to at least three different concepts, in the first place to the principles and conceptual bases that govern the study of terms; in the second place to guidelines used in terminology work; and finally to the set of terms in a particular special subject field. As Bowker (2011) points out, terminology has always been more closely linked to its applications and practical use than to its more theoretical aspects, suggesting a gap between science and practice. The discussion whether terminology really is a discipline (a branch of scholarly knowledge) or a methodology (applied knowledge) still continues.

3.5 Towards a new General Theory of Terminology

Most of Wüster's *General Theory of Terminology* and its scientific basis were formulated in a particular historical, scientific and technical context. This context has changed in the course of the years. Technological development in the second half of the 20th century resulted in important innovations, especially in the form of data banks and personal computers, which brought about a major change in the conditions for processing terminological data. Sager (1990) points out that through the availability of large-scale collections of experimental linguistic data it has become easier to test, support, or modify any theory of terminology. Cabré agrees with Sager, in her opinion, "terminology will only advance as a scientific field of study if those of us interested in terminology can explain our ideas and discuss them on a basis of hard data (...): their characteristics and properties, their operation in specialised discourse and how they are acquired."(2003, p. 182).

These innovations have also influenced linguistic and communication science. The GTT began to be questioned in the 1990s. The most important items that attracted criticism were its focus on standardization, the priority status of the concept, the concept-term relationship, and the perceived lack of a theoretical basis. Critical voices, mainly from the cognitive, language, and communication sciences, voiced

their opinions and came up with suggestions that ranged from adjustment of the classical theory to alternative or completely new theories.

Several specialized seminars[31] have been devoted to re-establishing the foundations of a theory of terminology either on its own or in contrast to linguistics or lexicography. In these discussions, cognitive psychology and philosophy addressed the difficulty of separating general from specialised knowledge, as general knowledge is necessary for and contributes to the acquisition of specialised knowledge. They also pointed to the fact that discourse plays a significant part in the construction of knowledge and that culture has an important influence on how we see reality (and thus concepts). Linguistics and sociolinguistics questioned the rigid division of LGP and LSP and also addressed the significance of semantics and pragmatics and pointed to the importance of text and corpus linguistics with their focus on aspects of grammar, collocation and current use of language. The communication sciences drew attention to discourse analysis and to new models of communication in which specialised communication is treated as an option rather than a different type of communication. It clearly appeared to be time to revise the GTT or to create a new, integrated theory of terminology (Cabré, 2003). This quest for an integrated theory of terminology, however, was and is hindered by traditional controversies between the various directions related to practical terminology. Controversies which too often were/are presented as contrasting opinions on the following questions:

- Should terminology be oriented towards language planning[32] or towards special communication (LSP)?

[31] Barcelona 1999, Vasa 2001, Prague 2003, Surrey 2003, Paris 2003, Lisbon 2003 (Cabré, 2003, p. 163-164)

[32] Language planning is a deliberate effort to change a language or its functions in society; to keep a language up-to-date and fit for international communication, i.e. with a modern terminology.

- Should terminology work be directed at ad-hoc terminography[33] (single term searches) or systematic terminography (covering of an entire special subject field)?
- Should its methodology have a semasiological or onomasiological approach?

A theory that is to account for all terminology, as Cabré (2003) suggests, should allow prescriptivism as well as descriptivism; must not cut off terminology from society (classic terminology was often seen as a "technical tool"); must give room for language planning (a more linguistically oriented activity); must be able to operate in international multilingual and therefore different cultural situations such as in the EU; and must be able to find solutions for problems such as synonymy and polysemy in relation to standardization and specialised dictionaries in multilingual situations. The final objective of any theory must be to describe real data, and (like every sound theory) offer an applied side from which to solve the problems mentioned above.

Based on these premises, Cabré proposed her *theory of doors*, a model that represents the plural, but not simultaneous access to the object (the terminological unit), whether starting from the concept, the term or the situation (see figure 22 below). Cabré's *theory of doors* is based on two assumptions, first that terminology is simultaneously: “a set of needs, a set of practices to resolve these needs, and a unified field of knowledge” (Cabré 2003: 182). The second assumption was that the elements of terminology must be seen as *terminological units*. These units are multi-dimensional, i.e. at the same time units of knowledge (the concept), units of language (the term) and units of communication. This multi-faceted feature distinguishes them from other units of language with the same structural features

[33] Terminography, also known as applied terminology or terminology work, involves the collection, description, processing and presentation of concepts and terms of a specialized field in the form of specialized bilingual or multilingual resources such as glossaries or term banks.

(words), as well as from other units that also express specialized knowledge (other specialized, morphological and phraseological units).

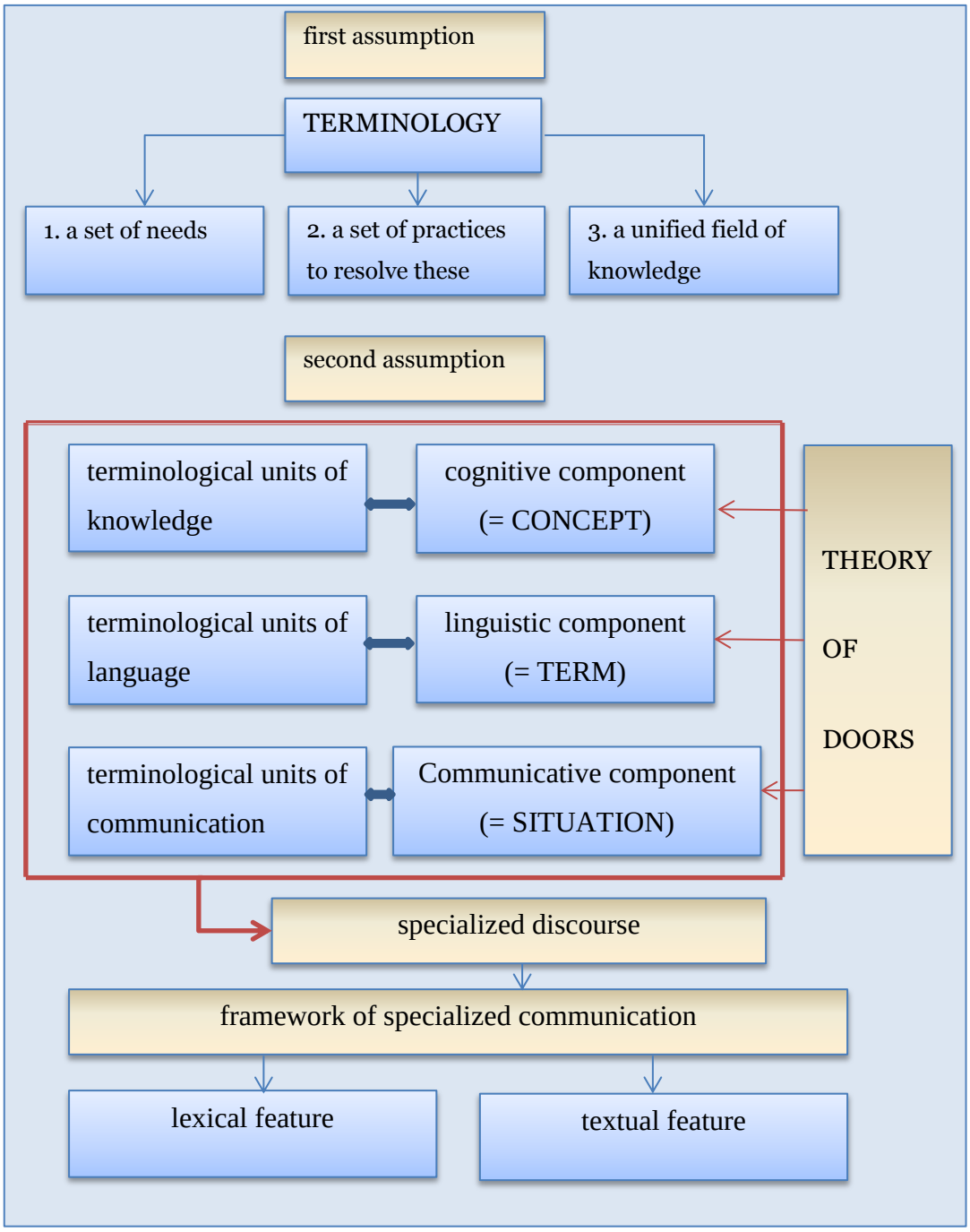


Figure 22: Diagram showing Cabré's idea for a new theory of terminology, called a theory of doors (Sageder, 2010, p. 129; Cabré, 2003, p. 181-187).

The terminological units exist within a framework of specialized communication which transfers specialized knowledge. The information is characterized by its lexical features; its meaning is limited through the special context and by its textual features and is more concise and precise than that of general texts. It serves the information transfer between specialists, between specialists and semi-specialists, and between specialists and learners.

There have been more initiatives to revise the GTT, but Cabré's approach, also referred to as the Communicative Theory of Terminology (Bowker, 2011), seems the most promising, as it favours:

- The study of terms in texts rather than as context-independent units;
- The idea that terms are more likely to represent fuzzy and dynamic categories.
- A more descriptive approach instead of prescriptive standardization;
- The study of synonymy and polysemy.

Terminology's main *raison d' être* is to serve science, technology and communication, that is why it must be directed at the users of LSP. If they are experts or specialists, the emphasis will lie on the concepts and the naming of concepts and terms; if the end-users are not specialists but laypersons, the emphasis will lie on communication; if the end-users are terminologists, the emphasis will lie on the specialist knowledge, on the compilation, description, processing and creation of concepts and terms. The way these term collections or termbases are presented, though, is almost as important as the content itself.

4. The methodology of terminology

From an educational point of view, Korkas and Rogers (2010) address the question *How much terminological theory do we need for practice?* They show how theory can support practice in postgraduate courses or master's programmes in translation which include terminology and/or the use of terminology management tools. They point at potential shortcomings in practical terminology when too much focus is laid on technology-driven, purely instrumental skills which lack a solid theoretical background. They therefore advise a balanced approach that reveals the value of terminology theory in terms of guidelines for good practice.

The same approach is taken by Van der Vliet at the TiNT conference in Antwerp in 2009. His *Practice before the theory: towards a method for terminology management*[34] [translation ES] is addressed at producers and users of Dutch terminology and gives practical advice on reliable, verifiable and workable terminology management, illustrating how the theory of terminology can help to develop a sense of relevance and reason.

4.1 The different approaches via onomasiology and semasiology

Onomasiology is the branch of linguistics that deals with concepts and the terms that represent them. Onomasiology starts from a concept (an idea, an object, etc.) and works towards the term (the designation). The concept has priority over its designation. A thesaurus[35], for instance, is compiled according to onomasiological principles the focus of which is on the characteristics and structuring of content rather than on other levels of linguistic description. Thesaurus systems serve as classified lists of keywords in particular domains. They are used for information storage (knowledge representation) and information retrieval (knowledge

[34] *Praktijk voor de theorie: naar een methode voor terminologiebeheer* (Van der Vliet, 2010).

[35] A thesaurus is a collection of words arranged in lists or groups according to sense (SOED, 2006).

exchange). An onomasiological approach is used in creating terminologies and for compiling mono-, bi-, or multilingual terminological dictionaries.

The opposite of onomasiology is semasiology. This is the branch of linguistics that deals with words and phrases and their meanings. Semasiology starts from the word (the dictionary entry) and works towards the meaning; it means that the word and its form have priority. The semasiological approach in lexicography[36] is used for monolingual or bilingual dictionaries where words are almost always placed in alphabetical order. An alphabetical order helps to quickly find or look up a word, but is of less use when its precise form is unknown. In that case, the search has to start from the opposite side, beginning with the sense or the meaning of the concept in question. Here an onomasiological dictionary (or termbase) will prove its usefulness. By being not only term-oriented (based on the word forms of the terms in alphabetical order), but also concept-oriented (based on characteristics that describe these concepts, a termbase allows users to start their queries from multiple directions and from the general to the more specific. Due to the relationships between concepts, a termbase also enables cross-referencing.

Especially in multilingual dictionaries, an onomasiological approach creates a more accurate result and a better layout. In a semasiological approach, the entry corresponds to a concept which is fixed by a definition in the source language. The target term is at best a suitable translation equivalent of the source term, but not necessarily the linguistic target language designation of the target language concept. In the onomasiological approach, the concept is or should be the same for all languages and the differences are in the designations. An overview of some similarities and differences between onomasiology and semasiology and between

[36] Lexicography is the art or practice of writing dictionaries (SOED, 2006).

lexicography and terminology is given below.

Similarities and Differences between Lexicography and Terminology		
SUBJECT	**LEXICOLOGY**	**TERMINOLOGY**
definition	principles and methods that deal with writing dictionaries	principles and methods that deal with the proper processing and use of terms
field of study	study of words	study of terms
approach	semasiological: word towards meaning	onomasiological: concept towards term
domain	all the words of a language (LGP), mainly for speakers	language of a specific field (LSP), mainly for written texts
users	speakers in a variety of different situations, all kinds of topics, general discourse	experts, specific and professional situations, specialized topics, restricted and formal discourse
meaning	meaning is related to the word and always linked to grammar	the concept is independent from the term that represents it
unit of meaning	words in context	terms of their own account, one concept - one term (in principle)
variation	discourse, inflection, morphological form or syntax	mostly nouns, compounds, phrasal constructions
synchronic or diachronic	synchronic and diachronic (archaisms are allowed)	only synchronic (no "old" terms allowed)
evolution	free evolution without prescriptive intervention	evolution restricted, prescriptive intervention
standardization	NO	YES
definitions	for the word, less explicit, avoids identical definitions unless synonyms	for the concept, exhaustive, states relationships with related concepts, avoids homonyms unless in different concepts, synonyms with status label
ordering system in dictionaries	alphabetic	systematic ordering according to the conceptual structure
bilingual or multilingual dictionaries	dictionary entries or meanings not always identical for all languages	concept is identical for all languages, only designation (term) differs

Figure 23: Overview of similarities and differences between lexicography and terminology.

4.2 The relevance of domain, object, concept and term

Terminology is concerned with material, immaterial or abstract objects for the purpose of communication. The cognitive sciences (e.g. logic and ontology) study the connections between object (referent), concept (idea, thought, knowledge) and term (symbol, word, or expression). In linguistics, the *semantic triangle* illustrates the indirect relationship between object and communication. The semantic

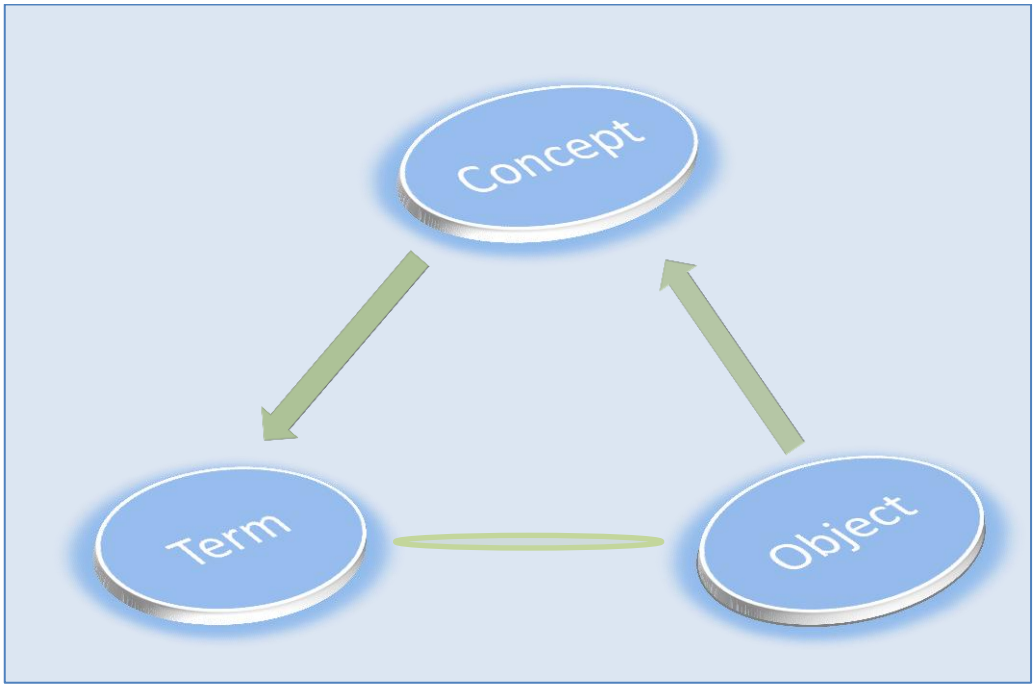


Figure 24: The semantic triangle describes the indirect object-term relationship.

triangle is a model for explaining how words convey meaning. It says that a word suggests an idea or concept in the mind of the hearer. The concept connects to an object in the real world. The concept is designated by a term but is not the term itself: it is the linguistic expression or symbol representing the concept in its particular knowledge domain. A term is used for communication in the LSP connected to that domain. According to the theory of terminology, the concept is universal and has a higher level of abstraction than the term. Concepts describe the common elements, called characteristics, of physical objects, classes of objects, or

more abstract elements of thought such as actions, processes or qualities. The minimum number of characteristics necessary to identify a concept is called its essential characteristics. They may be functional, observable or imaginable features. In logic, a concept can be described in two ways: firstly, by its *intension* or internal content (the sum of characteristics that constitute a concept) and, secondly, by its *extension* or external content (the range of objects the concept refers to). For instance, the intension of *sea-going ship* is *large buoyant watercraft fit for voyages on the open sea*, whereas its extension embraces such things as cargo ships, passenger ships, container ships, tankers, etc. Concepts can be placed in a system of related concepts; these relations are based on their characteristics which may differ to a greater or a lesser extent. Characteristics define the concept and the concept system as accurately and concisely as possible; conversely, the description of a concept or concept system leads to the knowledge domain in which it occurs. Each activity or specialised field can be represented by or conceptualised as a structured system of individual concepts; the entire set constitutes the domain in question.

4.3 Relations between concepts in a concept structure

It will be clear that concepts are not isolated units of thought but always exist in relation to other concepts. Depending on the thought system used to organise concepts in a systematic way (e.g. into classes), the relationships between concepts can be can divided into basically three types. The first type of relationships are logical relationships; these are based on similarity and shared characteristics. If one concept is similar but more general or broader than another, it will lead to a logical subordination with a vertical ordering; similarities can also lead to a logical coordination and a horizontal ordering. Vertical and horizontal ordering are often combined. The second type of relationships are ontological relationships. They are not based on the similarity between concepts, but rather on their proximity to each other in the real world. They may form relationships based on coordination leading

either to a part-whole ordering or to a chain relationship based on a succession in time or in a process which leads to a cause-effect ordering. A third type of relationships for organizing a concept system is a taxonomy. A taxonomy is used for biological classifications that indicate natural hierarchical relationships with "species" as the lowest rank.

According to ISO 704 (2000), at least the following relationships shall be used to model a concept system:

1. Hierarchical relations (these relations can be presented as a tree diagram or an indented list) and consist of:
    1.1. Generic relations in which a superordinate concept is more general than its subordinate, more specific concepts. Generic relations are also known by their Latin term *genus et differentiae*[37] and offer several ways of subdividing a concept into subordinate concepts. Subordinate concepts at the same level that share the same dimension are called coordinate concepts.
    1.2. Partitive (part-whole) relations in which the comprehensive concept is the superordinate concept and the subordinate concept is the partitive concept. Subordinate concepts at the same level that share the same dimension are also called coordinate concepts.
2. Associative relations; these are non-hierarchical relations. An associative relation exists when a thematic connection can be established between concepts, e.g. proximity in space or time. Examples of associative relations are: raw material and product, action and equipment, quantity and unit, material and state, substance and property, action and target, etc.

[37] Literally: a family and its different members; the term for the traditional rules of definition based on Aristotle's analysis.

Figure 25 below shows the approved type of diagram proposed by ISO[38] for depicting generic relationships. In this example the generic relation is given for concepts related to the object *sea-going ship*. The concept definition is taken from the *Encyclopaedia Britannica*. The *sea-going ship* is the general concept and the other, subordinate concepts relate to specific types of ships. A concept in a generic relation is more specific when it has the same characteristics as that of the general concept, plus at least one additional delimiting characteristic. At each lower level, the degree of specificity becomes higher (the concept "narrows down"). The specific concepts in this example are on the same level of hierarchy and have the same criterion of subdivision; they are called coordinate concepts and are interrelated in a horizontal, coordinating relationship.

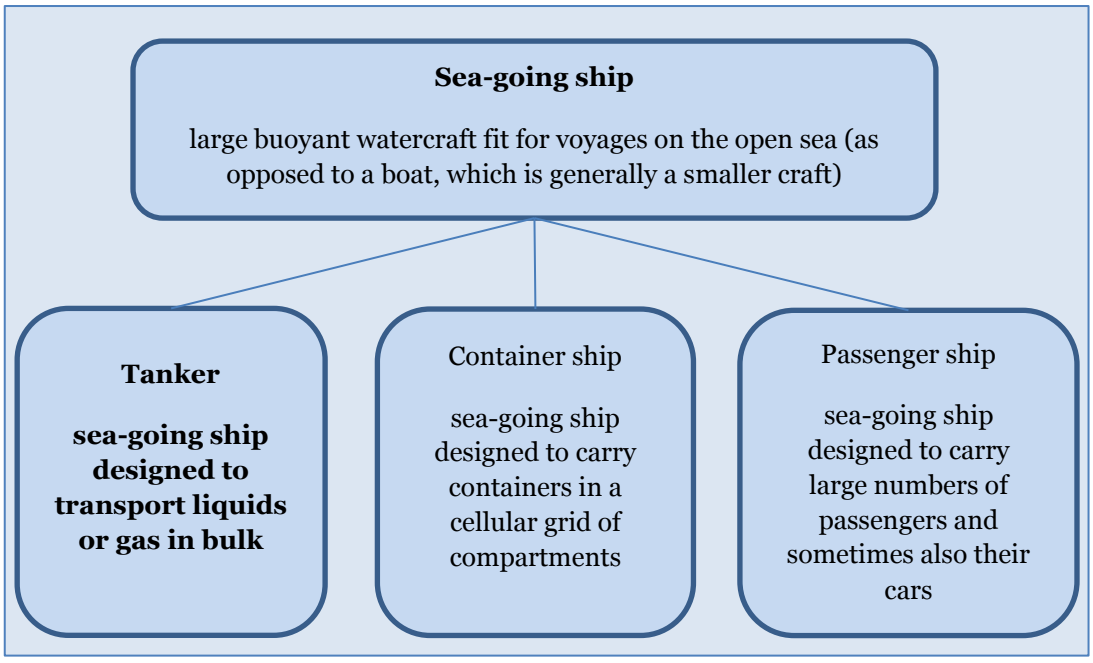


Figure 25: Generic relations between concepts for several types of sea-going ships.

The next diagram depicts a partitive relationship. This is when the superordinate or comprehensive concept represents a whole, while the subordinate or partitive

[38] ISO 704 Terminology work, principles and methods (2000, p. 6).

concepts represent parts of that whole. Subordinate concepts at the same level and sharing the same dimension are called coordinate concepts.

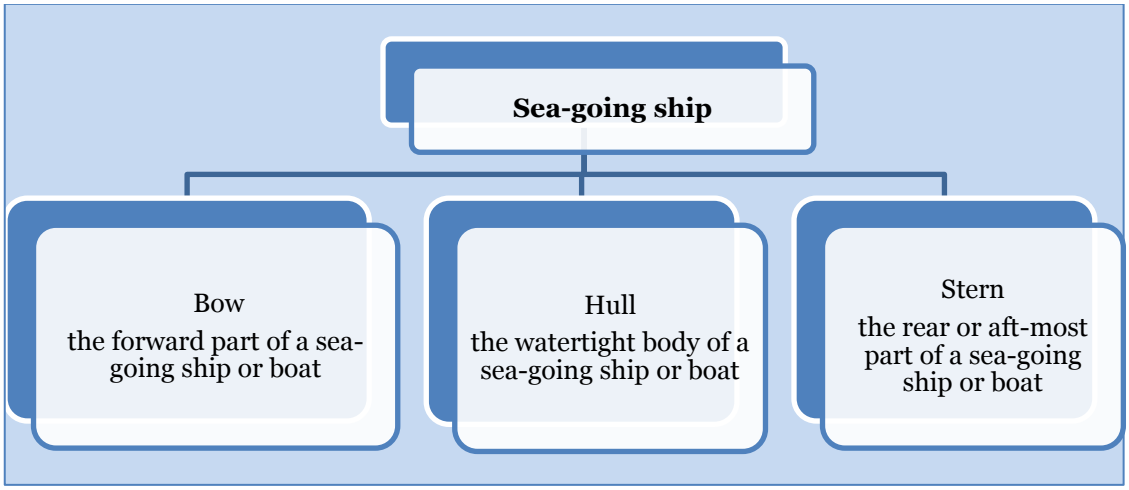


Figure 26: Partitive and coordinating relationships between concepts for sea-going ship, bow, hull and stern.

The diagram below is the ISO 704 graphic for an associative relationship, which is non-hierarchical. In this example the concepts are connected via the relation between a construction and the material of which it is made.

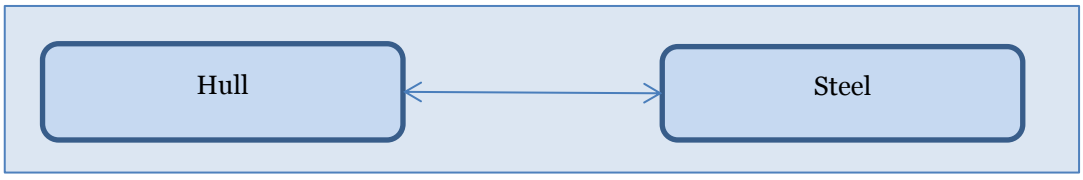


Figure 27: Associative relationship between hull and steel (iron).

In real terminology work, concept descriptions tend to be exhaustive. The ones used in the examples above are as short as possible, but those in the following ones will, for brevity, be even shorter. The emphasis, after all, lies on the illustration of concept relations, not on concept definitions; they are dealt with in thesis chapter 4.4. The

next diagram is an example of several subordinating and coordinating relationships, combined with a partitive relationship (bottom row).

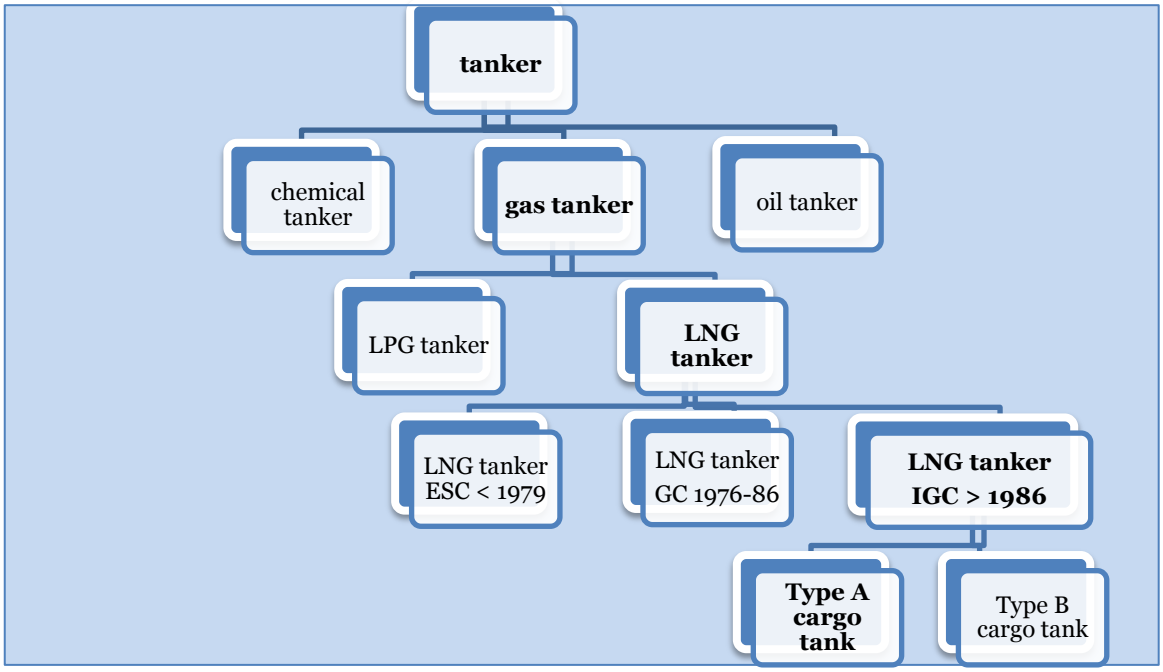


Figure 28: A five-level generic, coordinating and partitive organization of concepts for the relation between tanker and Type A cargo tank of an LNG tanker

In the diagram, the line of relationships can be traced from *tanker* (here the general concept) to *Type A cargo tank*[39] of an LNG tanker[40] (this is a tanker built after 1986 in compliance with the IMO IGC Code[41]). The vertical relationship is from the general term *tanker* via generic relations to more specific types of tankers such as *gas tanker, LNG tanker, LNG tanker IGC > 1986*. The last vertical step is to *Type A cargo tank*. The relationship between *Type A cargo tank* and the superordinate concept *LNG tanker IGC > 1986* is a partitive one. The different types of tankers are interrelated in three levels of horizontal, coordinating relationships.

[39] Type A cargo tanks are independent (insulated) tanks of prismatic form; type B are spherical tanks.

[40] LNG is Liquefied Natural Gas.

[41] International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, issued by the International Maritime Organization.

These examples show how a concept system serves to model the abstract structure of a specialized knowledge domain, field or subfield. The model clarifies the relations between the concepts and forms the basis for a uniform and standardized terminology. The concept structure can be presented as a diagram (above) or as an indented list (below):

Concept system from Tanker to Type A cargo tank

1. Tanker

1.1. Chemical tanker

1.2. Gas tanker

1.2.1. LPG tanker

1.2.2. LNG tanker

1.2.2.1. LNG tanker ESC < 1979

1.2.2.2. LNG tanker GC 1976-1986

1.2.2.3. LNG tanker IGC > 1986

1.2.2.3.1. Type A cargo tank

1.2.2.3.2. Type B cargo tank

1.3. Oil tanker

Figure 29: Concept system of figure 28 in the form of an indented list.

Another example of a concept structure (a very large one) is EuroVoc, the Multilingual Thesaurus of the European Union. EuroVoc is used for processing the documentary information of the EU institutions. The thesaurus serves as a coherent indexing tool for document management and enables users to carry out documentary searches. EuroVoc is split into 21 domains and 127 microthesauri or subsets of the complete concept structure (EuroVoc, 2014).

Below is a fragment of the domains and subdomains used in EuroVoc for maritime shipping:

Domain and thesaurus system used in EuroVoc

44 EMPLOYMENT AND WORKING CONDITIONS

48 TRANSPORT

4806 transport policy

4811 organisation of transport

4816 land transport

4821 maritime and inland waterway transport

NT1 maritime shipping

RT freedom of navigation [1231]

RT navigational code [4806]

RT ship's passport [4806]

RT traffic signs [4806]

4826 air and space transport

52 ENVIRONMENT

68 INDUSTRY

72 GEOGRAPHY

Figure 30: Domains (capital letters) and thesaurus system used in EuroVoc of the EU.

Concept systems not only serve as models of the knowledge domain in bilingual or multilingual situations, but also facilitate the comparative analysis of concepts and designations across languages and the writing of definitions.

When terminologists start organizing concepts into a concept system, they should also consider the expectations and objectives of the prospective users of the terminology product (glossary, dictionary, specialised vocabulary, etc.). The process of organising a concept structure may also involve consulting experts of the domain in question.

4.4 The use of definition, context and pictures in terminology

A concept is described in three ways: firstly, via its definition; secondly, via its relationship to other concepts in the concept structure with reference to the subject field; and thirdly, by its designation, the concept's "official" linguistic form as a term. The term as a unit of language allows for communication in LSP.

The terminological definition is the most important application of the single-concept principle, because it describes the concept in its domain. The quality of the terminological product (glossary, terminological dictionary, etc.) is largely determined by the quality of the definitions. A concept definition is based on the sum of its characteristics. Terminological theory, in principle, only recognizes definitions based on the *genus et differentiae* principle, using a concept's *intension* (content) and/or *extension* (range). The intensional definition starts from the next superordinate class to which the concept belongs and to which are added characteristics that distinguish it from the superordinate concept and also separate it from its coordinate concepts. By first stating the generic concept, the characteristics that make up the intension of that generic concept are implicitly assumed in the definition. This also creates the necessary links for the concept structure.

In the example below, the definition *ladder* from the next higher concept is used in the definitions of *accommodation ladder* and *pilot ladder*.

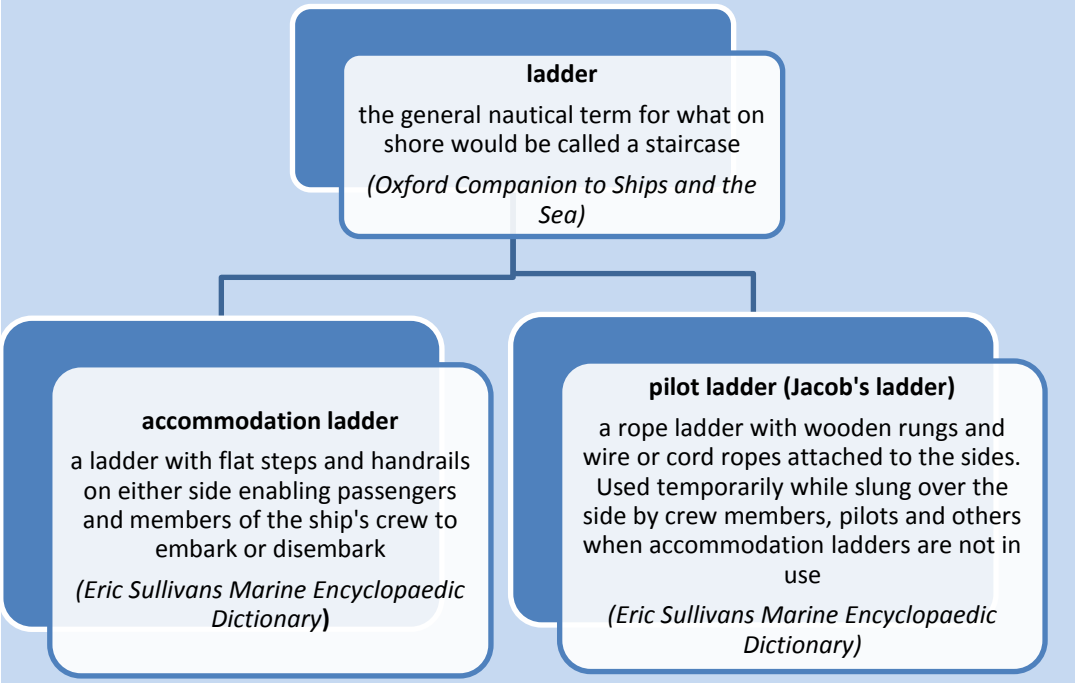


Figure 31: Example of a generic-differentiae type definition.

A *genus et differentiae* definition can also be based on a concept's *extension*, a list of subordinate, lower concepts or parts. This type of definition may be used in combination with the *intensional* definition or as an alternative in cases when the intensional definition poses too many difficulties. Examples of extensional definitions are given in figure 32 where all definitions use lists such as *a vessel is a ship, brig, sloop or other craft used, or capable of being used, to navigate on water*. Legal definitions, especially, tend to be exhaustive.

Additional types of definitions may be used that allow for more flexibility than the formal taxonomy-style definitions mentioned above. They are only permitted if they lead to accurate descriptions of the concepts in question. These additional types of definitions include:

- Definitions using near-synonyms or paraphrase[42];
- Definitions based on function or operation;
- Definitions based on implication or explication;
- Definitions based on demonstration (drawings, pictures, diagrams).

A definition may also be realised by using a mix of all the above mentioned types.

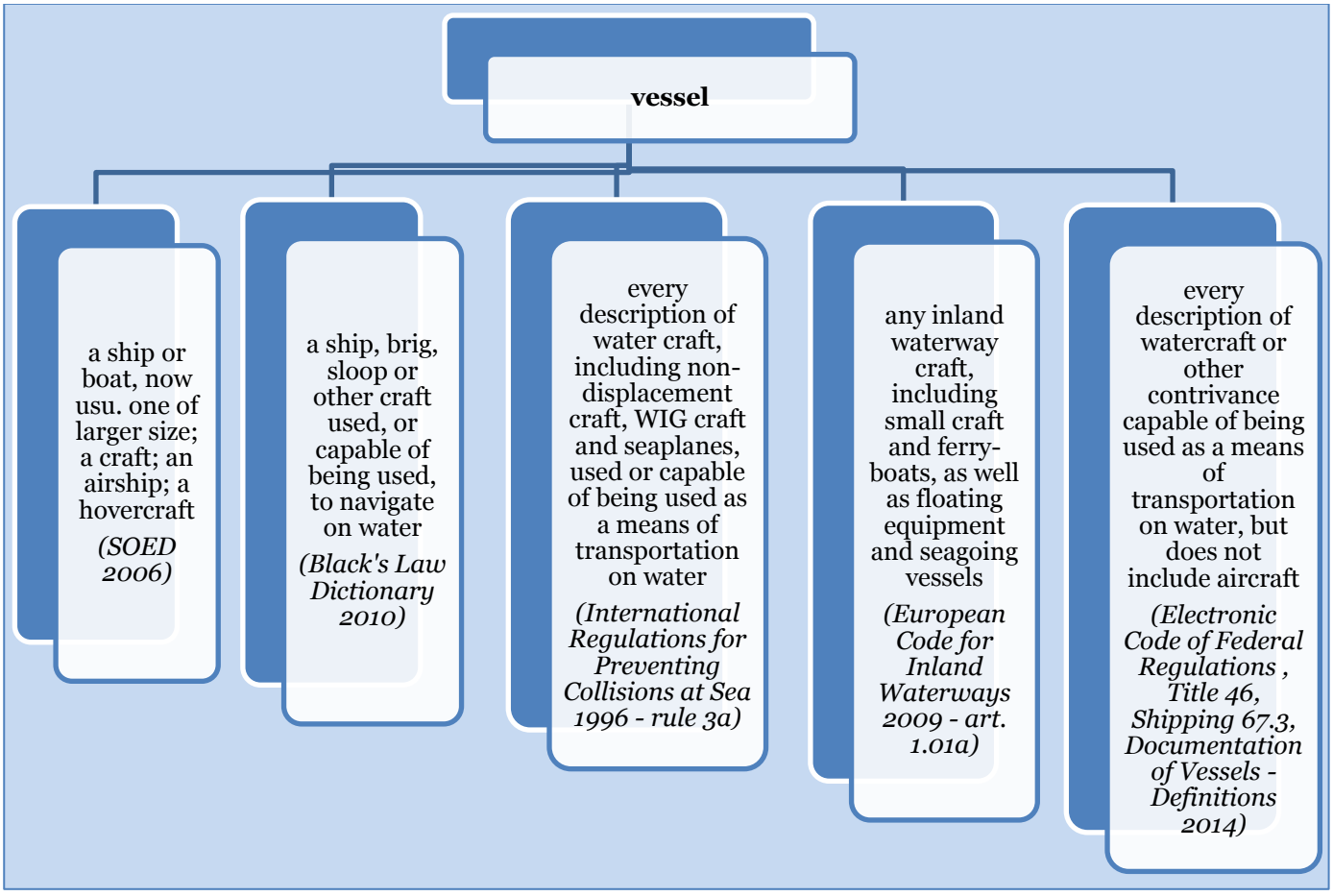


Figure 32: Extensional definitions of the concept *vessel* used in dictionaries and international laws/regulations.

Definitions are often made with the help of a defining vocabulary the meaning of which is taken as axiomatic, i.e. not requiring further explanation. Where definitions from reliable sources are available these should be used rather than the creation of new definitions (COTSOES, 2003, p. 28). It is important to let self-made definitions

[42] Atkins & Rundell (2008) do not advise using synonyms, see thesis p. 55.

be checked by experts. It is also advised to use a type of definition that best suits the profile and the communication needs of the target users. In most cases, experts or semi-experts will be familiar with abstract *genus et differentiae* definitions but other users, however, may prefer less abstract ones. Other requirements for definitions are:

- They should be simple, clear and concise and preferably not longer than one sentence.
- They should be comprehensive, neither too broad nor too narrow.
- They should be stated in the affirmative since a negative form is often confusing.
- They should avoid circularity, i.e. not use words whose definitions refer back to the concept or term description.

Alternative ways of concept definitions are description, context and illustration. If there is not enough information available to compose a concept definition, e.g. for *WIG craft*, a term mentioned in the *International Regulations for Preventing Collisions at Sea* (figure 32 above) a provisional description may be offered as in the example below.

WIG craft:
Wing in Ground Effect crafts (WIG) are an emerging technology that provide transportation over water, with characteristics in between aircrafts and marine crafts.

WigCraft Blue Dolphin website

Figure 33: Towards a concept for WIG craft via description (WigCraft, 2012).

It is advised to use as much additional context information as possible to help narrow down any characteristics or functions of the object.

WIG craft:
The Wing-In-Ground Effect (WIG) Craft which flies over the sea surface in a very high speed (…) for commercial and military use since the top secret project KM became known to the western world as the Caspian Sea Monster.

Analysis of Two Configurations for a Commercial WIG Craft based on CFD

Figure 34: Towards a concept for WIG craft via context (Wing-In-Ground Effect, 2009).

Illustrations can be helpful to arrive at a more adequate concept description, although it is maybe more accurate to say, "a better interpretation of the object."

Figure 35: Towards a concept for WIG (Wing-In-Ground Effect) craft via illustrations.

The role of pictures in terminology management was addressed on the 7th EST Congress[43] in Germany in 2013 by its discussion panel "Panel 17". In relation to Translation Studies and Terminology, it found that in terminology research new theoretical and methodological descriptions of concepts and terms are leading to new developments in terminology management. Some of the questions posed were: "Pictures in terminology: are they more useful than definitions? Where do they come from and what do they really show? How can they be translated?" (Jüngst & Vaerenbergh, 2014). These are interesting issues for further research.

[43] EST: *European Society for Translation Studies*; the Congress was held in Germersheim, Germany from 29 August - 1 September 2013.

In SDL MultiTerm 2011, a desktop terminology management system, illustrations and symbols can be included in the database as additional concept information. As there is no adequate English equivalent of the Dutch term *loodsjol*, the Loodswezen termbase uses an illustration of the object. This type of information may prevent the use of friendly but false (i.e. confusing) translations solutions.

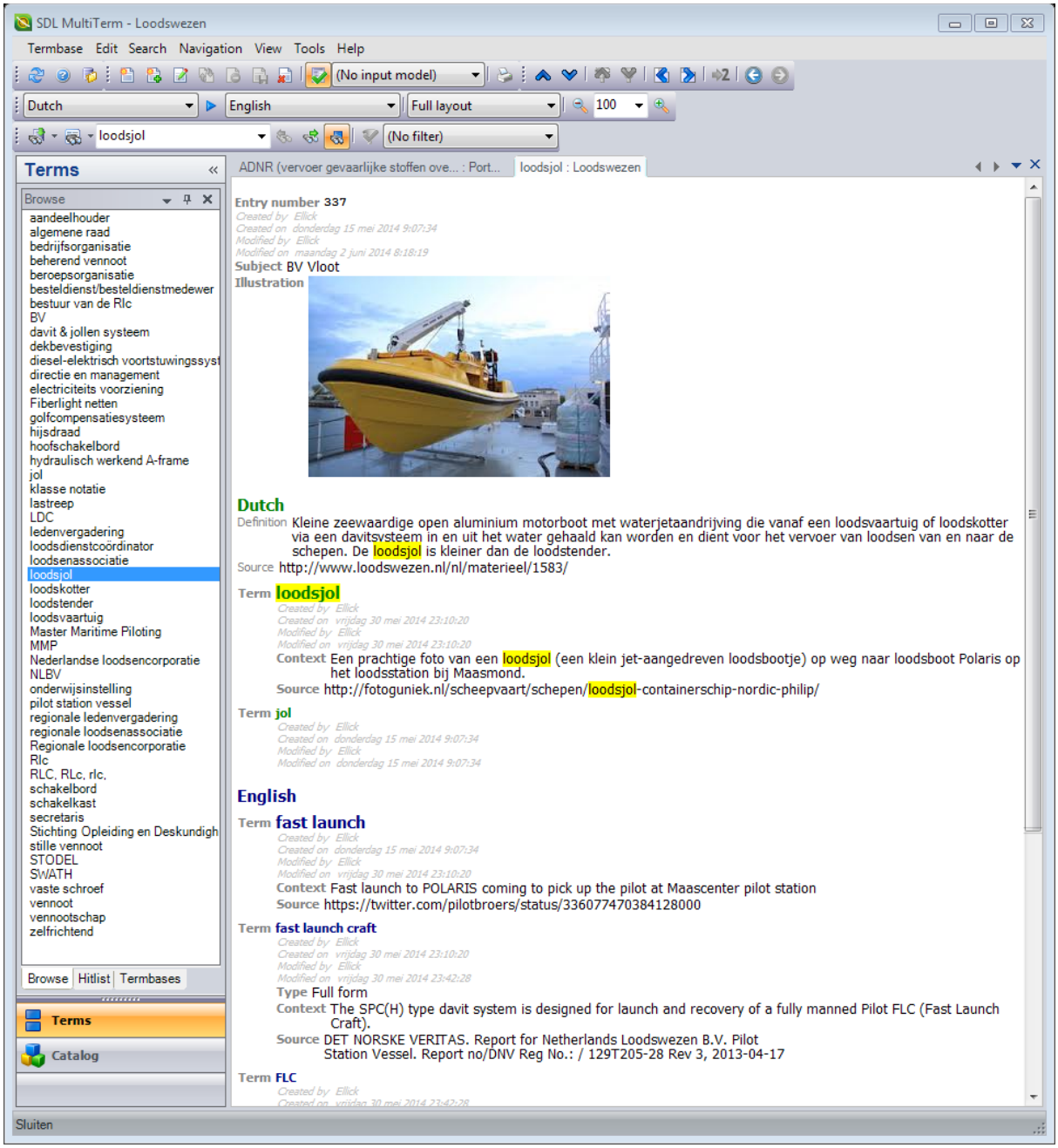


Figure 36: Illustration for *loodsjol* included in the terminology database MultiTerm 2011

4.5 How terminology deals with synonymy and homonymy

Modern terminological theory accepts synonymy and variants of terms and rejects the narrowly prescriptive attitude of one concept - one term (Sager, 1990, p. 58). With regard to synonyms, technical standards and government regulations may use slightly different definitions (as for *vessel* in figure 32) than those generally used in the corresponding subject field. It is advised to include official definitions alongside other definitions but always with a clear indication to which restricted field (or official regulation) they belong. In terminology, the proper use of domain, concept structure and concept are vitally important especially when handling synonyms or homonyms. The definitions in figure 32 include the use of the full synonyms *vessel* and *ship*. Atkins & Rundell have a fundamental objection to defining by synonymy, because "no two words are exactly alike, [it] is only really acceptable when ... [they]... are semantically identical" (2008, p. 421). COTSOES (2003) [44] recommends putting synonyms in the same field in the term record, so the user can compare the various terms for a specific concept. Cabré (1999, p. 38) suggests "When several different designations exist for a single concept, either one is chosen and all the others are discarded, or more than one is accepted, but one form is given priority over the others." A priority status must be indicated in separate fields in the termbase. Synonyms which do not designate identical concepts are called near-synonyms and have to be entered into a separate record. Homonyms are less problematic than synonyms. Homonyms have the same written form but are of different meaning and origin and will be placed in different domains and entries. The word *vessel* in the maritime domain (*ship*) is a homonym of the vessels in human anatomy (*blood vessel*) and plant anatomy (*trachea*). In lexicography homonymy is gradually being abandoned as an organizing principle: access to an item is through its orthographic form, homonymy is ignored (Atkins & Rundell, 2008).

[44] COTSOES is Conference of Translation Services of European States.

4.6 Terminology management systems

Terminology management is the term used for a systematic treatment of terminology and includes terminology work and the use of a terminology management system (TMS). A TMS is a flexible computer tool that can be customized to the demands of a particular terminology project.

A TMS should comply with a number of requirements. It should be user-friendly and transparent; it should have a reliable way of keeping terminology collections up-to-date; its databases should be flexible and easy to create, easy to consult, easy to manage, and easy to correct and/or amend. The system must be able to work as a stand-alone unit but also enable information sharing with other TMS units and CAT tools. Interoperability between the various tools and databases therefore has become an important item. ISO has actively promoted standards for data interchange and the industry has developed formats such as XML (eXtensive Markup Language), TMX (Translation Memory eXchange), TBX (Term Base eXchange) and XLIFF (Localisation Interchange File Format) to facilitate the sharing of data between different software applications (Quah, 2006, pp. 119-1128). Data sharing between MultiTerm and other systems is not always possible due to differing formats.

A TMS usually consists of an interface and a termbase. Information is stored in a termbase according to a pre-arranged structure defined by its creator. MultiTerm uses three hierarchical levels of information. The first level is the Entry level which applies to all languages; the second level is the Index level and applies to one language only; the third level is the Term level and refers to specific terms in one language. MultiTerm has a Termbase Wizard to help create new termbases. The main task in the wizard is the specification of a termbase definition, i.e. the structures or fields to which entries should conform. The fields can be managed by

the termbank creator according to the purpose of the termbank. A typical termbase entry may consist of the information given in figure 37.

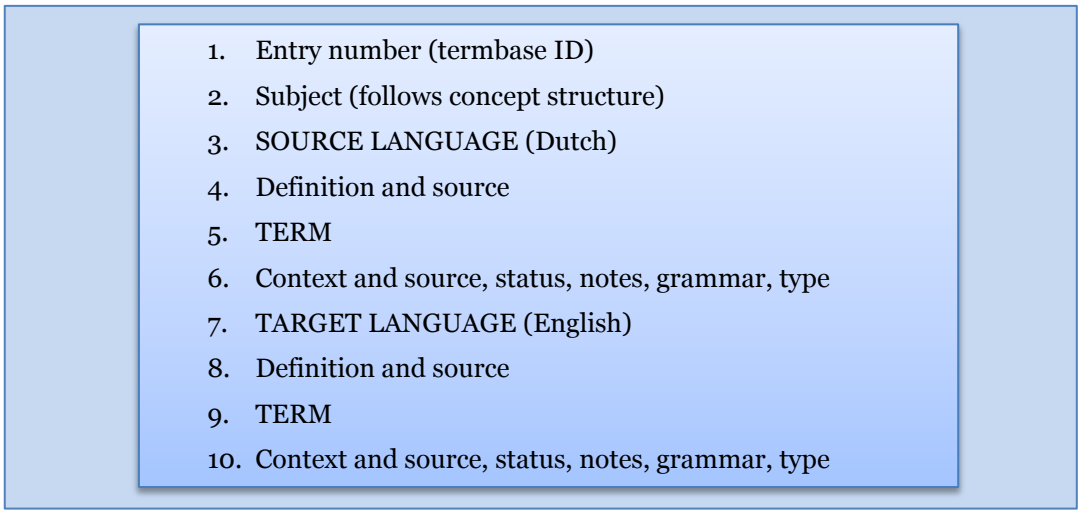


Figure 37: MultiTerm 2011 termbase wizard has assigned fields for the Loodswezen termbase

The LISA[45] Terminology Management Survey, carried out among terminology users in the localisation industry, found that the most important types of terminological information recorded were definition and context including their source data (LISA, 2005).

The date of creation may be included; it may be an item by which others can assess the reliability of a record. Below is an example of extra information (context, note, source and status) that can be stored in MultiTerm (here the PEC 2014 termbase, open on the entry *hinderlijke waterbeweging*).

[45] LISA is Localization Industry Standards Association.

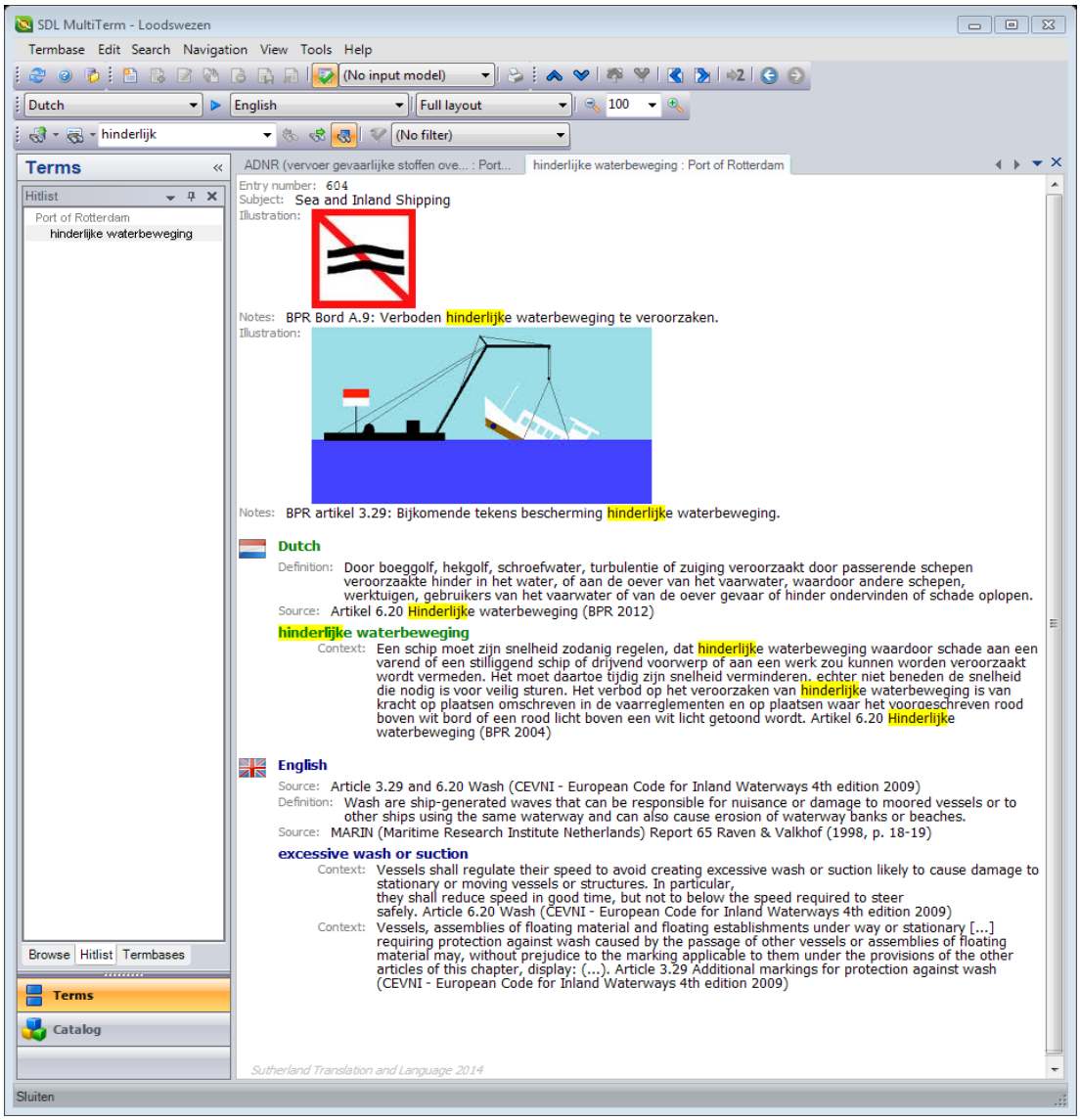


Figure 38: An example of additional information added to the term *hinderlijke waterbeweging* in the PEC 2014 termbase of SDL Multi Term 2011.

4.7 The use of terminologies and glossaries

The best and most reliable sources of information on the terminology of specific domains are official terminology banks. Official terminology organisations, such as NedTerm[46], IATE[47] and many others, produce lists of reliable term collections and glossaries. Terminological information can also be obtained from professional

[46] The Dutch Language Union's centre for terminology.

[47] IATE: the EU's multilingual termbase.

organizations, experts, and specialist literature; a specialized corpus, if available, would be ideal for term research. General dictionaries are not reliable as a terminology source because they seldom contain any jargon and when they do the results are unreliable. By definition, paper dictionaries, also specialist ones, do not contain the latest information and although specialist alphabetical or thematic dictionaries are reliable they could be out-of-date. The information in many unofficial terminological references, often in the form of glossaries or bilingual lists, is not verifiable and should be used with caution. Electronic glossaries in that respect have the best potential as they will probably be up-to-date; the only disadvantage is that their information cannot be verified.

4.8 The use of term extraction

Bowker & Pearson (2002) describe how a corpus can be used for building glossaries. Term extraction tools can be used to sift out terms from LSP texts. There are monolingual tools and bilingual tools that work with aligned bilingual LSP corpora. Extraction tools identify single-word term candidates on the basis of frequency of occurrence. The idea is that if a term is important in the domain it will appear often in the corpus. Multi-word term candidates are identified on the basis of linguistic patterns such as noun-noun or adjective-noun combinations, or on the basis on statistical patterns of series of lexical items. Machine-processed extractions, however, are not faultless and will contain general language words not needed in a term list while actual terms may be overlooked by the programme. Extraction results will always need verifying by terminologists.

4.7 Research and methods for terminology

The *Pavel Terminology Tutorial*, written by the Government of Canada's Translation Bureau and available on its website presents the basic principles of terminology research (Pavel Tutorial, 2011). The tutorial builds on the Handbook of

Terminology written by Pavel & Nolet in 2001. The Dutch Language Union and NedTerm have published a Dutch translation on the Canadian website. With regard to terminology work, Cabré (1999) distinguishes between monolingual and multilingual terminology research. She also distinguishes between systematic research, covering an entire domain or subdomain, and ad-hoc research, which is usually restricted to a single term. The important advantage of the systematic approach is that it involves conceptual structuring of the domain or subdomain by which "gaps" in terminology will be avoided; the disadvantage of this method is that it is very time-consuming. Ad-hoc terminology research is normal practice for translators and is usually carried out to solve specific or isolated terminology problems. For terminology work Bowker & Pearson prefer a descriptive, text-based approach. NedTerm advises on a practical and descriptive approach in five steps and points out that an ad hoc method carried out in a structured way for a specific domain can also be called a systematic research. The five steps are the following (NedTerm terminologiecursus, 2014):

1. First the ST and SL term have to be analysed, then the SL term definition must be determined.
2. The next step is to find a candidate term in the TL. If this search has no outcome, creation of a new TL term may be an option.
3. The TL term must be verified using descriptions available in the TL.
4. Descriptions of the SL term must be compared with descriptions of the TL term for equivalence; there may also be synonyms.
5. The relation of the TL term with other terms or linguistic elements must be checked.

5A. The termbase of Havenbedrijf Rotterdam

The Port of Rotterdam Authority is responsible for the port and the industrial complex as well as for the handling of shipping and the offshore approaches. The concept structure of the organization used in the termbase is based on the sitemap of the Port of Rotterdam's website given below.

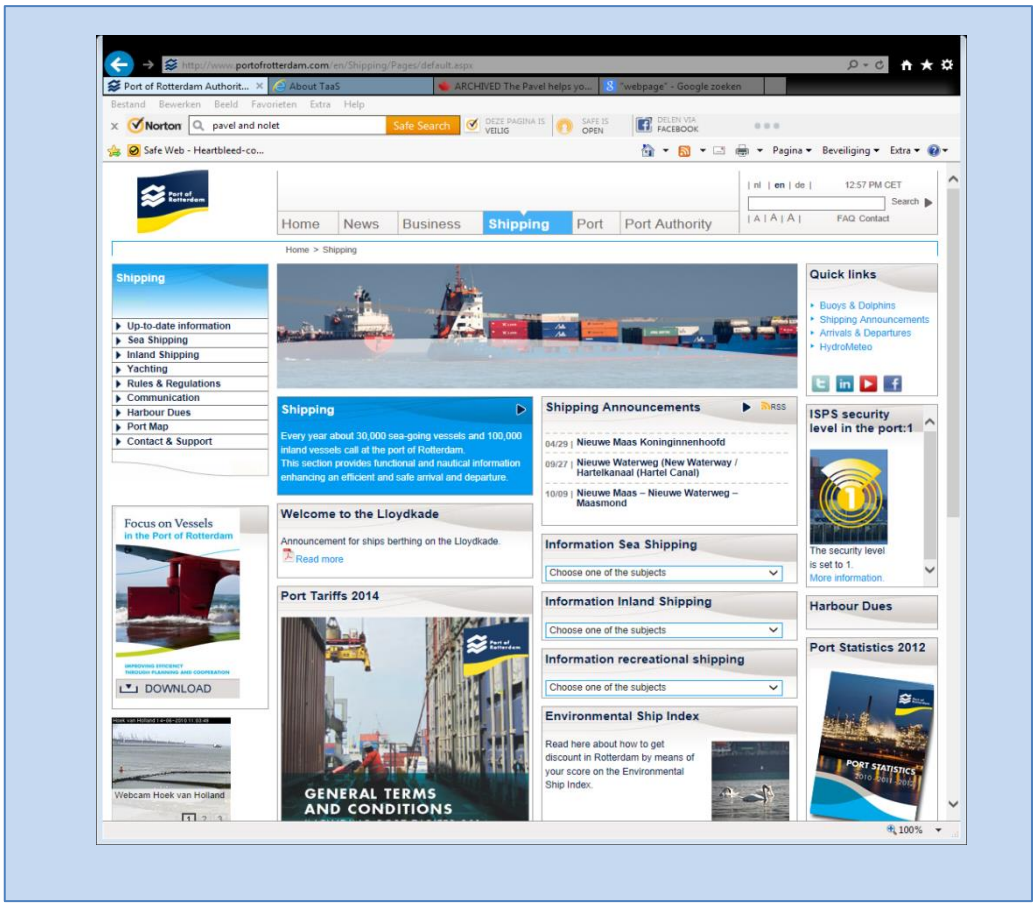


Figure 40: The page *Shipping* (blue header) next to the headers of the other main pages of the Port of Rotterdam's website (Port of Rotterdam - Shipping, 2014).

Since the site map is very detailed, only part of it is copied in the concept structure (see figure 41 below). Concepts and terms from the glossary are placed in the appropriate subject and definition fields, annotations are placed in fields for notes, context, status, and source.

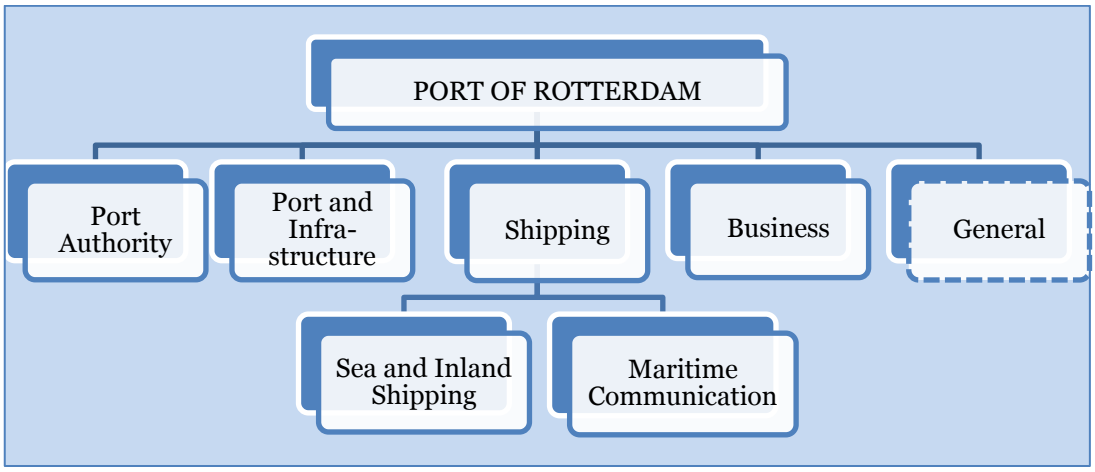


Figure 41: Concept structure for Port of Rotterdam's maritime termbase.

With the aim of standardization, the Corporate Communications department of the Port of Rotterdam has created a bilingual maritime glossary in Excel containing 601 terms in various forms. The glossary is located on the organization's intranet, but the exact location is hard to find. Consequently, employees will often use or invent their own terms. This is a big disadvantage of the present system. The user group consists of experts and lay people from various departments in the organization. To enable standardization, terminological information must be clear and easy to understand and terms must be presented in context to show how they are used.

Analysis of the glossary shows that all the terms belong to the maritime domain. About 30% have notes on pragmatic use, cross-references and source information. The benefit of a TMS is that these kinds of extra information can be presented in a much more organized way, using separate fields for definition, context, notes, type and status. A proper TMS layout adds to user-friendliness and enables information to be presented accurately and, where necessary, with the help of illustrations. Further analysis of the glossary shows that some terms are outdated, e.g. several Dutch Ministries or governmental organizations no longer exist or have taken on different names. Other terms are imprecise, unnecessarily stated in plural or written

with a capital. This illustrates a second benefit of a TMS, namely that it records the dates of term creation or modification and this can alert users that entries may contain old and possibly incorrect data. A third benefit of a TMS is that the source information is presented with the term and can be used to check the entry.

	term category	**%**	**Dutch term (glossary)**	**English term and notes (glossary)**	**MultiTerm Appendix A**
1	normal terms	39	olievervuiling	oil pollution	A 1 (p. 71)
2	plural forms	32	aansluitingen koelcontainers	reefer points (eventueel ook reeferconnections of reefer plug). reefer stack - het stukje van de terminal waar ze staan reefer rack - als er veel op een klein oppervlakte moeten staan, worden ze gestapeld in een soort rek/stellage waar ook monteurs over kunnen lopen	A 2-5 (pp. 72-75)
3	synonyms	8	duwboot	pushing barge, pusher	A 6 (p. 76)
			duweenheden	push-units, push-barges, push-lighters	A 7 (p. 77)
			duwschepen	barge, pusher tug	A 6 (p. 76)
			vaargeul	fairway, navigation channel	A 8 (p. 78)
4	proper names	5	Inspectie Verkeer en Waterstaat	Transport and Water Management Inspectorate Netherlands	A 9-10 (pp. 79-80)
			Kanaaltunnel	Channel Tunnel	A 11 (p. 81)
			Ministerie van Verkeer & Waterstaat	Ministry of Transport, Public Works and Water Management (V&W)	A 12-13 (pp. 82-83)
			Raad Voor De Transportveiligheid	Dutch Transport Safety Board	A 14-15 (pp. 84-85)
5	abbreviations	5	ADN (vervoer gevaarlijke stoffen met de binnenvaart)	ADN (agreement concerning carriage of dangerous goods by inland waterways)	A 16 (p. 86)
			ECT	ECT	A 17 (p. 87)
			kmr (kilometerraai)	kilometer marker	A 18 (p. 88)
6	multi-word terms	5	bedieningstijden bruggen en sluizen	operating hours for bridges and locks	A 19 (p. 89)
			bedienpost Rozenburgse Sluis	the Rozenburgse Sluis's control room	A 20 (p. 90)
7	geographical names	3	Eurogeul	Eurogeul	A 21 (p. 91)
			Spotterstrand	Spotting beach	A 22 (p. 92)
8	terms with a capital	1	Walpersen	Shore pumping	A 23 (p. 93)
9	English terms	2	automatically guided vehicles (agvis)	automatically guided vehicles	A 24 (p. 94)
			flatracks	flatracks	A 25 (p. 95)

Figure 39: Term categories and examples from the bilingual Excel glossary of the Port of Rotterdam.

A final analysis of the glossary shows that the terms can be divided into approximately nine categories of which some exemplary cases have been given in figure 39 above. Nearly 40% of the glossary's terms are "normal" terms, i.e. they are written as singular forms in lower case; another 30% are unnecessarily written as plural forms; the remainder consists of multi-word terms, proper names, geographical names, abbreviations and synonyms. Especially for these last three groups, a TMS offers better ways of presenting information.

In figure 39 above the twenty-five glossary terms are entered into a TMS, here MultiTerm 2011. These terms serve as examples for the way terminological entries from written texts can be organized record. The last Port of Rotterdam termbase entry (A26 on p. 96), namely *aanpassen van ebbe*, serves as an example of spoken maritime language in the Port of Rotterdam.

Terms from the bilingual Excel glossary may be entered one by one in the MultiTerm or the memoQ termbase, but this will take quite some time. There is a faster way in which the complete glossary can be imported into the termbase in one go. To do that, the glossary's Excel format must be converted into a termbase-readable file type. For simple MultiTerm termbases this can be done via the Glossary Converter. For more complicated termbases Multi Term Convert must be used which can handle multiple languages, entry levels, index levels, term levels and descriptive fields. After the data have been imported into the termbase, they can be assigned to their subject fields and then each entry has to be updated and the necessary fields have to be filled in. Examples are given in Appendix A1 - A26.

5A.a. Business Translation Services and the Rotterdam termbase

Business Translation Services (BTS), one of the first translation services in the Netherlands to be awarded double certification (ISO 9001[48] and NEN-EN 15038[49]), has worked for the Port of Rotterdam for years. It provides, among other things, translations of texts for the English website, mailings, leaflets and the annual report. BTS uses the bilingual maritime glossary of the Port of Rotterdam in its original Excel format, but has also imported the glossary into its memoQ CAT tool; the glossary then serves as an additional electronic word list. Although BTS periodically consults the Corporate Communications department of the Port of Rotterdam about the status of the maritime terms in the glossary, it does not carry out systematic terminology management. Due to the fact that the glossary and/or the memoQ word list are not always available for its freelance translators, standardization cannot always be sufficiently guaranteed. BTS recognizes that the use of a TMS connected to its CAT tool, for instance the memoQ terminology tool, would greatly help term standardization, an issue that has become increasingly important for BTS. BTS especially admires the possibility of incorporating pictures and other additional data, such as source and context information, and the use of a term status indicator.

[48] ISO 9001 is the international standard for quality management systems.
[49] NEN-EN 15038 is a European quality standard for translation services and aims to improve the transparency of the translation process.

5B. The termbase of Nederlands Loodswezen

The Dutch maritime pilots are responsible for the pilotage of ships to and from the Dutch ports and co-responsible for those to the Flemish ports on the River Scheldt[50]. They are members of the Nederlandse Loodsencorporatie, their professional organization, and shareholders of Nederlands Loodswezen B.V., the private limited liability company that provides facilities services to the pilots. The main activity of Nederlands Loodswezen B.V. is the transportation of pilots to and from the ships.

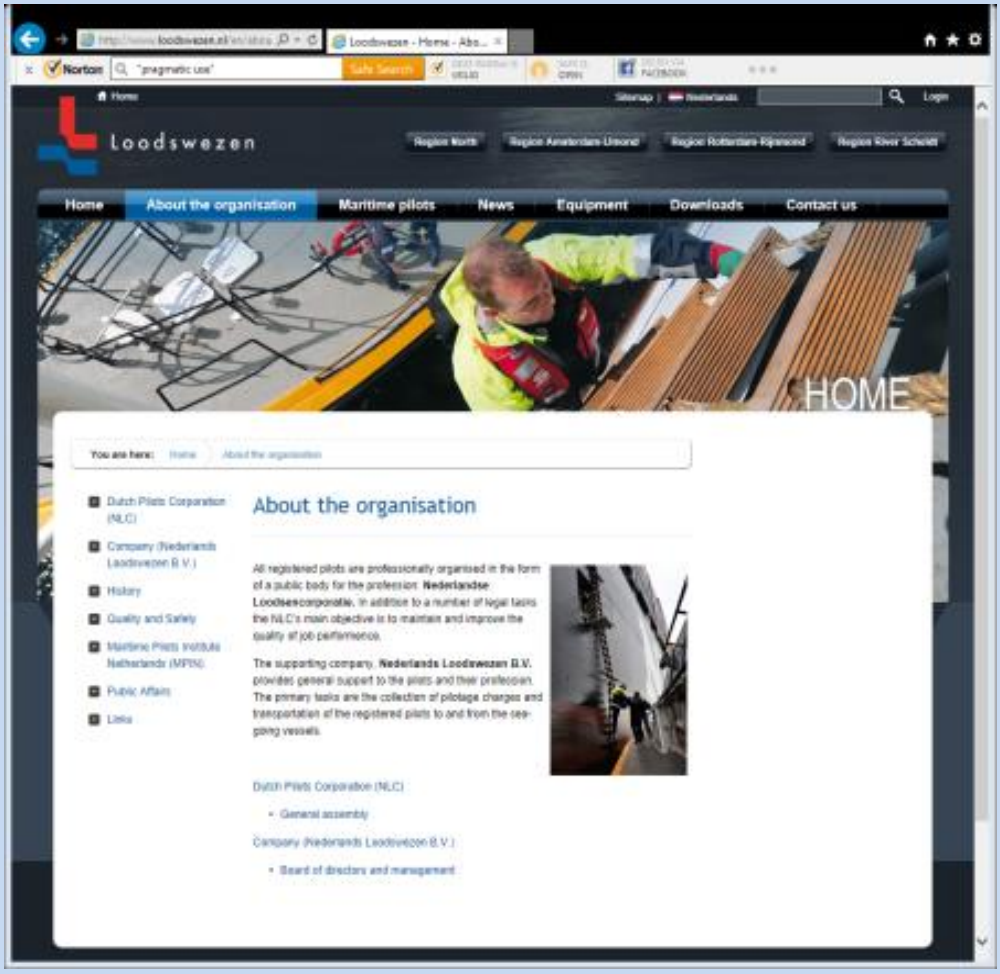


Figure 42: The page *About the organisation* of the Loodswezen website (Loodswezen, 2014)**.**

[50] According to the Treaty between the Kingdom of Belgium, the Flemish Region and the Kingdom of the Netherlands (Scheldt Regulations) signed in 1995.

In the past decade, a number of ad hoc translations, carried out by a succession of at least eight translators, have created the English pages of the Loodswezen website. A bilingual glossary has not been created and, as a consequence, terms have not been standardized. The website is now being modernized and with new content being written, standardization has become an important issue. In addition, Loodswezen wishes to have its "problematic" terms, for which no reliable equivalent is yet available, documented, translated and managed. Users of the Dutch Loodswezen website are its Dutch customers (shipping companies, shipping agencies), the ports, nautical colleges, local, national and European politicians, the press, people working with Loodswezen, Dutch, European and international maritime pilots, and the maritime world in general. The English website will be completed at a later stage; it will mainly be directed at the organization's foreign customers.

Existing terms have to be standardized and managed. New and existing terms and their concepts have to be researched and a concept structure has to be created .

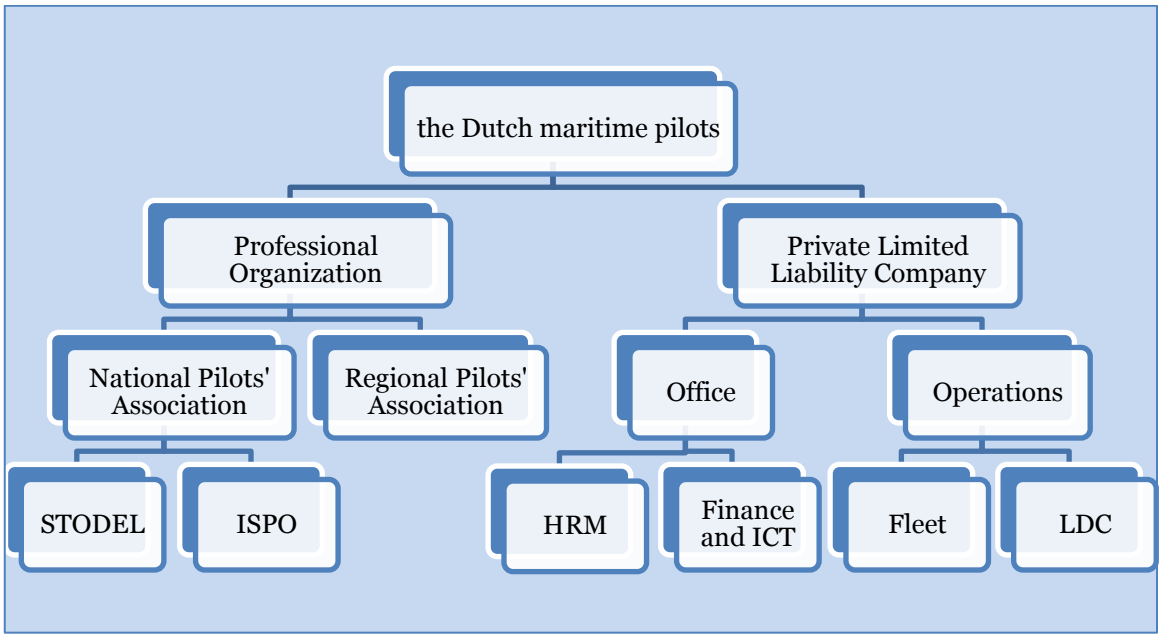


Figure 43: Concept structure for Loodswezen's maritime termbase (Loodswezen, 2014).

The concept structure has to be assigned to a termbase and, finally, the terms have to be loaded.

The concept structure for Loodswezen is based on its organizational structure. Concepts, terms and translation equivalents required by Loodswezen are entered into the termbase according to pre-designed fields for subjects, definitions, notes, context, and source information. Examples are given in Appendix B1 - B8.

Conclusion

Maritime English consist of a collection of related Languages for Special Purpose (LSP). The part of Maritime English known as Standard Marine Communication Phrases (SMCP) is a Controlled Language. Linguistic measures, aimed at creating uniform, unambiguous communication, have led to specific syntactic features such as a concise, precise and sometimes simplified syntax and grammar and a formal and impersonal style. There is a preference for the use of nouns and nominal groups, but their semantic and pragmatic features often differ from those in general language. Although Maritime English is the dominant language, these aspects also apply to Dutch maritime language. To describe maritime LSP more accurately, two things are needed: first, more corpus-based (descriptive) research into their linguistic features; and second, more research into spoken maritime LSP, especially where SMCP is mixed with non-standard or non-controlled variants.

Terminological theory can be of assistance in setting up a Terminology Management System for maritime organizations. The aims are reliability, precision, standardization and user-friendliness. The case study uses ideas from the classical theory with regard to concept structure, precise concept/term definitions, source information and standardization, but it follows modern terminological theory with its acceptance of synonymy and polysemy. Synonyms are listed under the same entry and serve to illustrate slightly different perspectives of a concept; this can add to a more nuanced communication. The case study uses modern theory in a practical, descriptive approach of terminology in which the term context and the possibility of added non-linguistic information in the form of pictures is very important. If, apart from the aspects mentioned above, the TMS and its database are easy accessible, easy to create and easy to operate and, in addition, has a standardized database exchange format, it will certainly be a better tool than a bilingual glossary.

Recommendation:

With regard to text-based maritime terminology used by the Port of Rotterdam, Business Translation Services and Nederlands Loodswezen, the emphasis of terminology management must lie on standardization rather than on description. The use of standardized or preferred terms has to be promoted by their corporate communications departments and managements. Standardization will be greatly helped by an accessible, user-friendly TMS enabling in-company users, authors and translators to consult up-to-date specialist maritime terminology presented within a context and, where possible, assisted by visual information.

To arrive at a consistent corporate terminology, Port of Rotterdam, Business Translation Services and Nederlands Loodswezen are advised to set up a well-structured TMS and to assign a person, for example a terminologist, who will be responsible for terminology work, terminology management and maintenance of the system; the organizations are also advised to create a consultative structure or guideline via which users, terminologist, corporate communications department and management can propose, advise and decide on the organization's terminology.

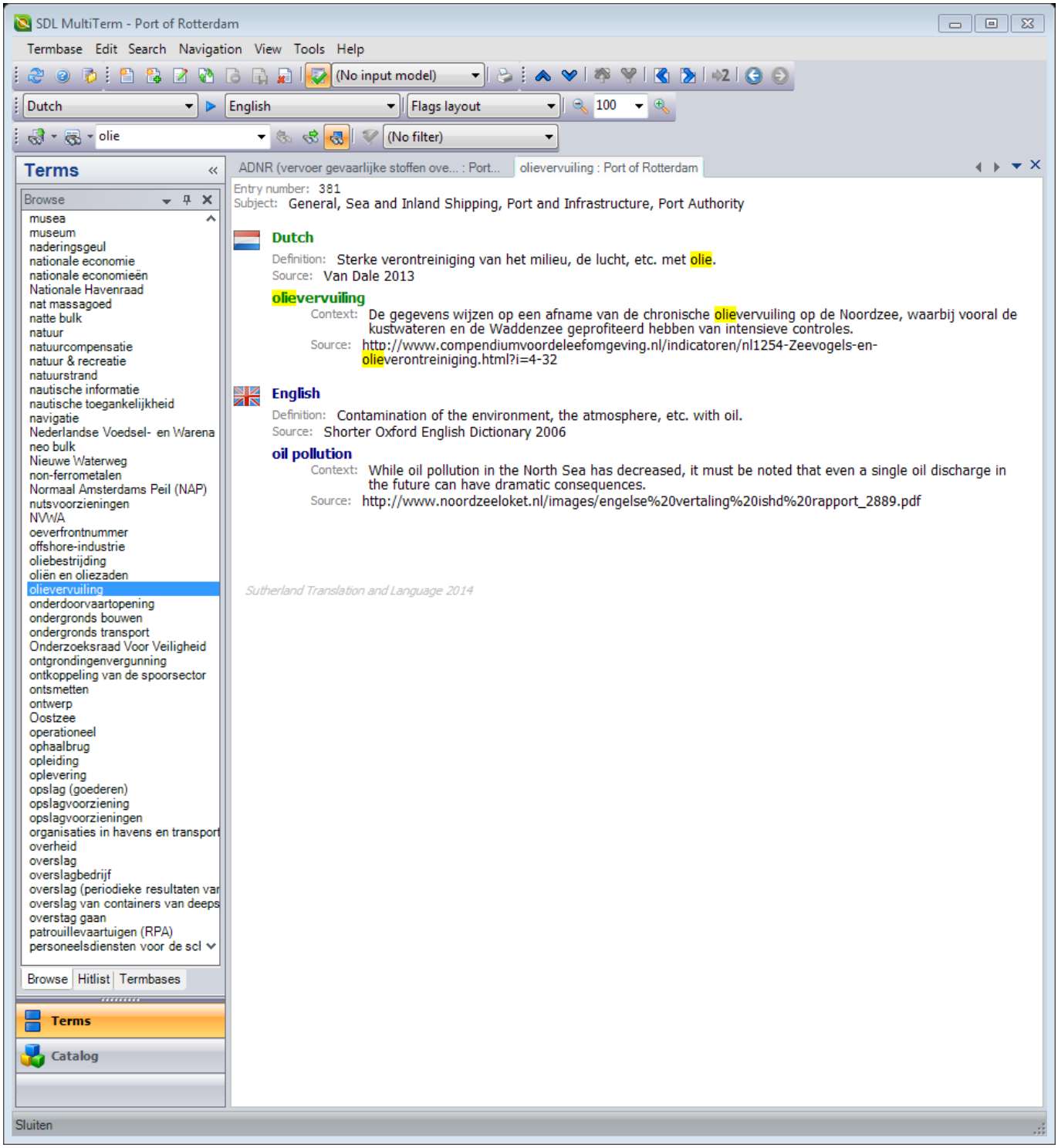
Appendices: examples of terminological entries in a TMS

There are two appendices. Appendix A presents 26 examples in the form of printouts of terminological entries from the Havenbedrijf Rotterdam termbase into which terms from the glossary are imported, improved, updated and completed with more precise information and/or pictures. Appendix B consists of 8 examples from the Nederlands Loodswezen termbase with terms from its website texts, completed with more precise information and/or pictures. These examples illustrate how a TMS (here MultiTerm 2011) can be used to store Dutch-English maritime terminology using working principles from the theory of terminology.

Appendix A

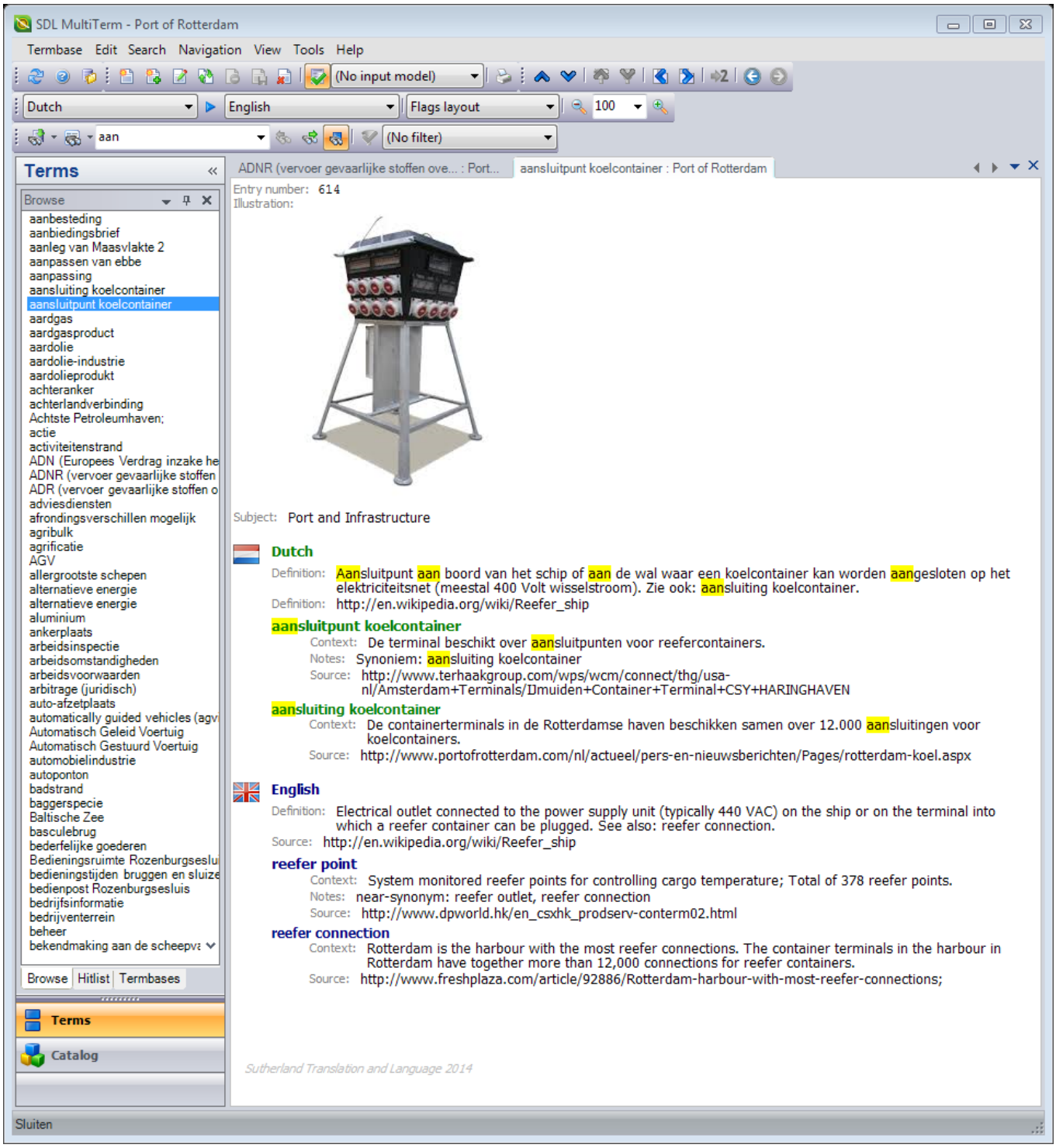
(1)

Printscreen of *olievervuiling.* Port of Rotterdam termbase; entry number 381; subject General, Sea and Inland Shipping, Port and Infrastructure, Port Authority.



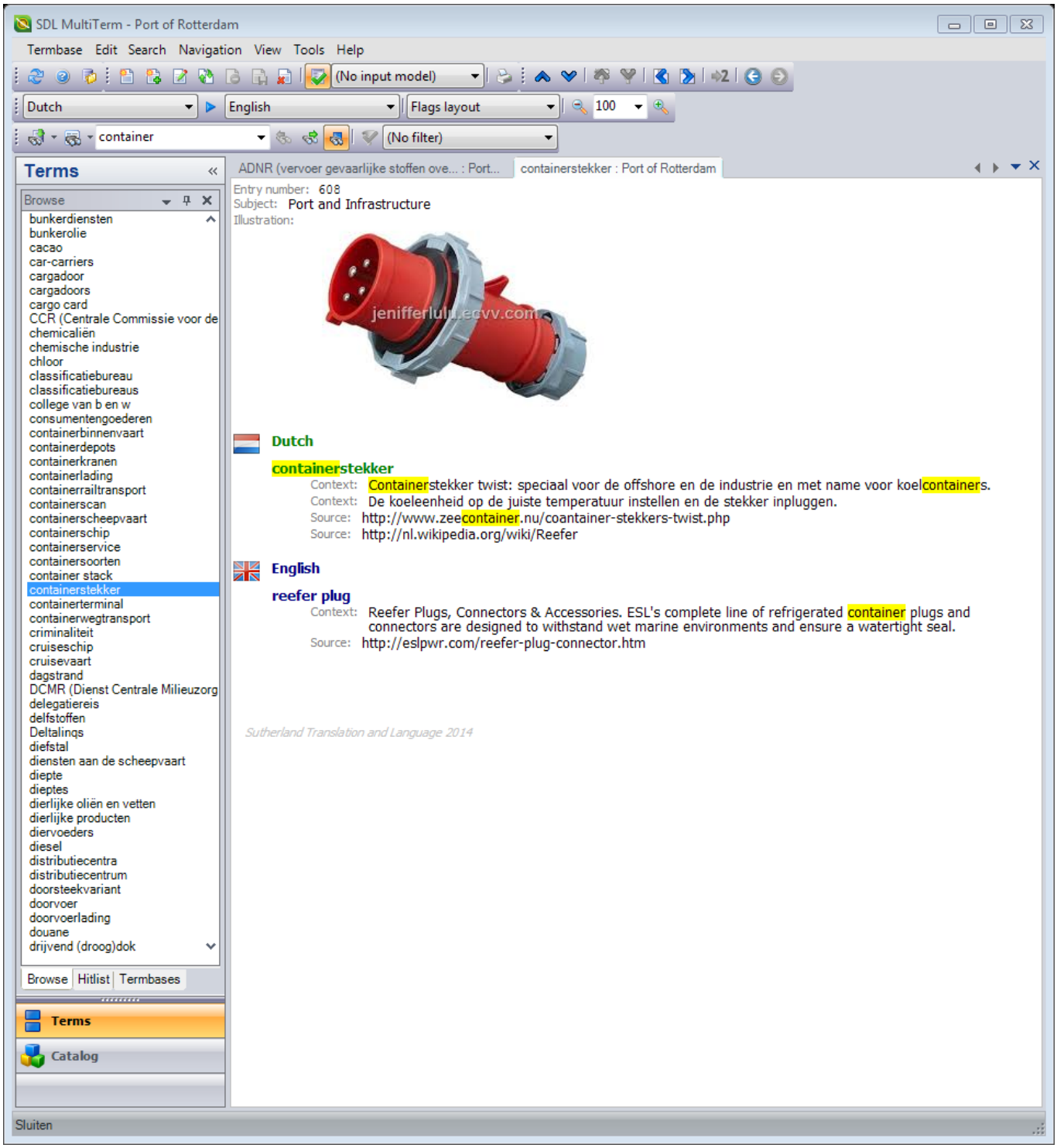
Appendix A (2)

Printscreen of *aansluiting koelcontainer.* Port of Rotterdam termbase; entry number 614; subject Port and Infrastructure.



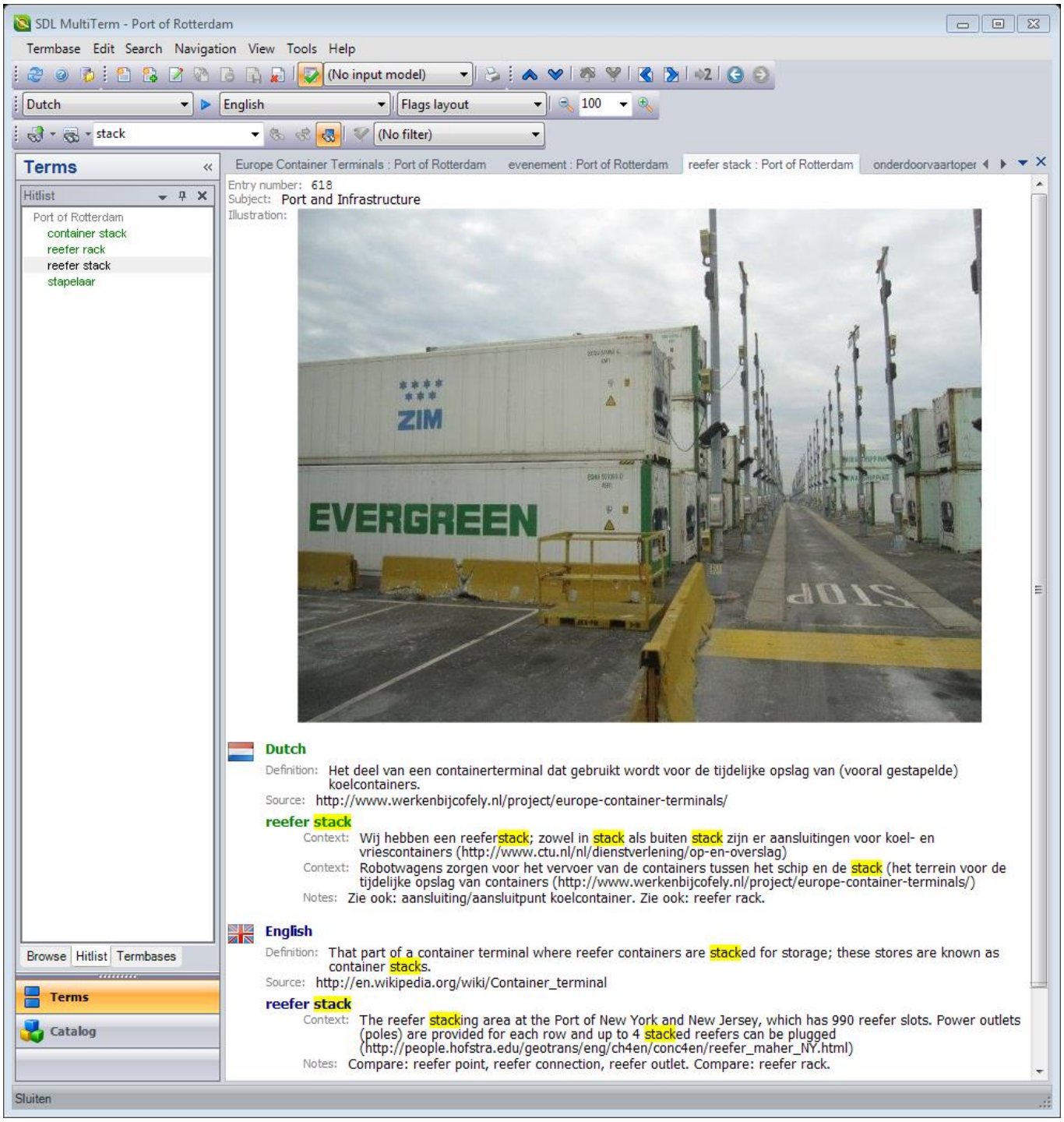
Appendix A (3)

Printscreen of *reefer plug.* Port of Rotterdam termbase; entry number 608; subject Port and Infrastructure.



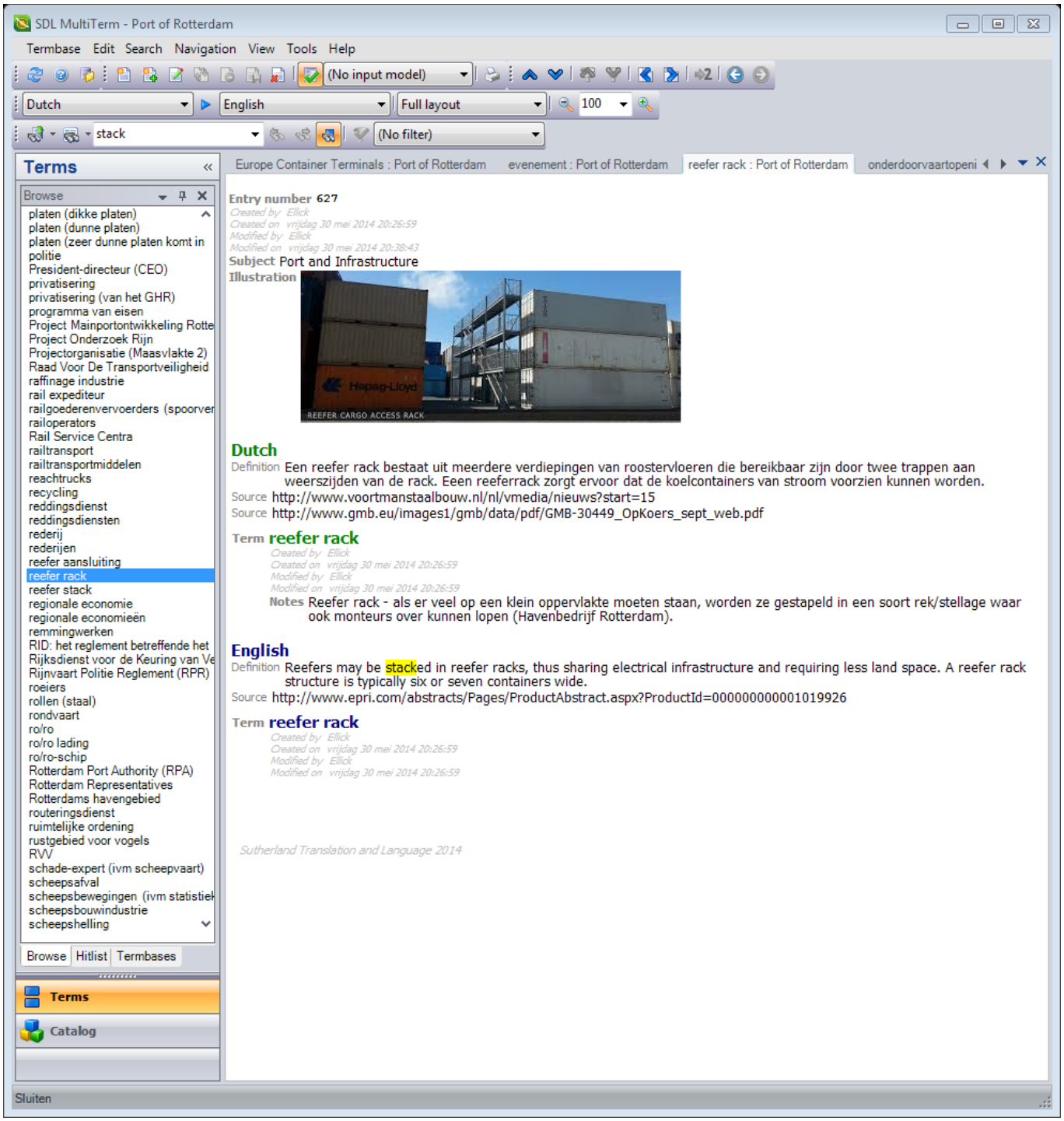
Appendix A (4)

Printscreen of *reefer stack.* Port of Rotterdam termbase; entry number 618; subject Port and Infrastructure.



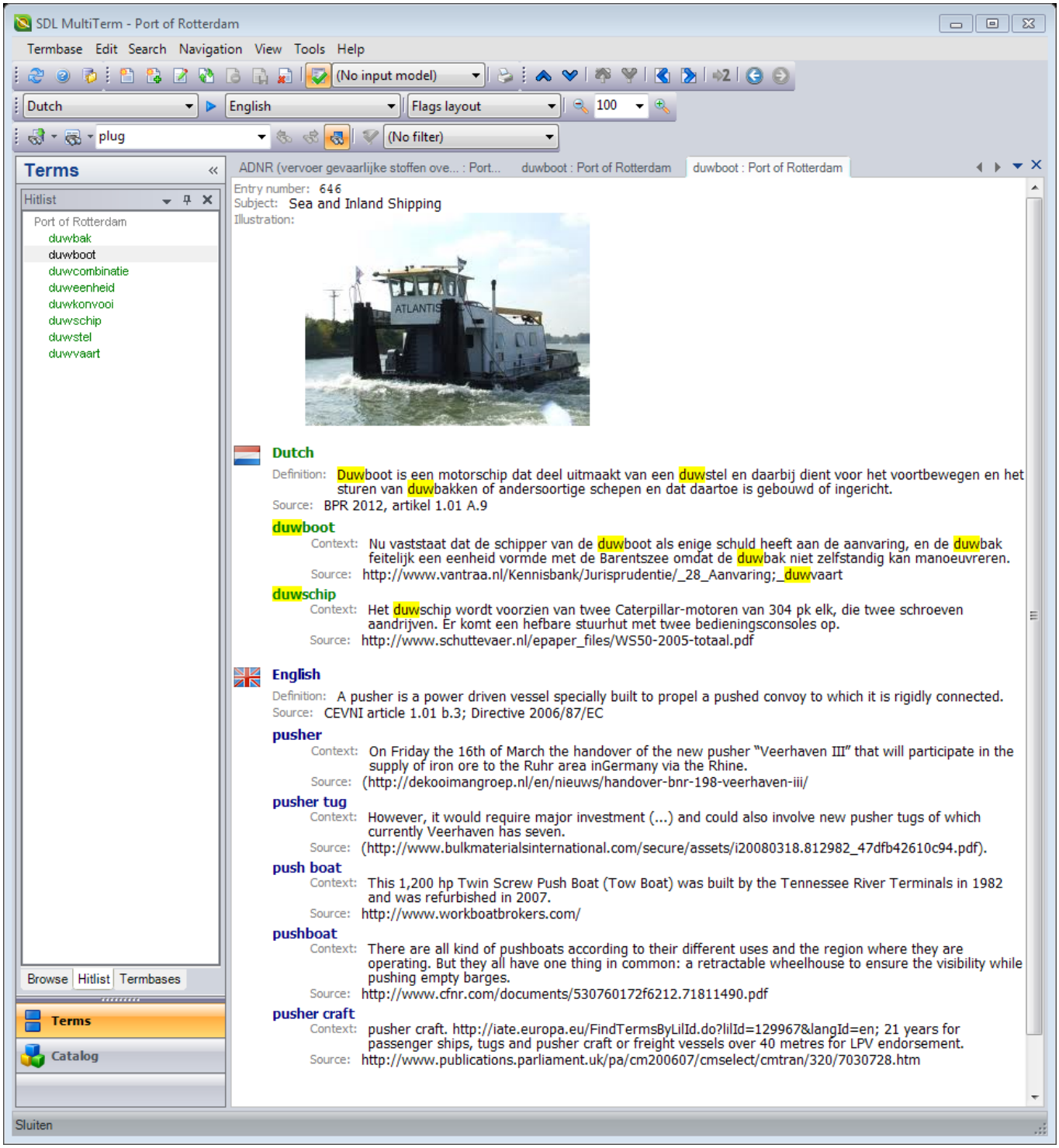
Appendix A (5)

Printscreen of *reefer rack.* Port of Rotterdam termbase; entry number 627; subject Port and Infrastructure.



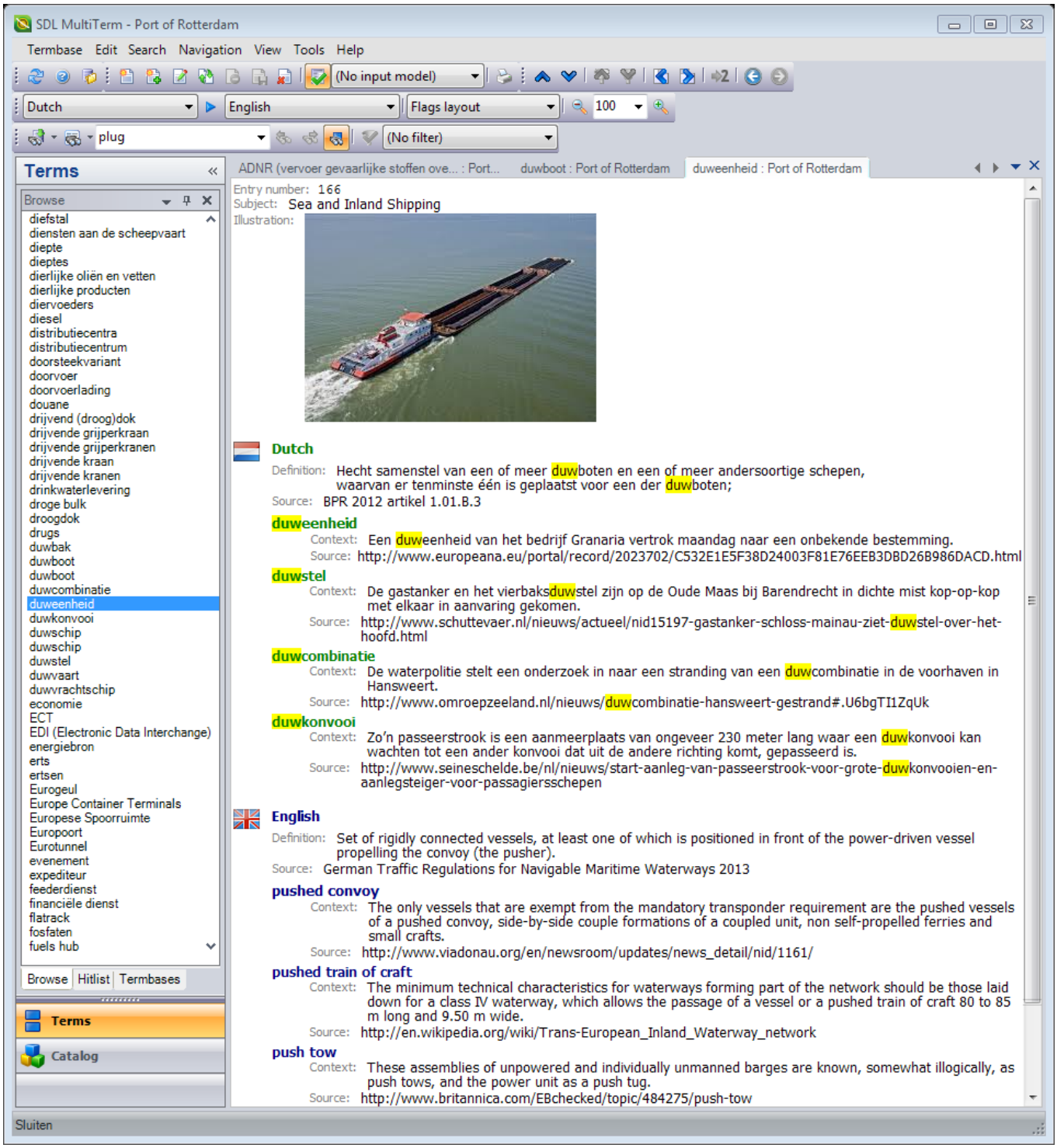
Appendix A (6)

Printscreen of *duwboot/duwschip.* Port of Rotterdam termbase; entry number 165; subject Sea and Inland Shipping.



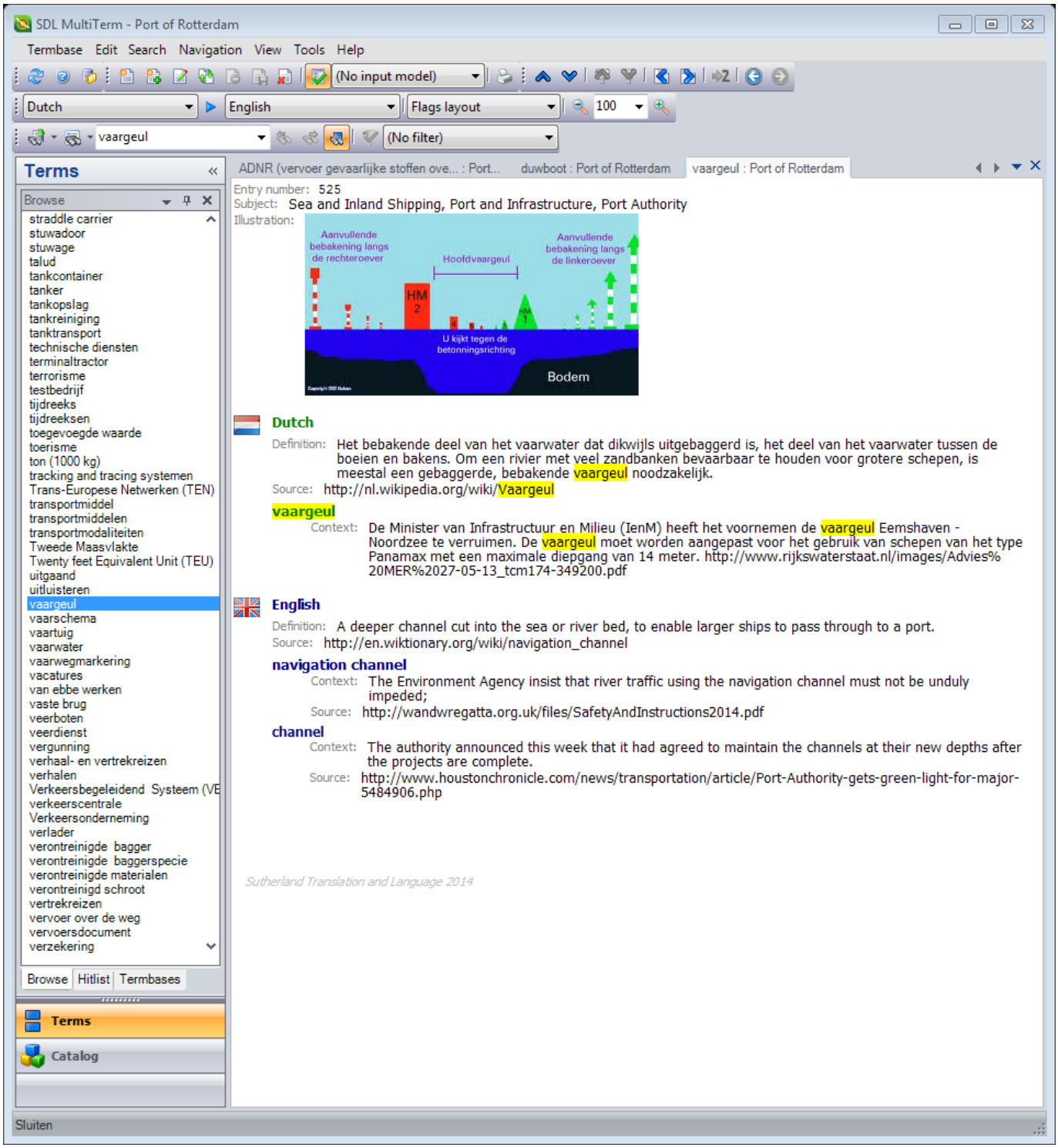
Appendix A (7)

Printscreen of *duweenheid.* Port of Rotterdam termbase; entry number 166; subject Sea and Inland Shipping.



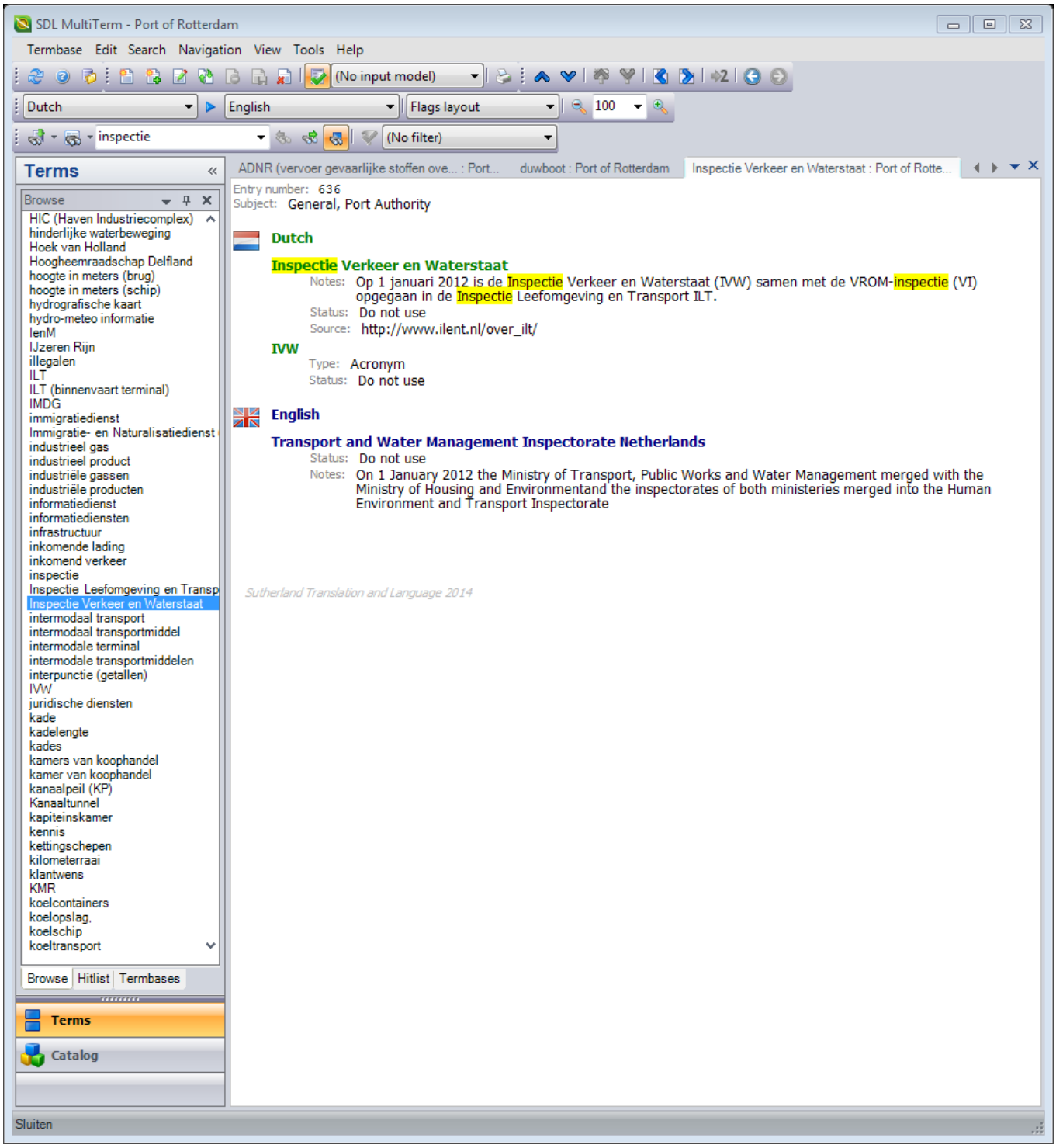
Appendix A (8)

Printscreen of *vaargeul.* Port of Rotterdam termbase; entry number 525; subject Sea and Inland Shipping, Port and Infrastructure, Port Authority.



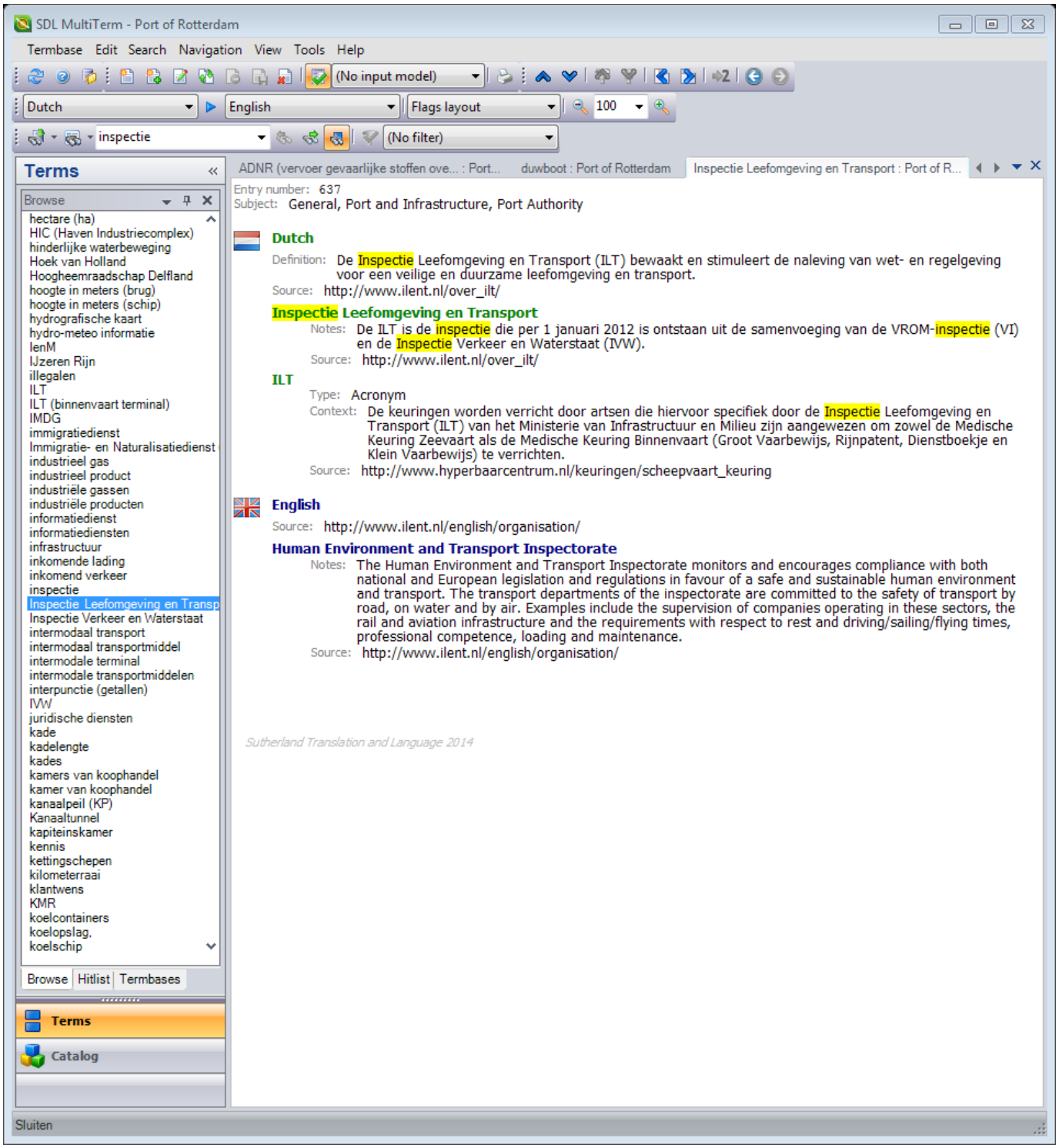
Appendix A (9)

Printscreen of *Inspectie Verkeer en Waterstaat*. Port of Rotterdam termbase; entry number 636; subject General, Port Authority.



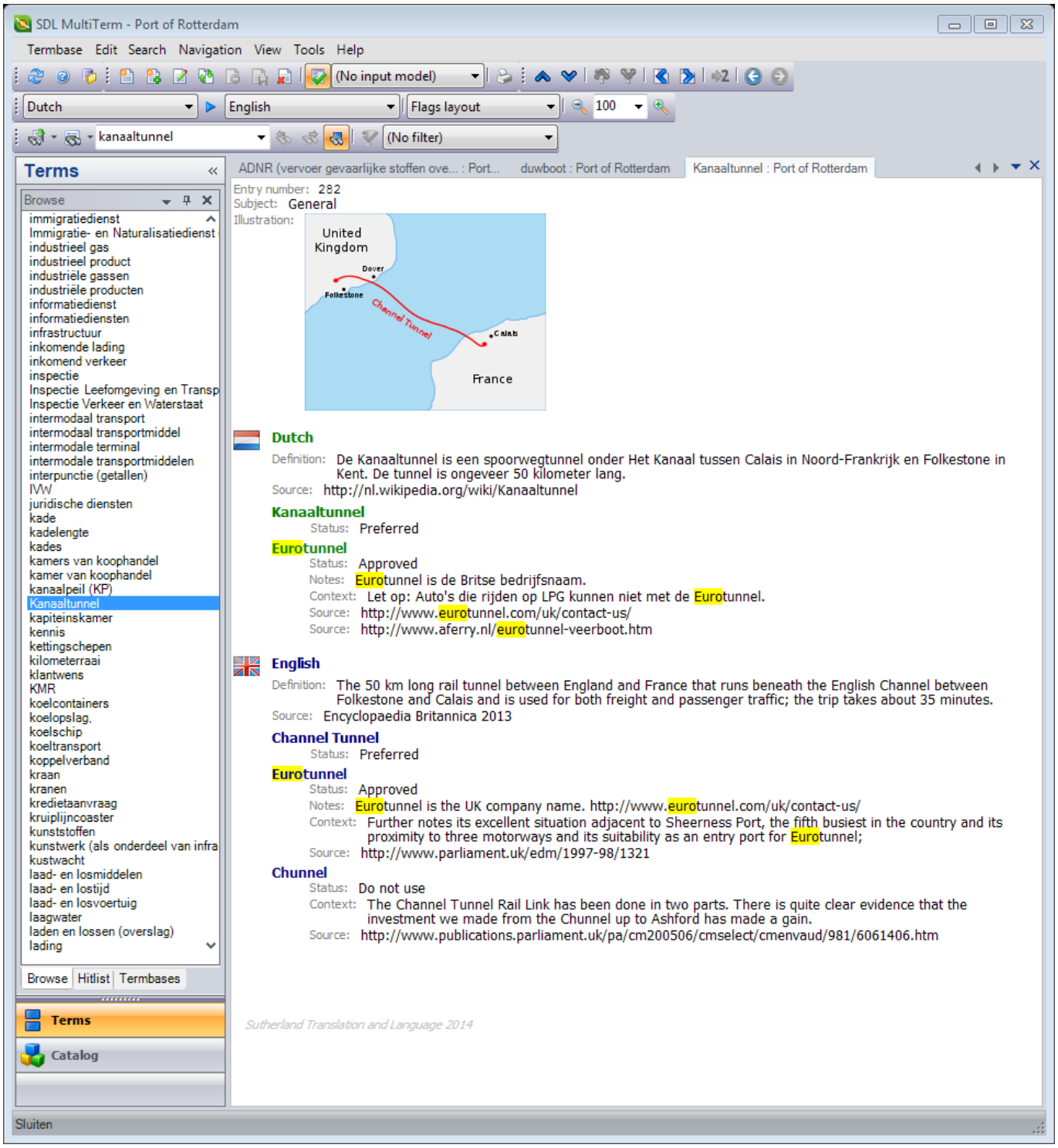
Appendix A (10)

Printscreen of *Inspectie Leefomgeving en Transport.* Port of Rotterdam termbase; entry number 637; subject General, Sea and Inland Shipping, Port Authority.



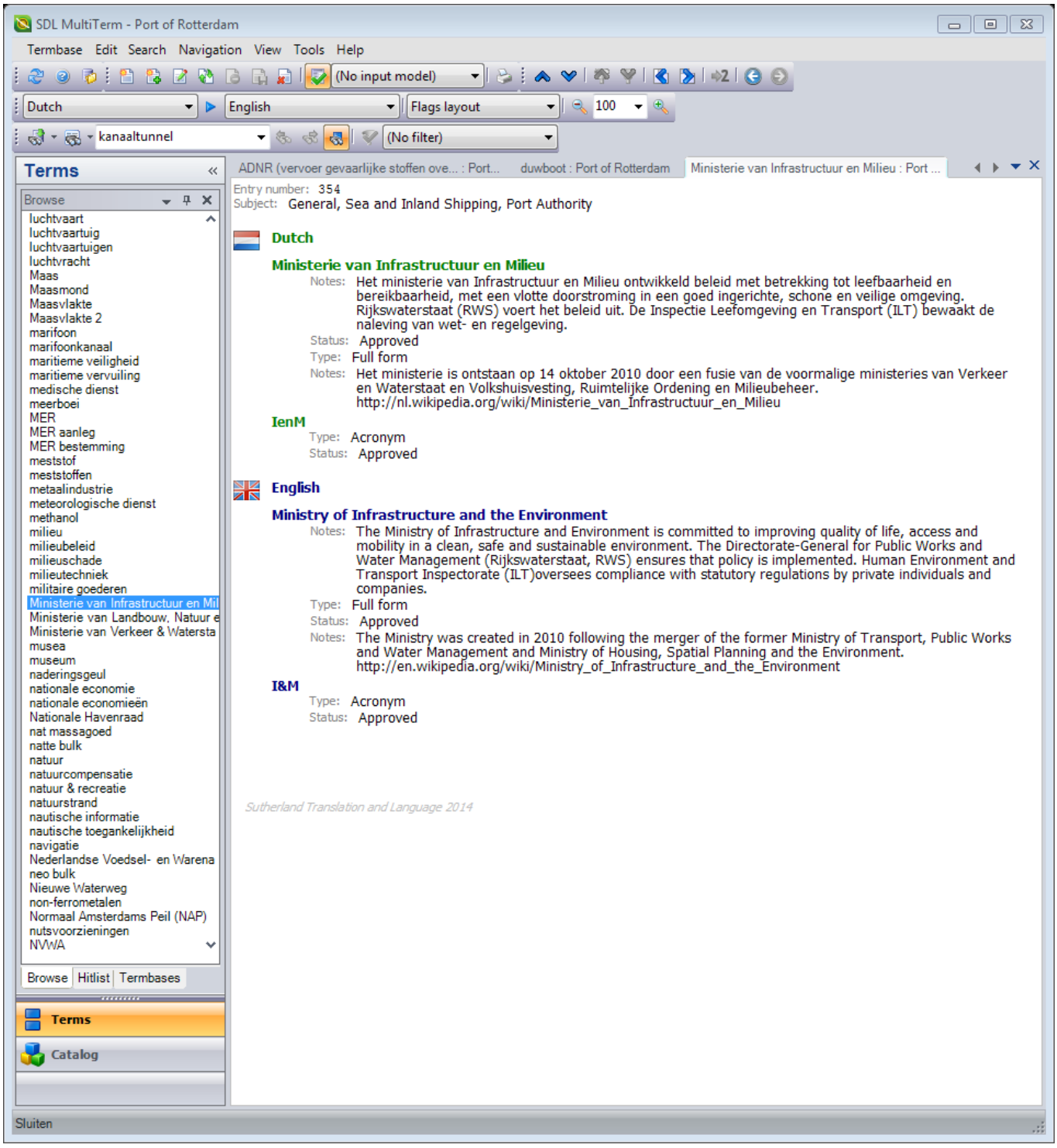
Appendix A (11)

Printscreen of *Kanaaltunnel.* Port of Rotterdam termbase; entry number 282; subject General.



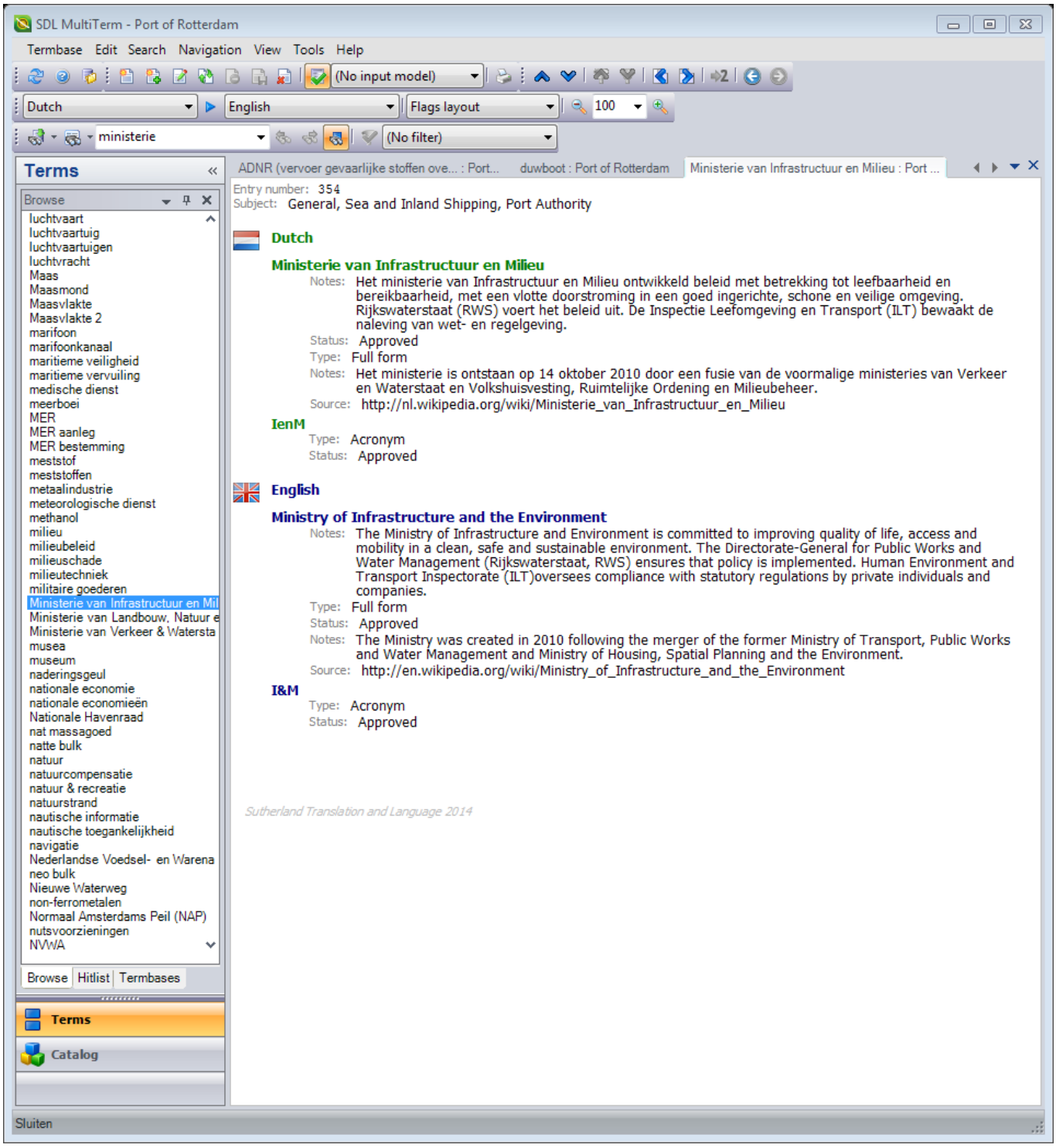
Appendix A (12)

Printscreen of *Ministerie van Verkeer en Waterstaat.* Port of Rotterdam termbase; entry number 356; subject General, Sea and Inland Shipping, Port Authority.



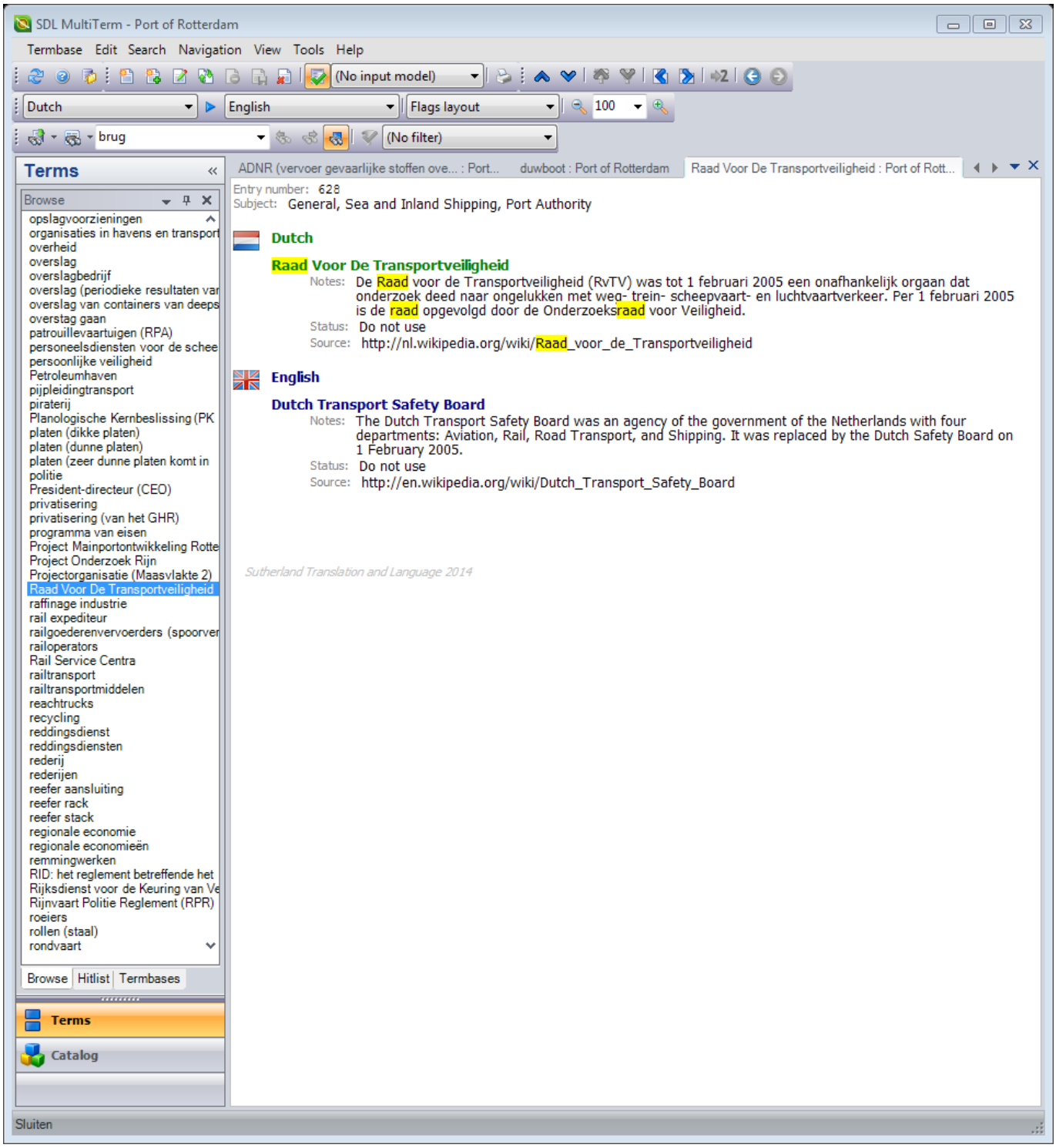
Appendix A (13)

Printscreen of *Ministerie van Infrastructuur en Milieu.* Port of Rotterdam termbase; entry number 354; subject General, Sea and Inland Shipping, Port Authority.



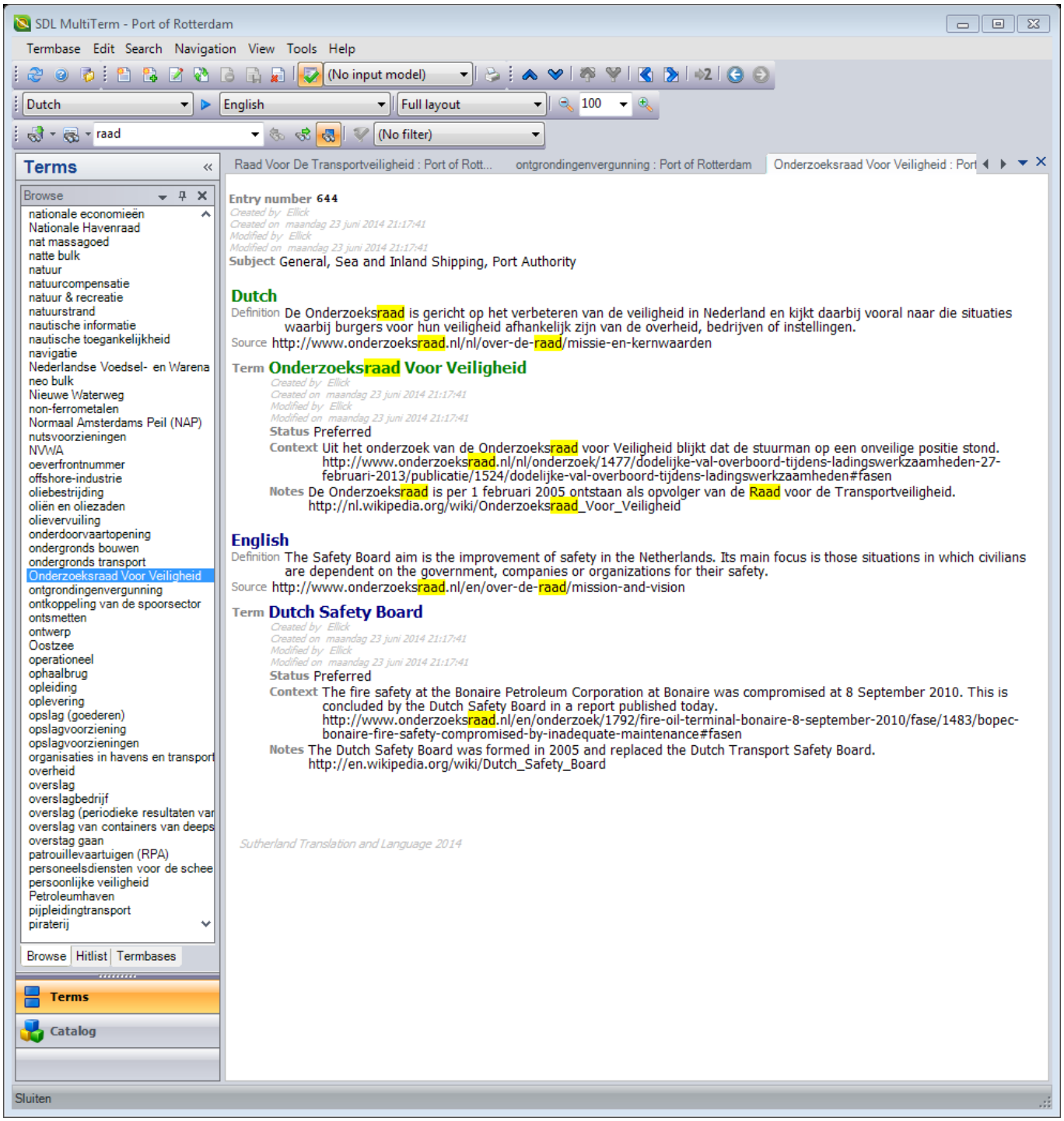
Appendix A (14)

Printscreen of *Raad Voor De Transportveiligheid.* Port of Rotterdam termbase; entry number 628; subject General, Sea and Inland Shipping, Port Authority.



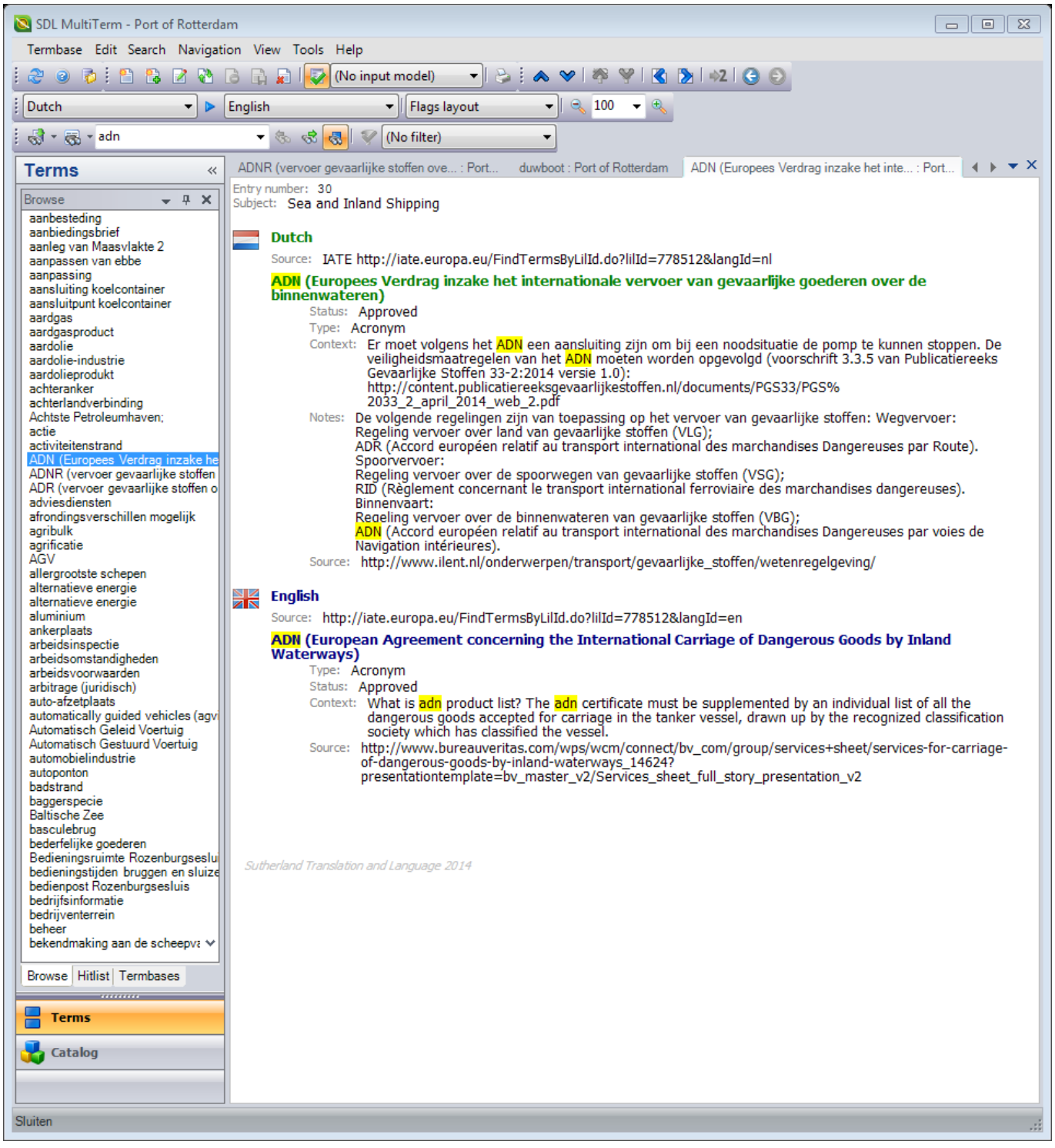
Appendix A (15)

Printscreen of *Onderzoeksraad Voor Veiligheid.* Port of Rotterdam termbase; entry number 644; subject General, Sea and Inland Shipping, Port Authority.



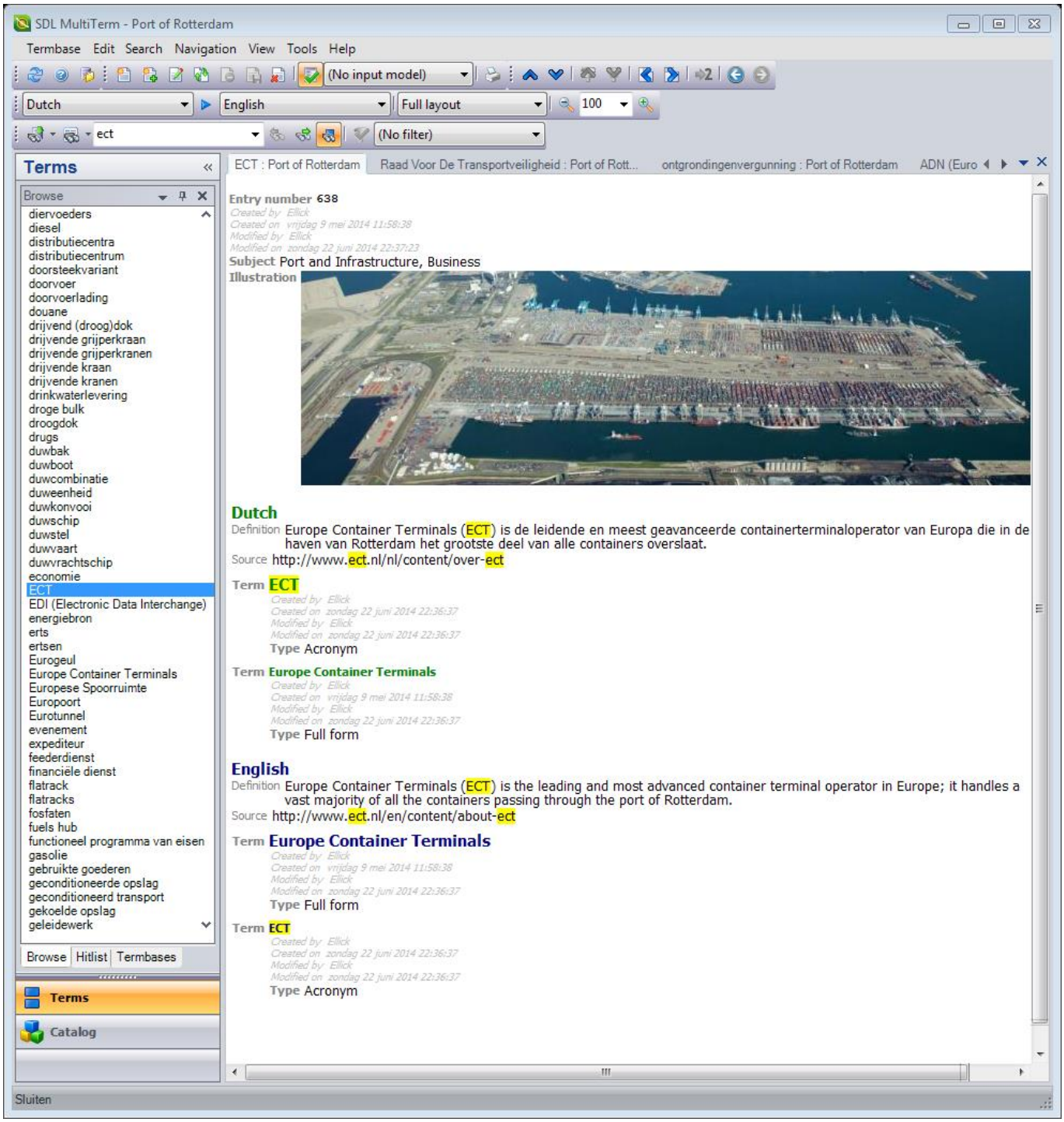
Appendix A (16)

Printscreen of *ADN (vervoer gevaarlijke stoffen met de binnenvaart).* Port of Rotterdam termbase; entry number 30; subject Sea and Inland Shipping.



Appendix A (17)

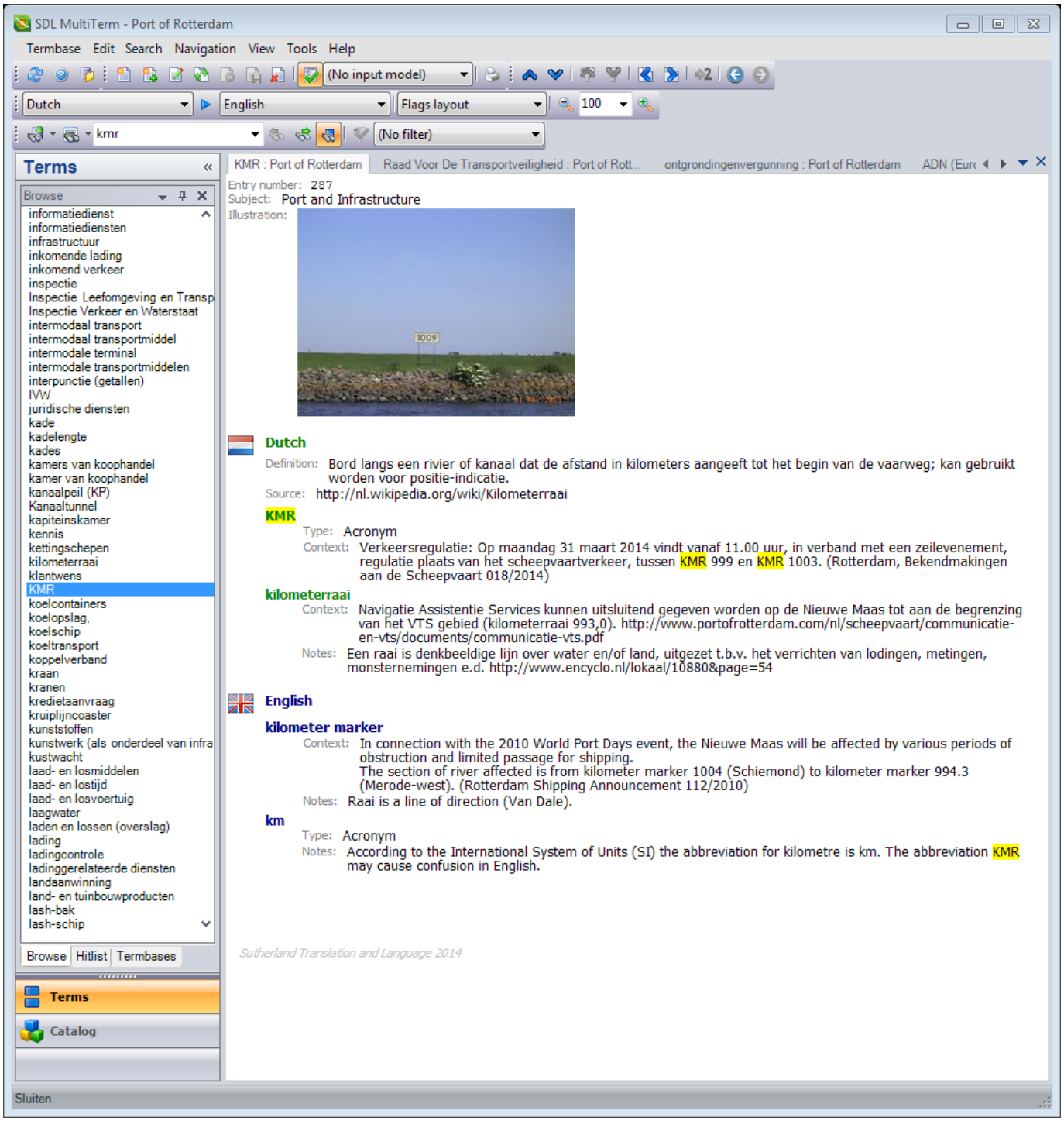
Printscreen of *ECT.* Port of Rotterdam termbase; entry number 638; subject Port and Infrastructure, Business.



Appendix A (18)

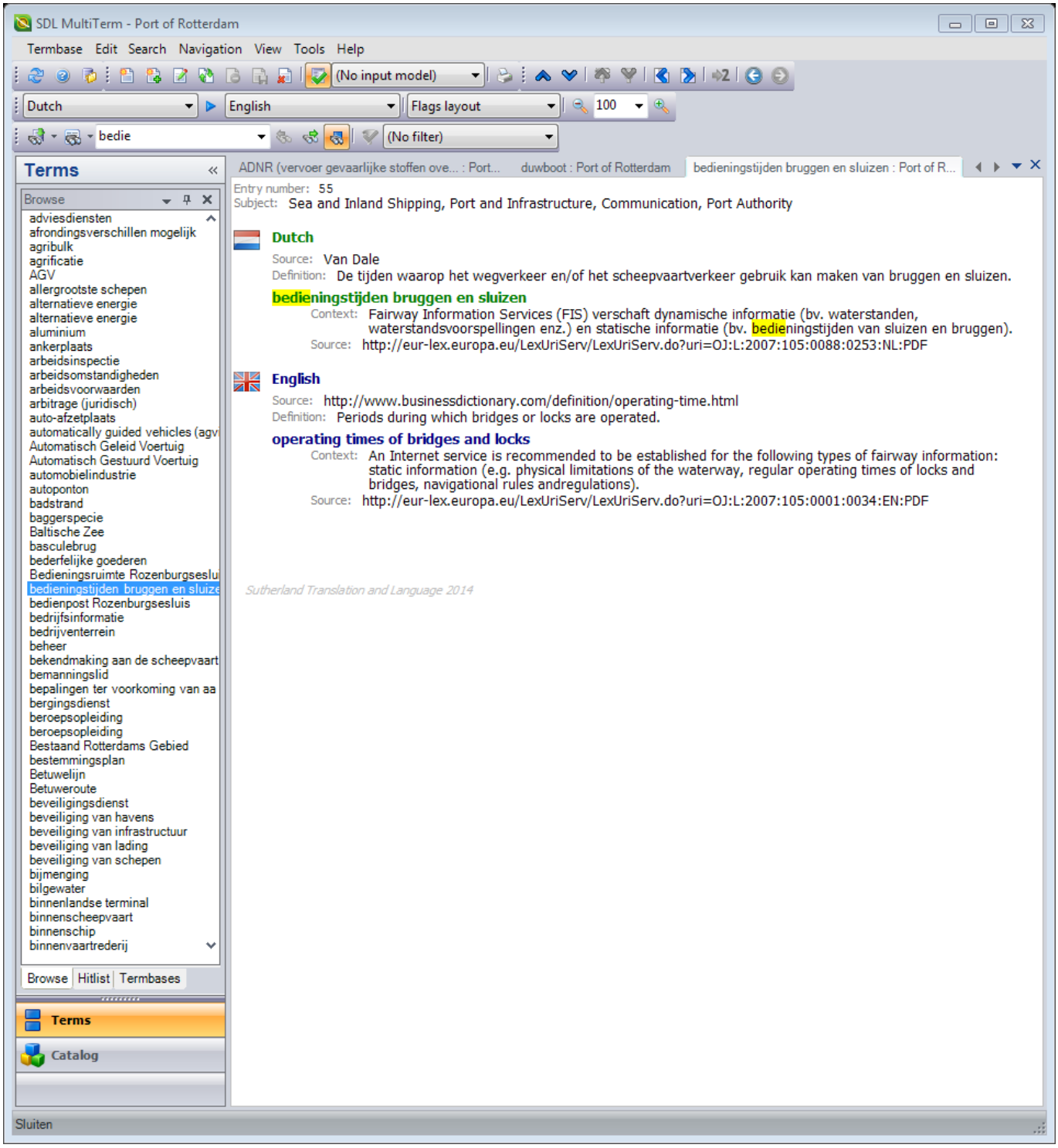
Printscreen of *kmr (kilometerraai).* Port of Rotterdam termbase;

entry number 644; subject General, Sea and Inland Shipping, Port Authority.



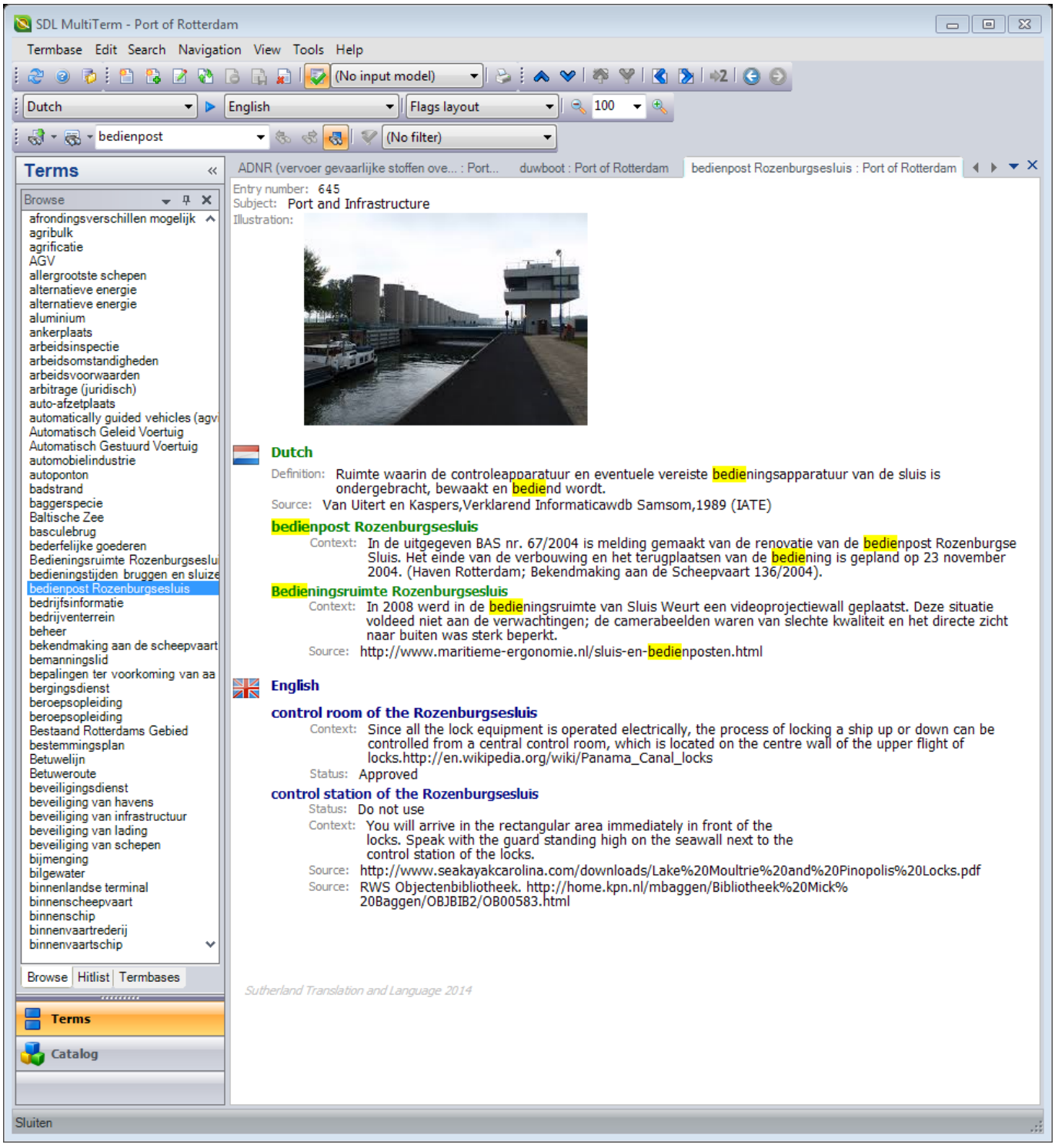
Appendix A (19)

Printscreen of *bedieningstijden bruggen en sluizen.* Port of Rotterdam termbase; entry number 55; subject Sea and Inland Shipping, Port and Infrastructure, Communication, Port Authority.



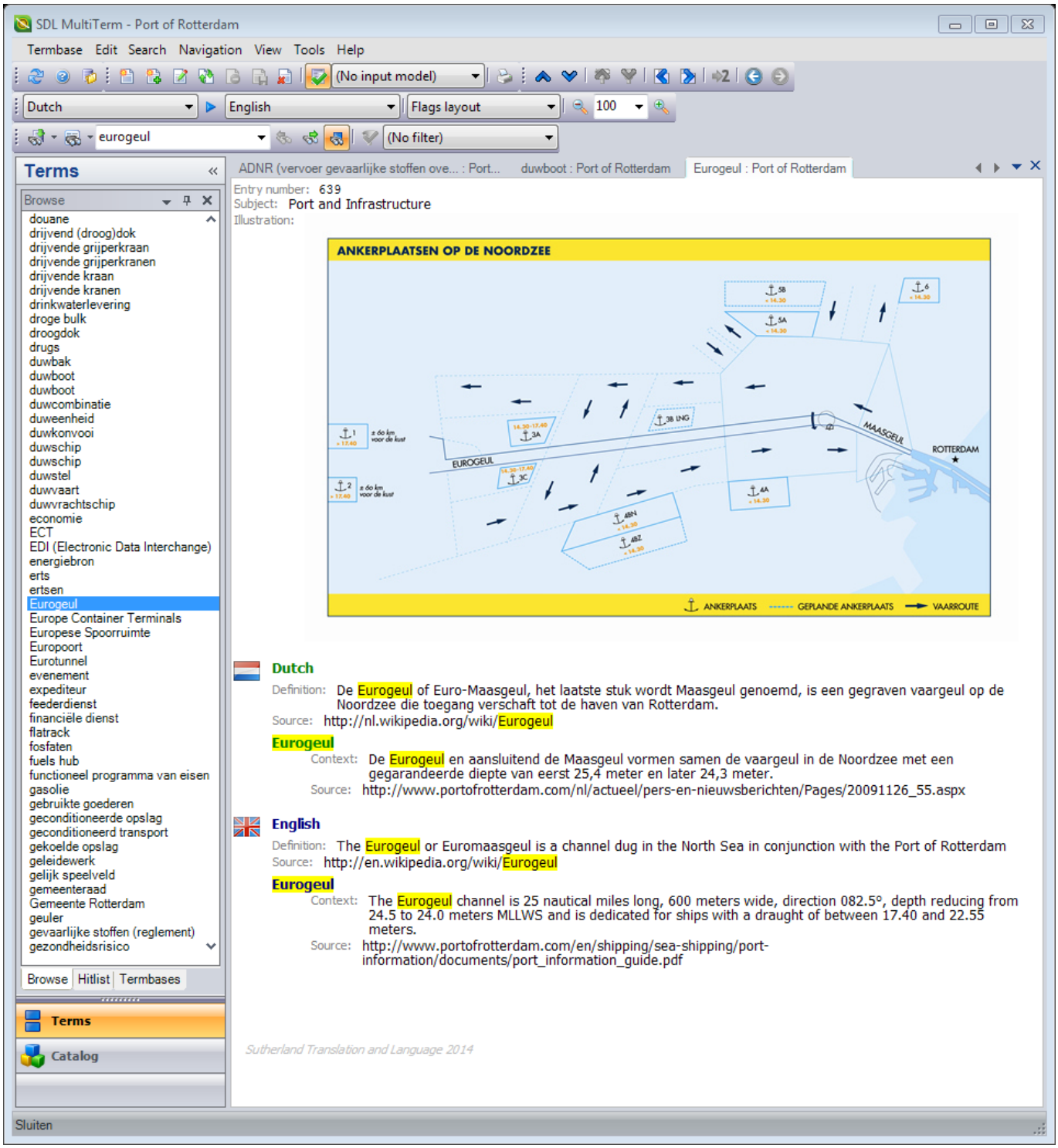
Appendix A (20)

Printscreen of *bedienpost Rozenburgse Sluis.* Port of Rotterdam termbase; entry number 645; subject Port and Infrastructure.



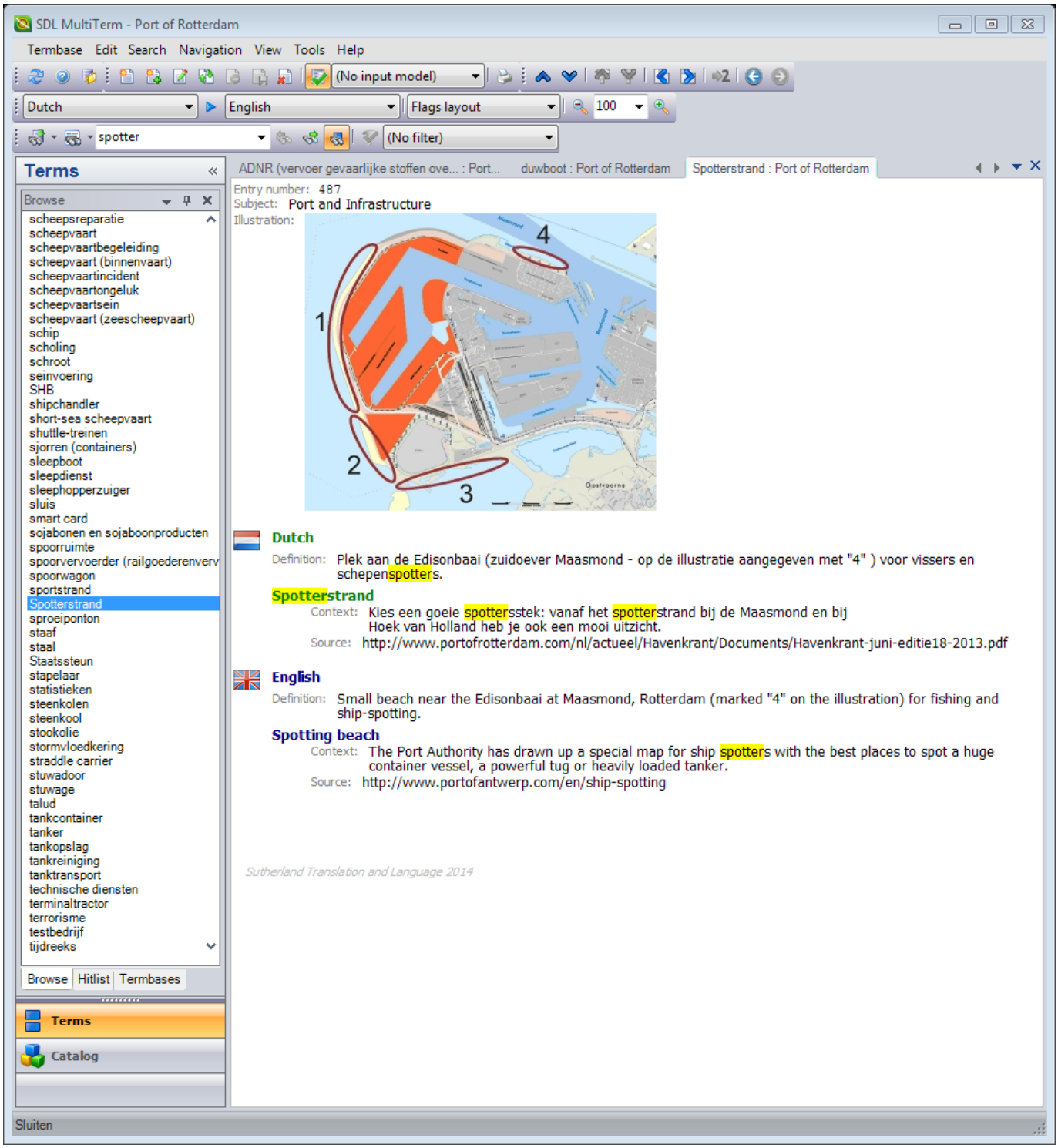
Appendix A (21)

Printscreen of *Eurogeul.* Port of Rotterdam termbase; entry number 639; subject Port and Infrastructure.



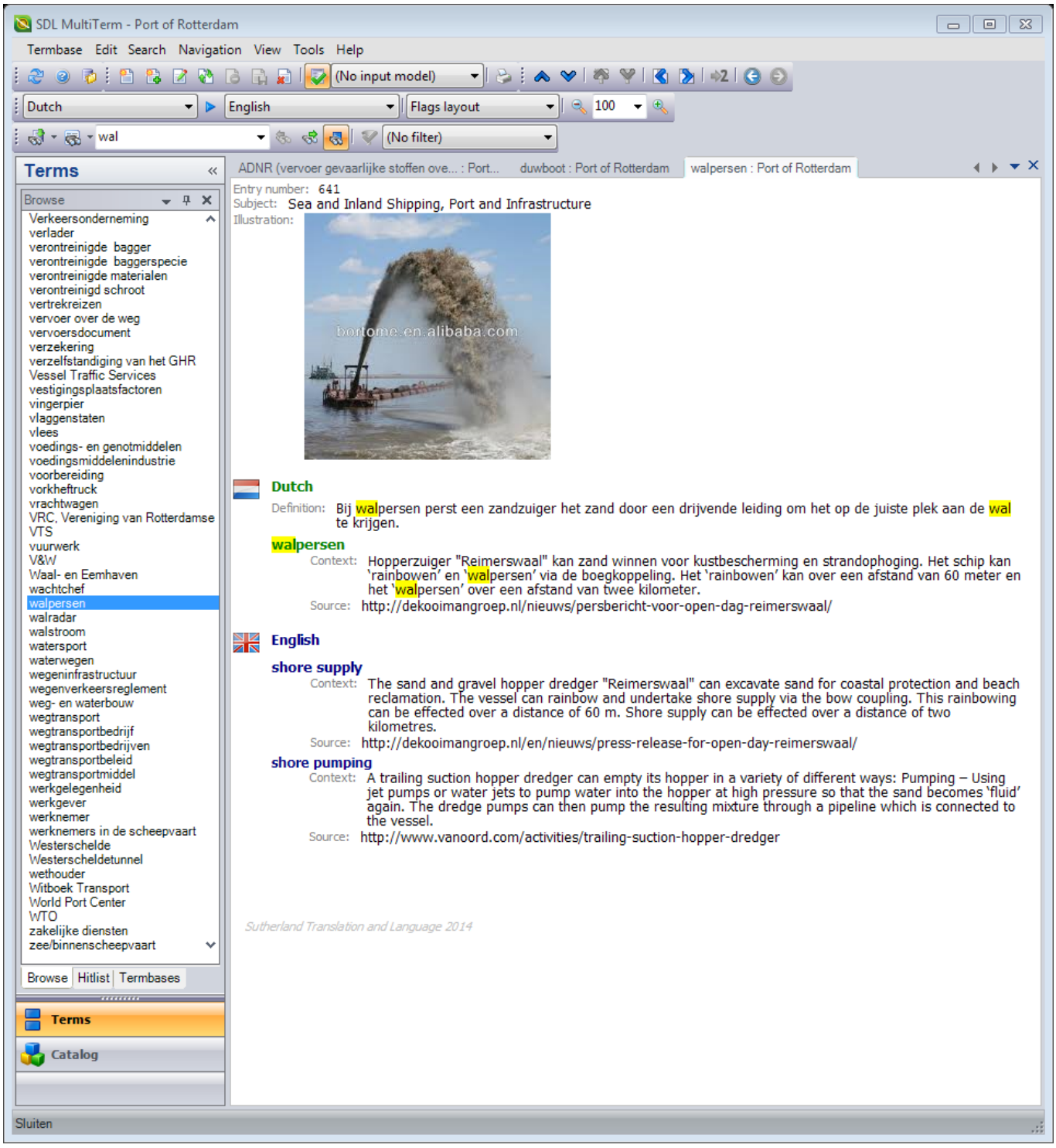
Appendix A (22)

Printscreen of *Spotterstrand.* Port of Rotterdam termbase; entry number 487; subject Port and Infrastructure.



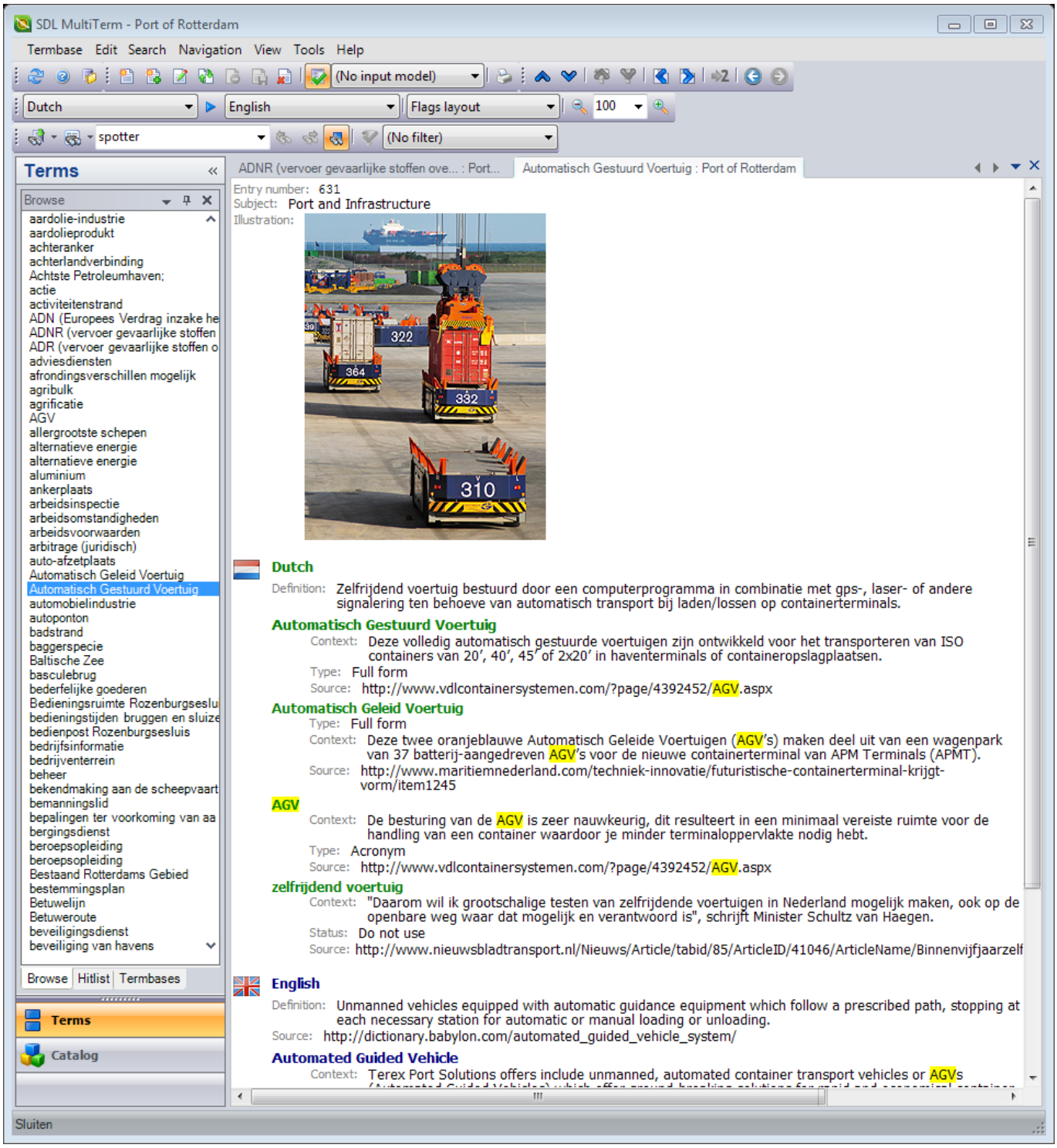
Appendix A (23)

Printscreen of *Walpersen.* Port of Rotterdam termbase; entry number 641; subject Sea and Inland Shipping, Port and Infrastructure.



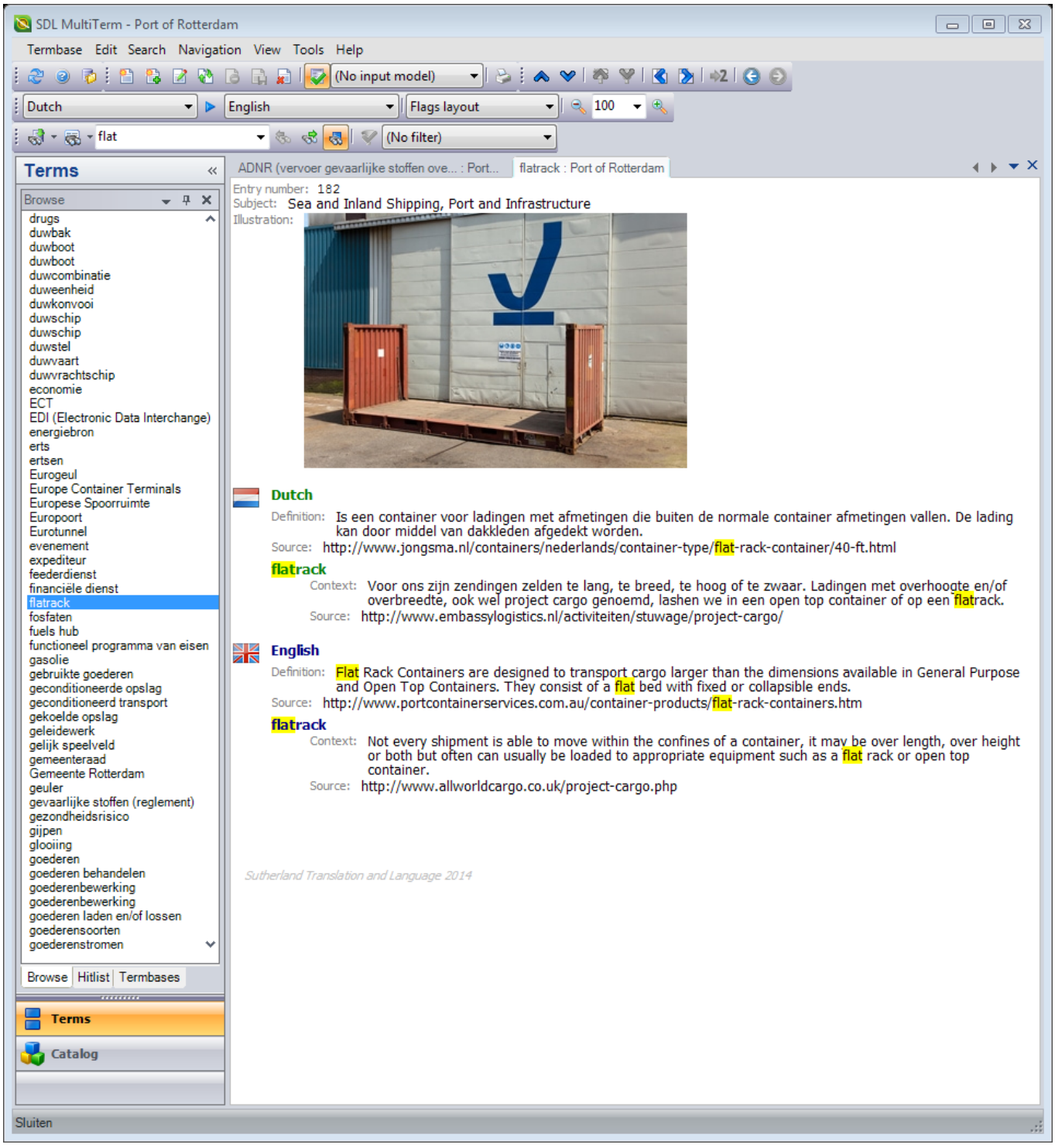
Appendix A (24)

Printscreen of *automatically guided vehicles (agvis).* Port of Rotterdam termbase; entry number 631; subject Port and Infrastructure.



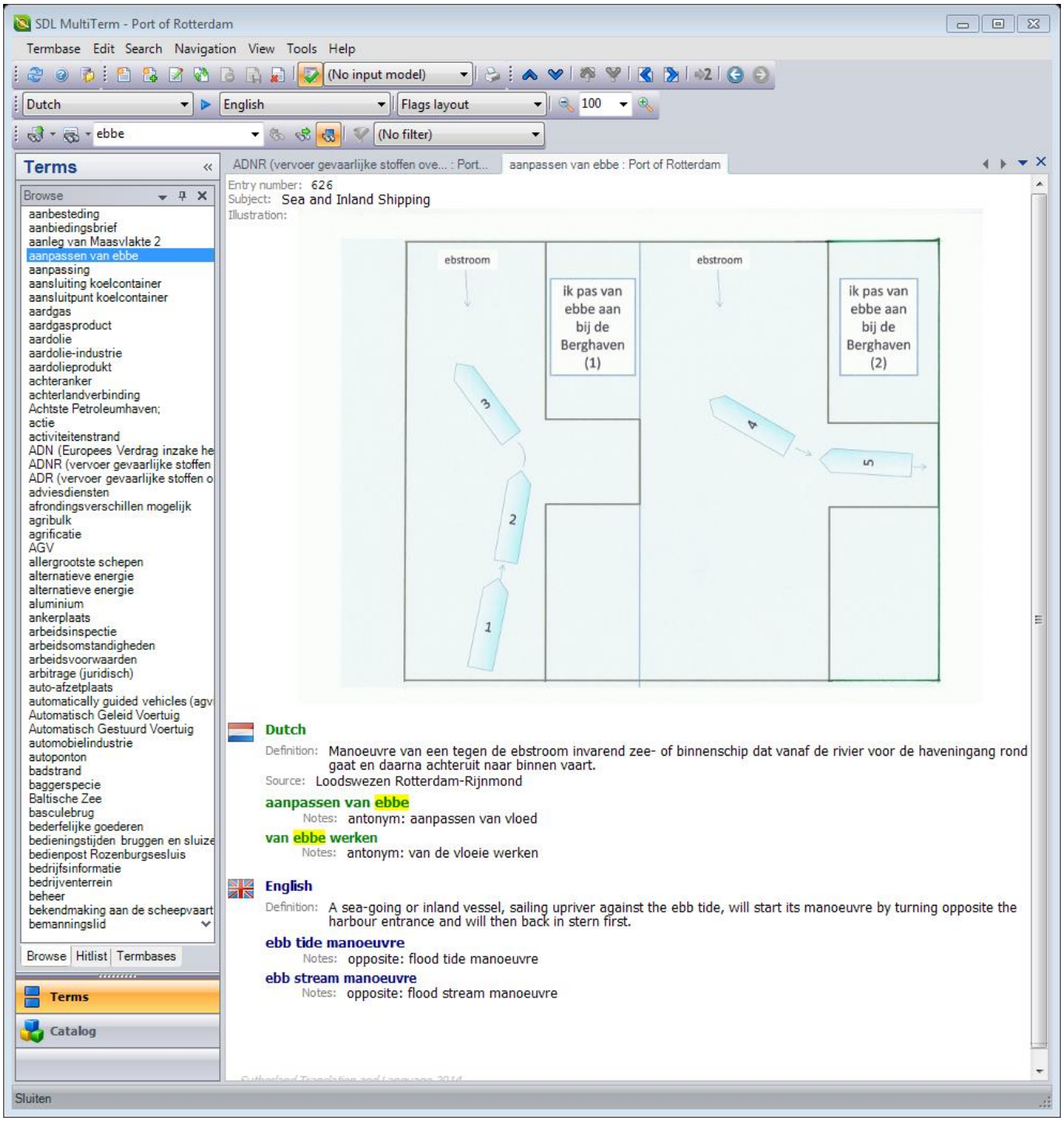
Appendix A (25)

Printscreen of *flatrack.* Port of Rotterdam termbase; entry number 182; subject Sea and Inland Shipping, Port and Infrastructure.



Appendix A (26) (Spoken Terminology)

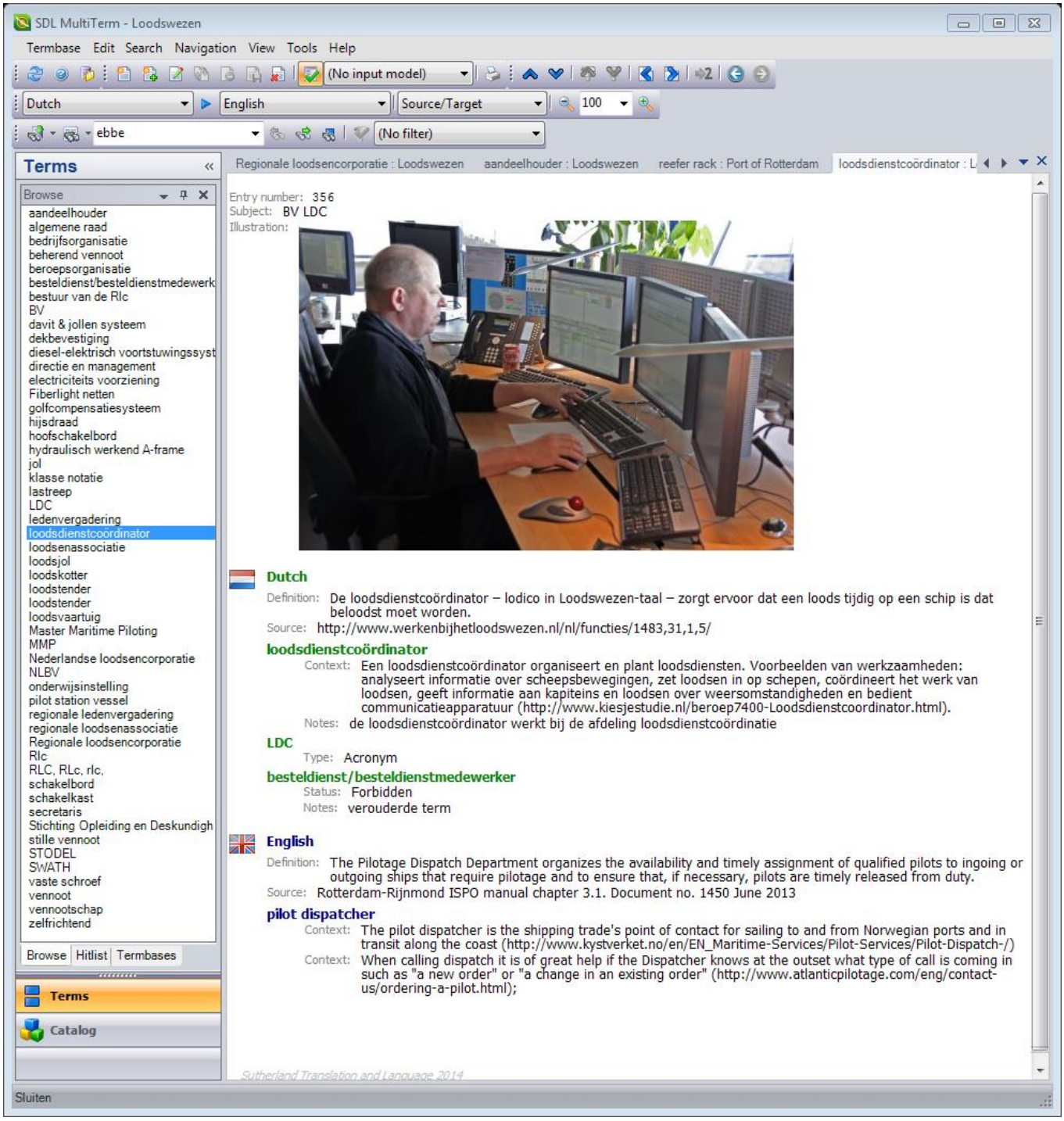
Printscreen of *aanpassen van ebbe.* Port of Rotterdam termbase; entry number 626; subject Sea and Inland Shipping.



Appendix B

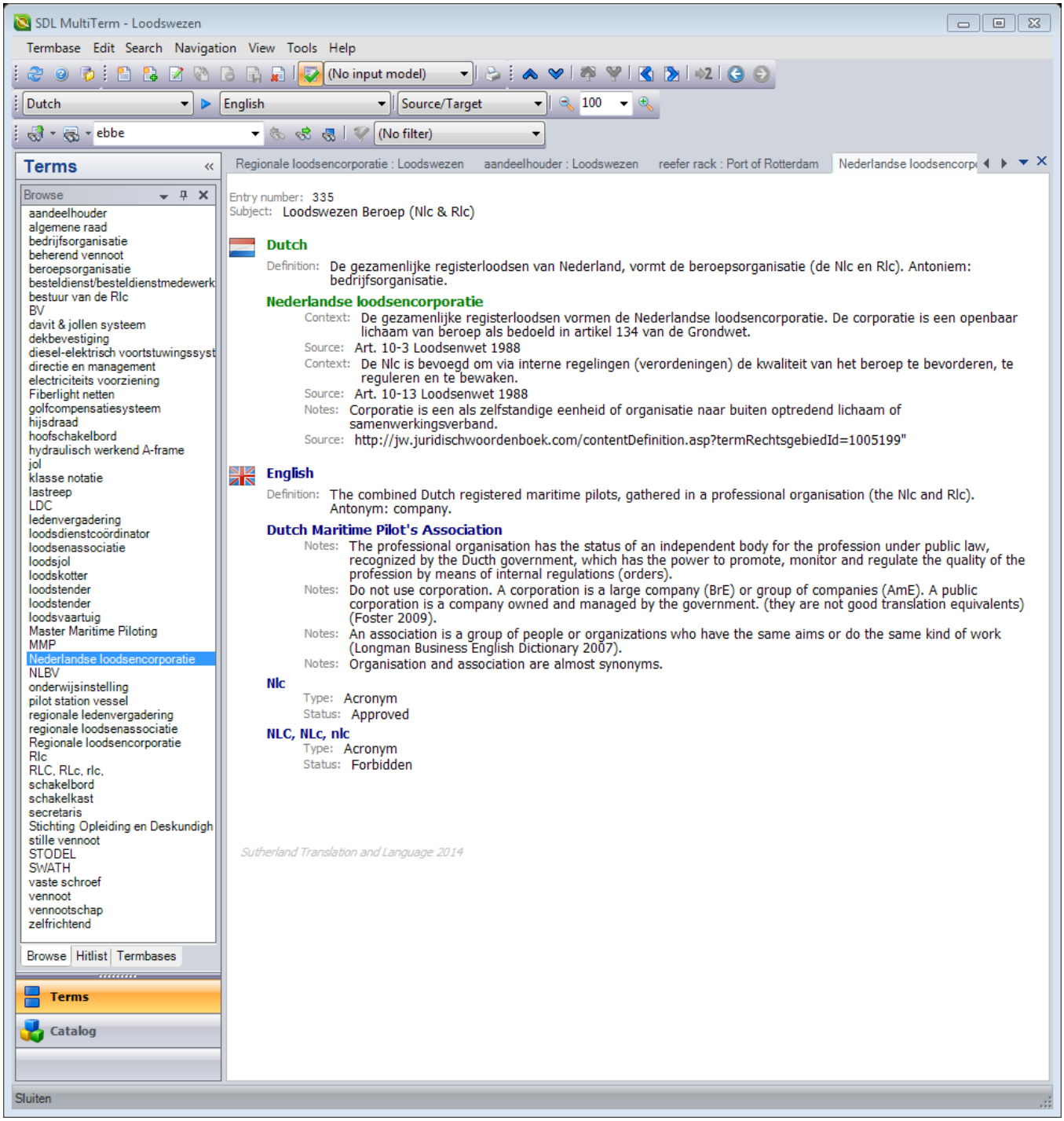
(1)

Printscreen of *loodsdienstcoördinator*. Nederlands Loodswezen termbase; entry number 356; subject BV LDC.



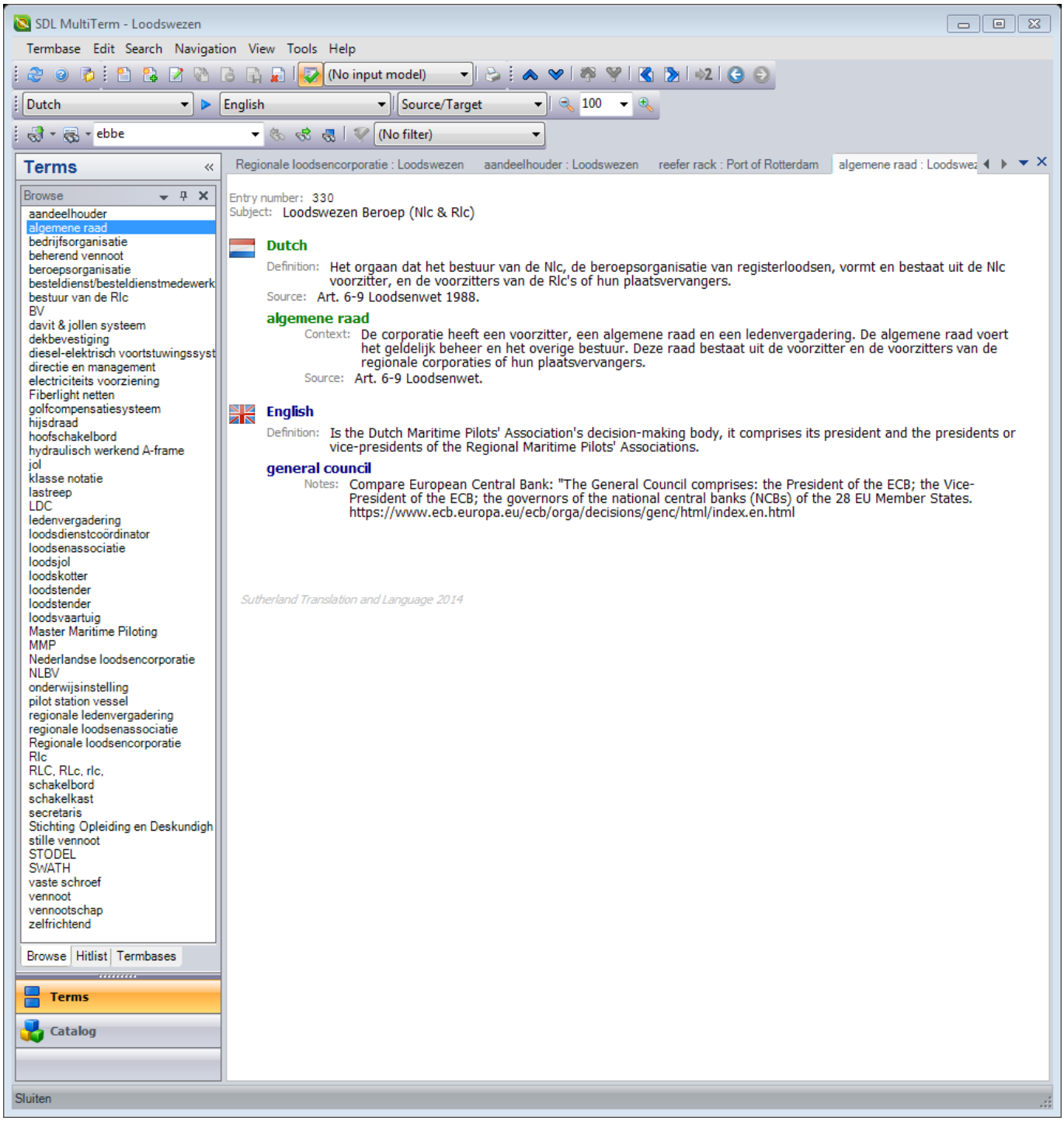
Appendix B (2)

Printscreen of *Nederlandse loodsencorporatie*. Nederlands Loodswezen termbase; entry number 335; subject Loodswezen Beroep (Nlc & Rlc).



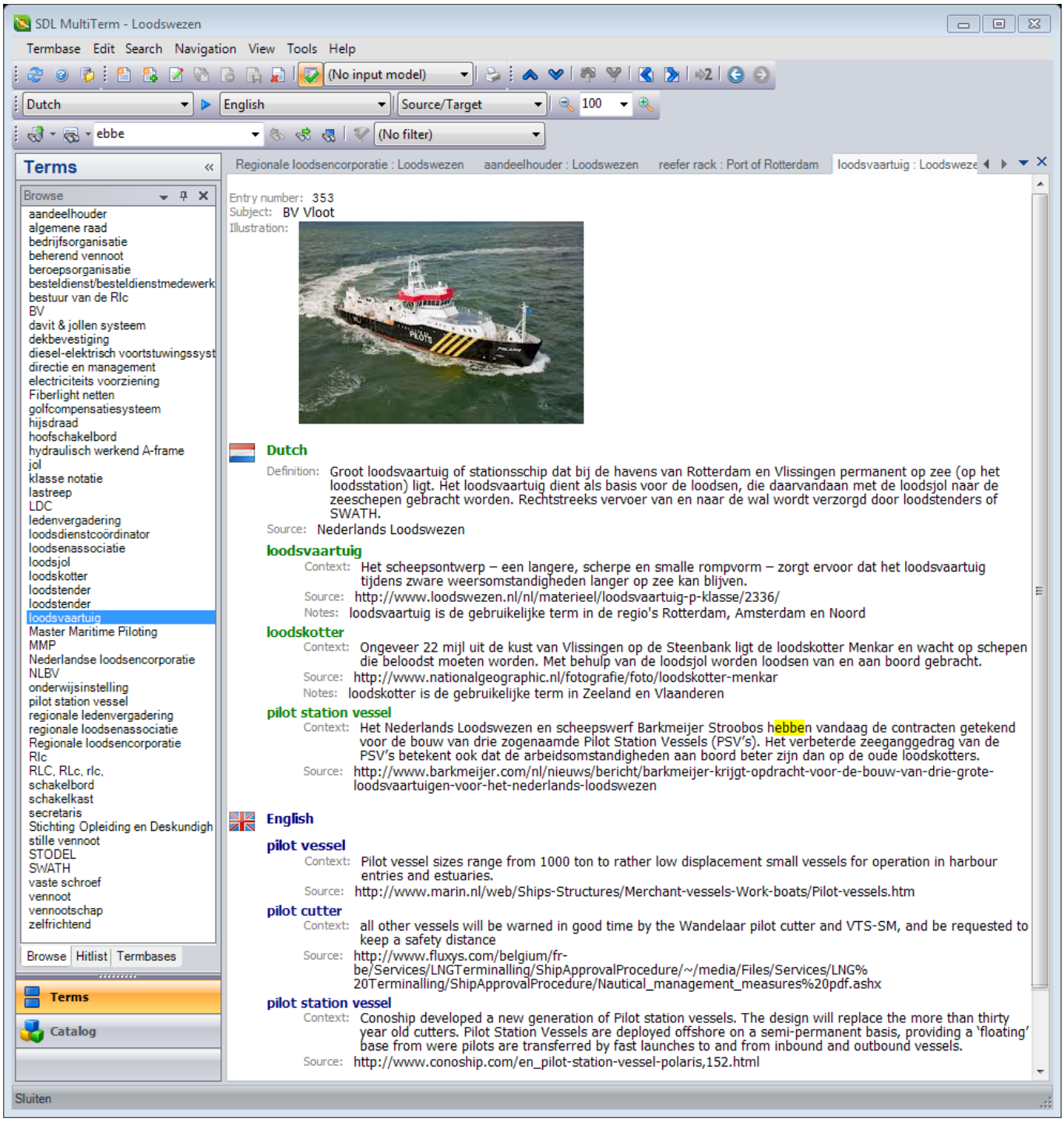
Appendix B (3)

Printscreen of *algemene raad*. Nederlands Loodswezen termbase; entry number 330; subject Loodswezen Beroep (Nlc & Rlc).



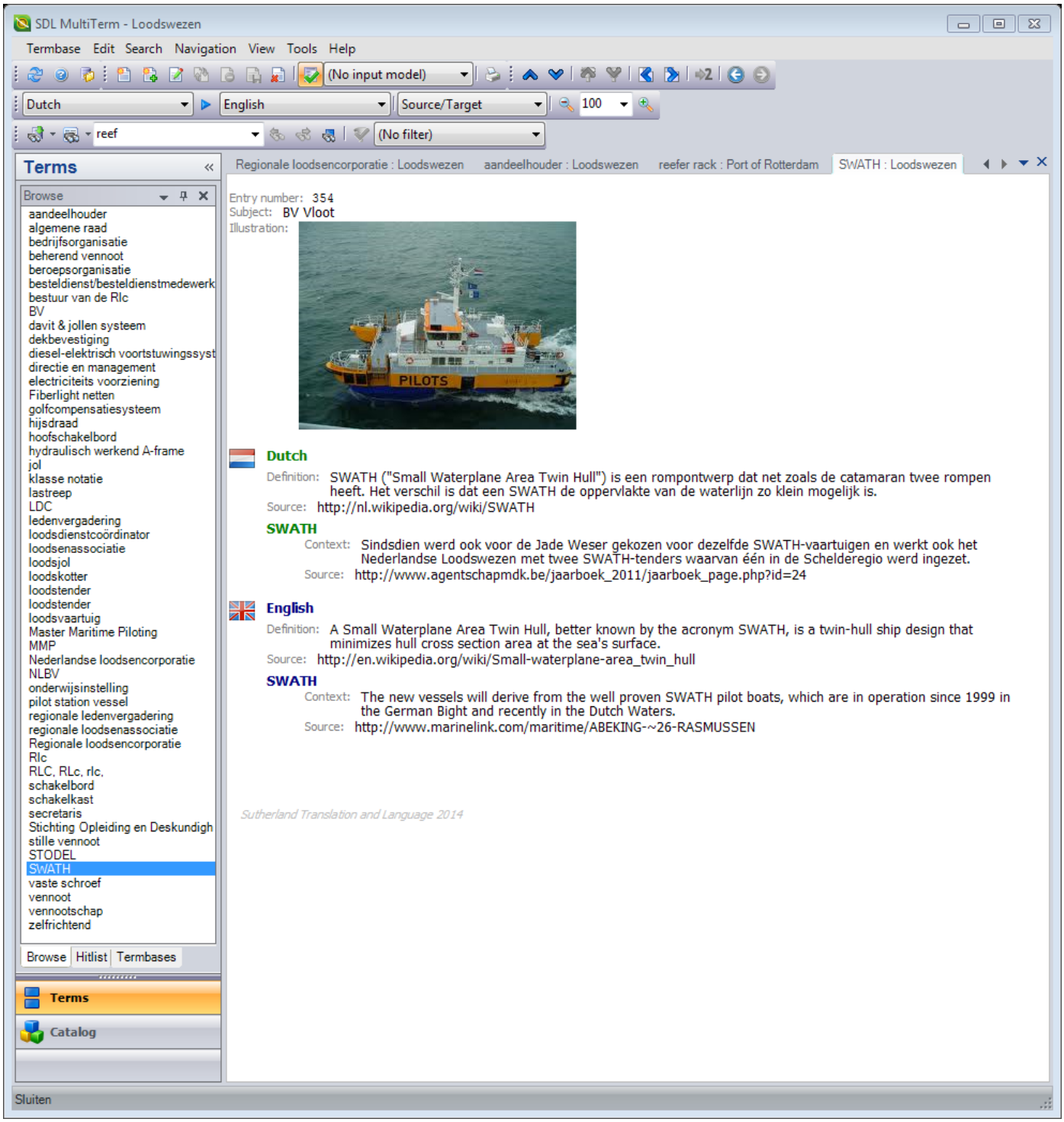
Appendix B (4)

Printscreen of *pilot station vessel*. Nederlands Loodswezen termbase; entry number 353; subject BV Vloot.



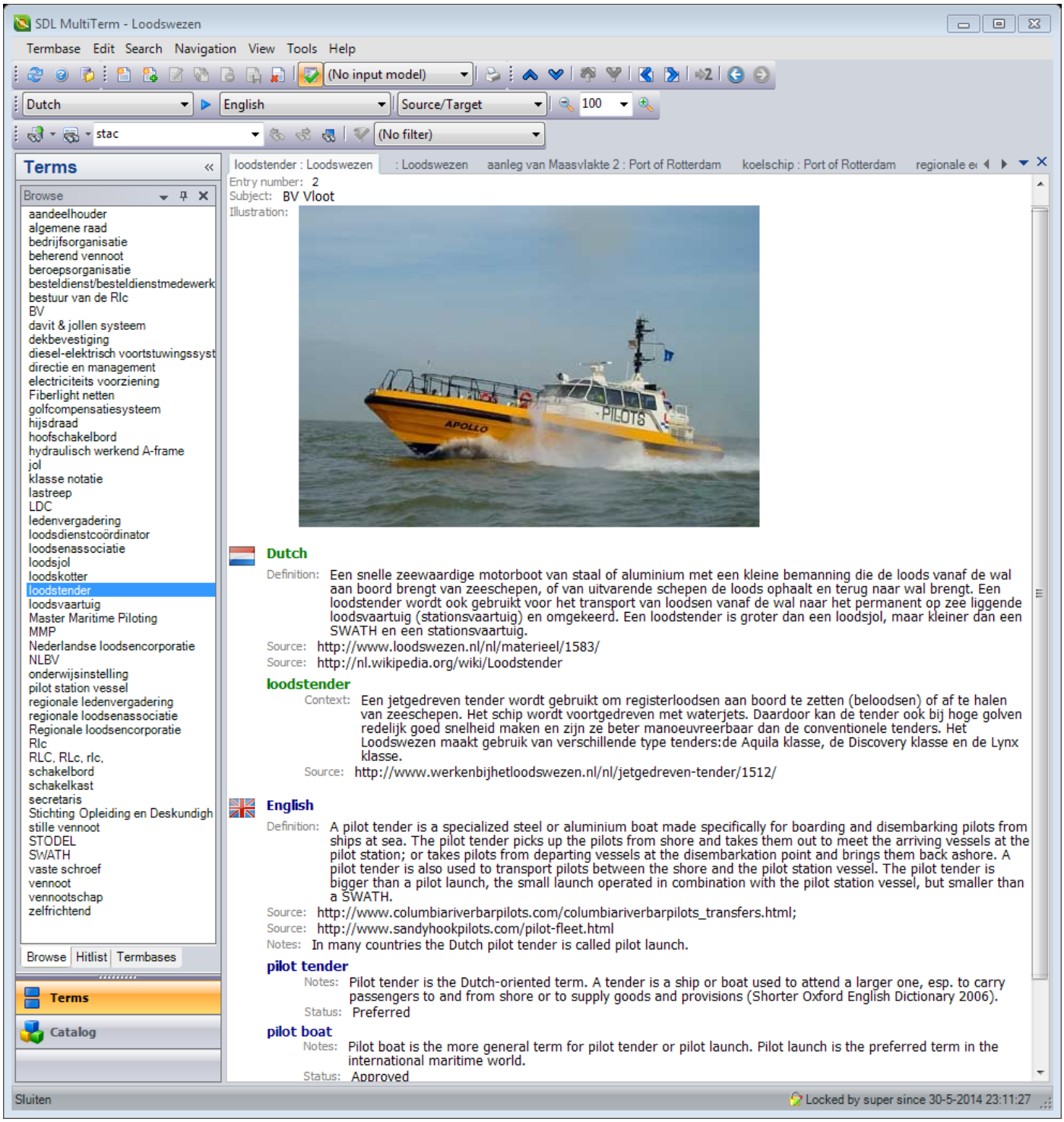
Appendix B (5)

Printscreen of *SWATH*. Nederlands Loodswezen termbase; entry number 354; subject BV Vloot.



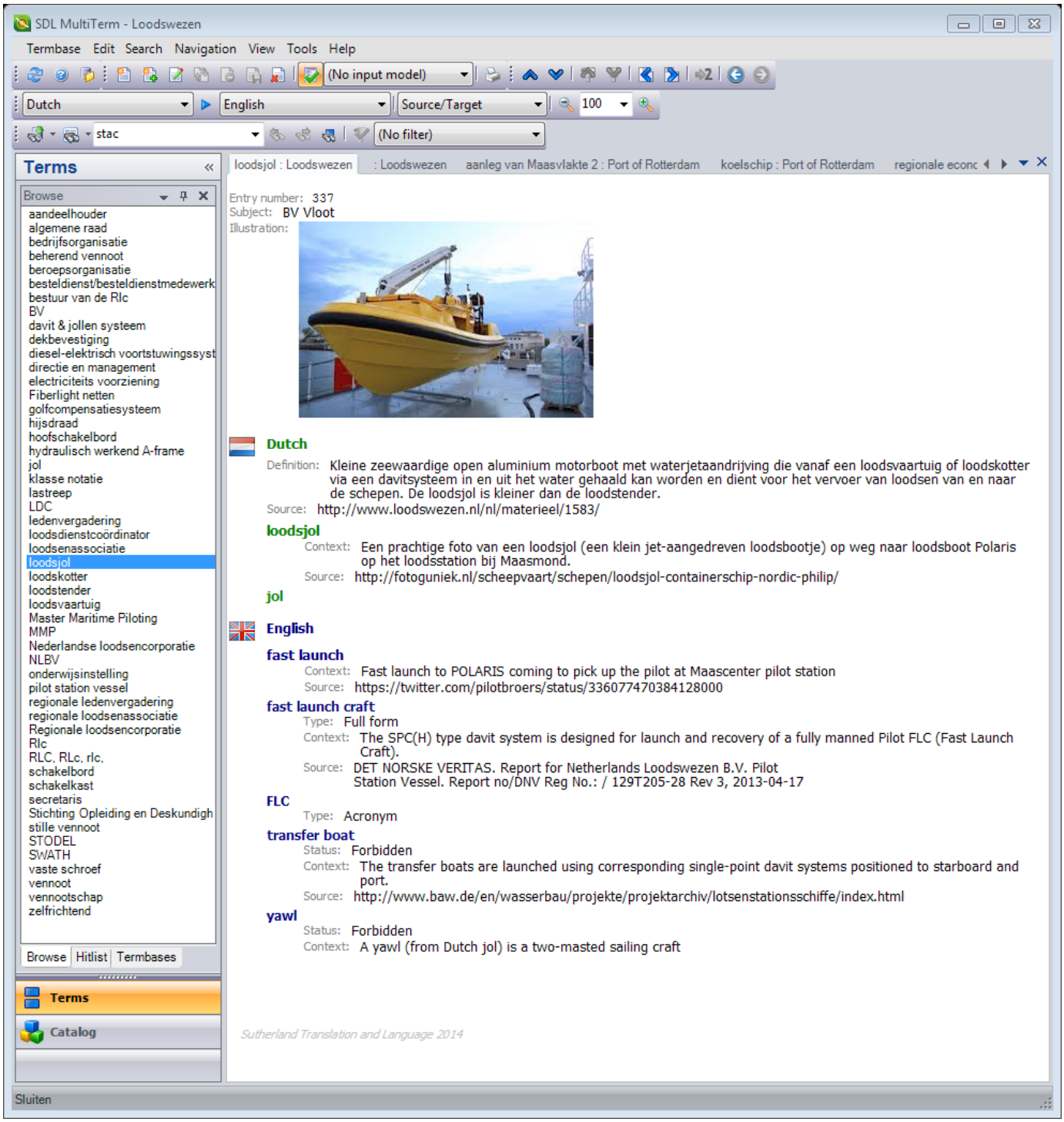
Appendix B (6)

Printscreen of *loodstender*. Nederlands Loodswezen termbase; entry number 2; subject BV Vloot.



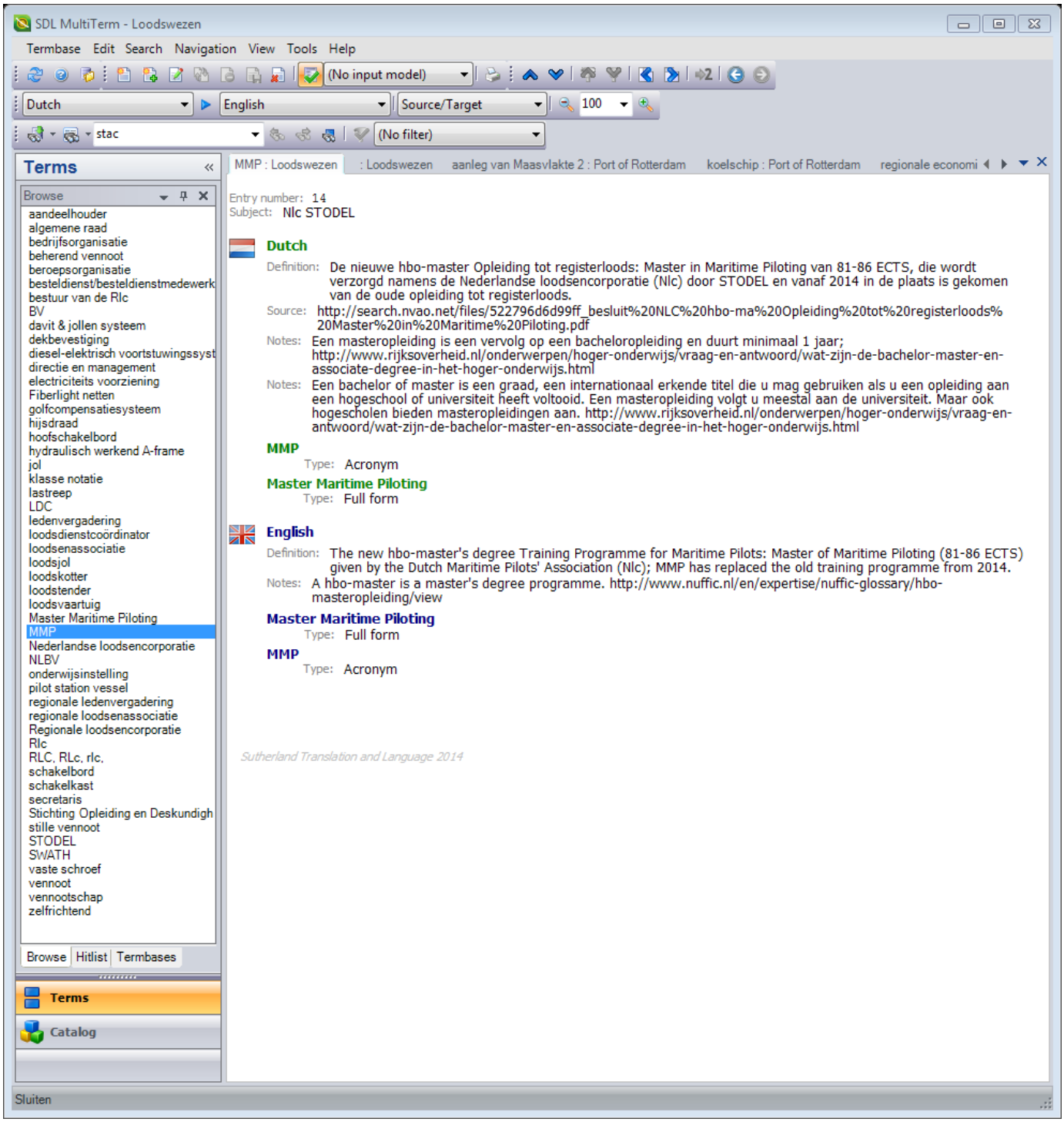
Appendix B (7)

Printscreen of *loodsjol*. Nederlands Loodswezen termbase; entry number 337; subject BV Vloot.



Appendix B (8)

Printscreen of *MMP*. Nederlands Loodswezen termbase; entry number 14; subject Nlc STODEL.



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