

Shipbuilding IPR Study

**An analysis of problems relating to the protection of
Intellectual Property Rights of the European shipbuilding industry**

Final report

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Glossary

ACEA	European Automobile Manufacturers' Association
AIC	Administration of Industry and Commerce
AQSIQ	Administration for Quality Supervision, Inspection and Quarantine
ARC	Authorised Release Certificate
ASEAN	Association of South-East Asian Nations
BASCAP	Business Action to Stop Counterfeiting and Piracy
CDR	Community Design Courts
CESA	Community of European Shipyards Association
CGT	Compensated gross tonnage
COREDES	Committee for Research and Development in European Shipbuilding
DWT	Deadweight tons
EC	European Community
ECJ	European Court of Justice
EEC	European Economic Community
EJV	Equity Joint Venture
EMEC	European Marine Equipment Council
EMECrid	EMEC working group on Research, Development and Innovation
EPC	European Patent Convention
EPLA	European Patent Litigation Agreement
EPO	European Patent Office
EU	European Union
GAC	General Administration of Customs
GT	Gross tons
IATA	International Air Transport Association
ICC	International Chamber of Commerce
ICT	Information and Communication Technology
IP	Intellectual Property
IPR	Intellectual Property Right
IPT	Intellectual Property Tribunal
JV	Joint Venture
KCS	Korea Customs Service
KFTC	Korea Fair Trade Commission
KIPO	Korean Intellectual Property Office
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MEMA	Motor & Equipment Manufacturers Association

MOCT	Ministry of Culture and Tourism (South-Korea)
NACE	Nomenclature générale des Activités économiques dans les Communautés Européennes
NCA	National Copyright Administration
OHIM	Office for Harmonisation in the Internal Market
PCT	Patent Cooperation Treaty
PRC	People's Republic of China
PSB	Public Security Bureau
R&D	Research and Development
RD&I	Research, Development and Innovation
Rmb	Chinese Ren Min Bi
RoRo	Roll-on Roll-off
SAIC	State Administration for Industry and Commerce
SIPO	State Intellectual Property Office
SME	Small and Medium-sized Enterprise
SPPO	Supreme Public Prosecutor's Office
TFA	Technology Transfer Agreements
TRIPs	Trade-Related Aspects of Intellectual Property Rights
UN	United Nations
WCO	World Customs Organisation
WFOE	Wholly Foreign Owned Enterprise
WIPO	World Intellectual Property Organisation
WTO	World Trade Organisation

Preface

At the beginning of 2007, the European Commission awarded the contract to conduct the 'Shipbuilding IPR Study' to Houthoff Buruma and Policy Research Corporation. These two parties subsequently worked closely together to provide the Commission with an adequate and comprehensive report.

In essence, the report sets out to answer the related questions of how the European shipbuilding industry protects its Intellectual Property (IP), the damage the industry suffers from infringements on their Intellectual Property Rights (IPR) and how the present system of IPR protection could be improved.

It goes without saying that this report has not been a sole effort by Houthoff Buruma and Policy Research Corporation. CESA and EMEC, the European umbrella organisations for the shipbuilding and the marine equipment industry respectively, have in particular played an important role by providing data and contacts, as well as feedback to earlier versions of this report. For this we are very grateful.

We also kindly acknowledge the contributions of many individual European shipbuilders, equipment providers, their national organisations and all other persons and organisations that have contributed to this report. To our mind, the responsiveness of these parties illustrates the seriousness of the problem under investigation and the urgency felt by the industry.

Finally, we would like to express our gratitude to the other members of the team of Houthoff Buruma (Freya van Schaik, Folkert Wilman, Valerie-Anne Houppermans and Grégoire Ryelandt) and Policy Research Corporation (Gosse Corstiaensen) as well as the European Commission for the pleasant and constructive cooperation throughout the course of this study.

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Executive summary

The European shipyards (as key organisers in the complex shipbuilding process) and the marine equipment suppliers (as producers of often innovative parts and complex integrated solutions) have jointly demonstrated over the years that they are in many cases able to fight the competition through innovation. Besides product innovation, design and process innovation are the key driving forces behind the evolution of the shipbuilding industry.

This study reveals that even though especially the bigger players do use both the classical instruments of IP protection and contractual clauses, a significant part of the innovations in the shipbuilding industry is not (fully) protected. This is, however, not primarily due to the substantive characteristics of the current legal framework on the national, European or international level. Though there is indeed room for improvement (e.g. the introduction of a Community patent), overall the legal framework is in itself not inadequate for the protection of IP. Rather, the suboptimal use of the existing possibilities of IP protection appears to be caused by a range of other issues, including enforcement difficulties, the costs of adequate protection, a lack of awareness in the industry and hesitations with regard to taking legal steps out of fear of harming business relations .

Clear examples of IPR infringements can be found, but are not abundant. The field research suggests that the direct economic impact of the (detected) IPR infringements amounts on average to a few percent of turnover at most. This number should be interpreted with care however. Firstly, the present study illustrates that by no means all IPR infringements will be detected and pursued by the companies concerned. Secondly, the indirect effect that the sector's position is undermined by the constant threat of 'leakage' of innovations may be of significant importance as well. Thirdly, on a company level, IPR infringements that represent a relatively limited direct financial loss may very well drive certain companies out of the market when the IPR infringed upon is crucial to their competitive position. The value at stake rises considerably with these considerations, but the data availability is insufficient to determine this impact.

Taking into account the relativity of the direct economic effects of the leaking away of technological knowledge and the fact that other sectors clearly struggle with similar problems, with a few notable exceptions there does not seem to be a justification for special legislative measures that exclusively apply to the shipbuilding industry. However, this does not mean that nothing can be – or indeed should be – done to support the European shipbuilding industry in this regard. On the contrary, the present study indicates that the industry could significantly benefit from a range of practical, well-targeted

measures. Concretely, ten policy recommendations aimed at achieving a more effective protection of IPR are suggested.

The first group of policy recommendations focuses, broadly speaking, on making better use of the existing instruments. In particular, this could be done by diminishing burdens to obtaining IP protection, investing in methods of (cost-) sharing with regard to innovation and the protection thereof, increasing awareness (especially for SMEs) as well as working towards an EU IP Charter to manage public-private research cooperation.

A second group of policy recommendations relates primarily to tackling enforcement and IP 'leakage' issues. Given the international nature of the problem under consideration, solutions to the pressing matter of ensuring effective enforcement in particular need to be found through international cooperation and coordination. A more specific matter that deserves consideration is the limitations that follow from Article 5ter of the Paris Convention. Furthermore, through specific customs measures and the use of identification methods to distinguish between original and fake, the scope for effective enforcement could be further improved. In this context, the role of the classification societies also needs reviewing. Finally, it is submitted that the concept of 'open innovation' deserves more attention as a potentially very useful complementary or alternative manner of viewing innovation and intellectual property in the European shipbuilding industry.

1. Introduction

1.1. Background

It is no exaggeration to state that innovation lies at the heart of European policy towards industry in general and towards its shipbuilding sector in specific.

The background to this policy is primarily made up by the 2000 Lisbon European Council, which sets an ambitious strategic goal for Europe: to become, by 2010, the most competitive and dynamic knowledge-based economy in the world. Additionally, the European shipbuilding industry has initiated and developed the LeaderSHIP 2015 programme. This programme is a response to the competitive challenges the sector faces and aims at maintaining and consolidating the global number one position in terms of innovative capacity. More specifically, it aims at improving leadership in selected market segments, continuing to drive and protect innovation, strengthening customer focus, improving the structure of the industry, implementing a network-driven operating mode, emphasising production optimisation and shifting towards knowledge-based production.

In order to achieve these goals, *innovation* and *maximising the benefits of knowledge* are important prerequisites. Stepping up efforts to innovate is, of course, an important element in this respect. Much attention has therefore already been paid to facilitate and stimulate innovation in the European shipbuilding sector.

The industry¹ will, however, not fully reap the benefits of these efforts without sufficient means to protect this innovation adequately. The European shipbuilding industry can only maximise the benefits of its innovation and knowledge if it is sufficiently secured against competitors that illegally copy the products of its innovation. Intellectual property rights (IPR) are the principal means to provide such security. The current system of IPR protection nevertheless confronts the industry with several important challenges.

¹ The industry which is the subject of this report is in essence composed of the shipbuilding industry on the one hand and the marine equipment industry on the other hand. For the sake of brevity, this report generally refers to the shipbuilding industry without distinguishing between these two components, except when explicitly indicated otherwise. Understood in a wider sense, the shipbuilding industry also includes a variety of service and knowledge providers. Attention will be paid to this latter group where appropriate.

1.2. Problem description

It is generally felt that the European shipbuilding sector is confronted with new technologies being copied rapidly by its competitors. Many fear that the leakage of knowledge will lead to the disappearance of the European competitive advantage and will impede European companies to recover their investments in innovation. The leakage of knowledge has a negative effect in the short run, because European shipbuilders and equipment suppliers will lose turnover and market share. Knowledge leakage also has a negative impact in the longer run, because it functions as a disincentive for future innovation efforts of the sector. Thus the leading position of the European shipbuilding industry, and the economic well-being of the EU more generally (loss of competitiveness, loss of employment), could ultimately be negatively affected.

Though technological leakage is by no means confined to the shipbuilding industry, it is particularly sensitive and threatening for that industry due to its specific history and the position it currently has on the global market. It is generally acknowledged that innovation is a key for European producers to stay ahead of competition, having regard to (especially) the relatively low labour costs and other advantages that often benefit its competitors in the emerging countries.

The evidence on the scope and seriousness of these challenges has been largely anecdotal up to now. Little was known, for example, about the precise attitudes and practices of European shipbuilders with regard to the protection and enforcement of their intellectual property rights. The truly global nature of this problem poses an additional challenge in this regard. Although there are clear signals that technological leakages can have substantial adverse consequences in specific cases, it is to date largely an open question what the actual or potential consequences of such leakages are in economic terms.

1.3. Aim of the study

This study aims at gathering further insights into the challenges and possibilities of IPR protection and the economic value of infringements on IPR in the European shipbuilding industry. The aim is to investigate what the actual size and scope of the IPR infringements is, and to assess to what extent the current system of IPR protection can be considered sufficient.

Against this background, the report will address a number of questions:

- What is intellectual property from a legal point of view?
- To what extent does this match with the sector's view on innovativeness?
- Which examples of IPR infringement can be given?
- How wide-spread is the infringement problem and what is the sense-of-urgency?
- What does this mean in economic terms?
- What can be done to overcome the problems?
- Does this require changes in the legal framework?
- To what extent could the current evolutions in the innovation landscape (open innovation) be captured in the policy framework?

Based on the in-depth understanding obtained in answering these questions, the ultimate goal of this study is to recommend practical ways to further improve the policy currently in place, in order to tackle the challenges the European shipbuilding industry is confronted with to the highest possible extent.

1.4. Approach

In light of the nature of the problem, Houthoff Buruma and Policy Research Corporation have analysed the problem both from a legal and from an economic point of view, while having given much attention to the interaction between the legal and the economic considerations in order to sketch a complete, coherent and realistic picture.

Relatively little factual information on the issues under consideration is available. Therefore, a pragmatic approach has been followed, in which desk and field research were combined to gather the necessary information for pinpointing the essence of the various issues at stake and to subsequently suggest ways to address these.

As part of the field research, around 80 shipyards and marine equipment suppliers have been approached by means of a questionnaire.² These companies have been selected on the basis of CESA and EMEC membership lists; the comprehensiveness of this selection has been discussed with several key players.³ The rate of response to the questionnaires was roughly 40%. To complement the picture that emerged, further interviews have been held by phone as well as in person with representatives of both individual companies and umbrella organisations.⁴ This field research was primarily focused on gathering information about the protection policy of the respondents and their experiences with IPR infringements to date.

Further research has been done into the use of patents by the selected shipyards and marine equipment suppliers, making use of the objective information available through the Espacenet database.⁵ The outcomes of this database study have also been discussed with stakeholders in order to guarantee a correct understanding thereof.

Furthermore, the current legal instruments and mechanisms of IPR protection that are (potentially) of relevance in this context were mapped through studying the available literature and case-law. Based on, *inter alia*, the main elements of a ship and interviews with stakeholders, an inventory was made of the practical and theoretical availability of the various instruments. In order to guarantee that the sketch of the legal situation in the Far East is up-to-date and realistic, external Chinese and South Korean legal experts

² The questionnaire is attached as *Annex I*. The questionnaire was initially sent out in April 2007. In cooperation with CESA, the questionnaire has also been distributed through the national CESA member societies in May 2007, in order to broaden the basis for analysis and complement the preliminary results.

³ See *Annex II* for an alphabetic and relatively comprehensive overview of the major European shipyards and marine equipment suppliers, from which the questioned market players has been selected. The membership lists of CESA and EMEC contain roughly 290 and 1250 members respectively. Though largely addressing the same questions, the scope of the survey conducted within the framework of the present study is somewhat broader than the CESA survey on IPR carried out in 2005. The present survey is better suited to yield a sample of quantitative data from both shipyards and marine equipment suppliers, also because the number of respondents provides a broader basis for analysis. Due note has been taken of the outcomes of the earlier CESA survey.

⁴ See *Annex III*.

⁵ Available at <http://www.espacenet.com>. While using this database, corrections have been made as much as possible with regard to companies that may have changed their names over the years (e.g. Aker Yards), as well as the fact that many of these companies belong to broader industrial groups that may have other, non-marine related patents.

have been consulted.⁶ In the report, the emphasis is not so much on describing the legal systems of countries such as China and South Korea, but rather on the actual functioning and practical shortcomings of those systems.

As to the economic aspects, use has been made of earlier work done by Policy Research Corporation in this field. Wherever possible and necessary, the available data have been updated and tailored to the specific issues at stake in the present study. Added with field research and further desk study, the economic value and mechanisms of the European shipbuilding and equipment industry have been determined. Based on the available data, an estimate has been made of the economic value of the infringements.

1.5. Outline of the report

Below the relevant legal framework will first be set out (chapter 2), outlining the 'classical' instruments of IPR protection. Furthermore, an overview will be given of some of the other possible methods of protecting innovations, in particular the use of contract clauses and the law of unfair competition. The relevant EC and International framework for protection will also be sketched here.

Chapter 3 focuses on the protection of IPR in the shipbuilding industry in practice. Firstly, the burdens to protection that the industry experiences in practice will be discussed, with specific emphasis on the question of enforceability. Besides a discussion of the burdens of a more general nature, attention is paid to the burdens that are specific to enforcement in the Far East. Then some guidelines will be given as to how intellectual property can be protected most effectively.

Chapter 4 looks into the role of knowledge, innovation and IPR in the European shipbuilding industry. After an analysis of the functioning of these concepts in this particular context, the outcomes of the field and database research will be discussed, giving an insight into how the industry views these issues in practice. Finally, the concept of 'open innovation' will be introduced.

⁶ Input on the Chinese system of IPR protection was provided for by Jun He Law Offices (Beijing), which is part of the global Lex Mundi network of independent law firms of which Houthoff Buruma also is a member. For South Korea, this role was fulfilled by the firm Kim & Yang from Seoul. Information on the legal system and the enforcement issues China and South Korea has also been obtained from other sources. For practical reasons, this study was limited to China and South Korea, as these are the countries that are generally of most importance to the European shipbuilding industry in this context.

The following two chapters are dedicated to the economic component of this study. Chapter 5 first sketches the broad economic structure and importance of the shipbuilding industry, using key indicators such as turnover, value added and employment. Based on this foundation, chapter 6 looks into the scope and size of knowledge vehicles, broadly estimating the economic value at stake.

Chapter 7 deals with various issues. Some particular issues related to competition law are addressed, and a comparison is drawn with other relevant sectors of economic activity. The last part of the chapter is dedicated to health, safety and environmental issues that can be a result of counterfeit and piracy.

Finally, chapter 8 contains the conclusions of this study as well as the policy recommendations that are suggested on the basis of the foregoing.

Throughout this report, various real-life problems and challenges experienced by the industry are illustrated by brief case studies.⁷

⁷ Please note that these cases concern a representation of the facts as presented by the company or companies involved and do not necessarily represent the opinion of the authors of this report.

2. Legal framework

This chapter sets out the relevant legal framework. Firstly, an overview is given of both the 'classical' instruments of IPR protection and other methods of protecting knowledge and innovations. Then the relevant EC and international framework for IPR protection will be sketched.

2.1. Classic IPR Protection

2.1.1. Common instruments

Intellectual property rights can be defined as rights granted to creators and owners of works that are results of human intellectual creativity. IPR protection forms an incentive for creativity and innovation by guaranteeing exclusivity for a certain time period. IP law strikes a balance between the (intellectual) right of a creator/owner and the general interest by putting in place time-limits on the right of exclusive protection. During a period of exclusivity, costs of creation/innovation can be recovered by the creator, which is thought to have a positive effect on innovation. Classic IP protection is based on the idea that, without a mechanism to give the creator the possibility to get a reasonable return on investment,⁸ companies will often not be willing to invest in innovation.

From a legal point of view, not every use of technological knowledge by a third party constitutes an IP infringement. It is important to distinguish between:

- knowledge that *can* be protected through the use of IP law instruments on the one hand and knowledge that *cannot* be protected because it does not fulfil the criteria for IPR protection (e.g. patent protection can only be obtained if an invention is truly new) on the other hand;
- knowledge that is *in theory* 'protectable', but is not protected *in practice* (e.g. because the creator is not aware of the possibilities of protection, or because the creator deliberately chooses not to protect its knowledge given the costs of registration, expected enforceability problems, etc.).

⁸ Although there is little empirical evidence, it is thought that high levels of counterfeit and piracy can affect innovation negatively, because they affect the return of the rights holder:

- the presence of counterfeit products will have a downward influence on prices;
- counterfeited or pirated products may damage the image and reputation of firms over time;
- IP holders do not receive royalty payments that they would otherwise be entitled to;
- IP holders will incur costs in combating counterfeit and piracy.

See the OECD-report 'The Economic Impact of Counterfeit and Piracy', p. 18.

It follows from the case-law that IP litigation in the shipbuilding industry is not always successful, because the plaintiff has not protected its IP adequately and has to (try to) resort to unregistered copyright or design law or the law of unfair competition. Although such claims can be successful,⁹ the plaintiff would sometimes have been better off with a (timely) registered IP right.

The protection of hulls

In a case that was decided by the District Court of Amsterdam on 19 June 1997 the plaintiff argued that the defendant infringed on their copyright and/or design right by copying the hull of their fast planing vessel the “Offshore Commander”. The Court was of the opinion that copyright law did not provide protection for the hull of the ship, because the shape served a purely functional purpose.¹⁰ A similar decision was taken by the Court of Rotterdam on 30 December 1999 with respect to the so-called Muscari hull.¹¹ Because the parties had – in earlier negotiations – attached great importance to the weight of the hull (which was much lower than usual), the Court was of the opinion that the shape of the hull was primarily determined by technical aspects, which led the Court to the conclusion that copyright was not available for the hull. On appeal, design protection for the Muscari hull was refused because the design was not “new” at the time of filing on 17 April 1998, since a (very similar) hull had already been in use in 1993/1994.¹²

It is very difficult to provide general rules as to which innovation can or should be protected by what type of IPR instrument. For example, one cannot say that manuals are, as a general rule, protected by copyright. The extent to which a product is protectable depends very much on whether the content of the manual has an own character and a personal mark of the creator, which can only be established on a case-by-case basis. The same applies to the protection of calculations, drawings, documentation, etc. *Table 2.1* below provides an overview of the objective criteria for the different categories of IP protection.

⁹ See e.g. District Court of The Hague 8 December 1994, BIE 1996, 42 (*De Breedendam/Makma*), where the President of the Court held that the used combination of clinker-built upper ship was unique and protected by copyright. The defendant was therefore not allowed to exhibit the motor sloop “Makma E 173” on the HISWA-exhibition in Amsterdam in 1994.

¹⁰ See District Court of Amsterdam 19 June 1997, BIE 1998, 74 (*Mandemaker/Cygnus Marine*).

¹¹ See District Court of Rotterdam 30 December 1999, BIE 2001, 80 (*Van Dijke/Dutch Marine Associates*).

¹² Court of Appeal of The Hague 27 December 2001, *Van Dijke/Dutch Marine Associates*, not published.

Table 2.1: Schematic overview of the legal protection instruments¹³

IPR types	Characteristics	Requirements	Remarks
Patent	Exclusive right Publication For certain time (EU max 20y) and certain countries Licensing	Novelty Inventive step Industrial application	EPC (European Patent Convention) gives directly right to a patent, EPO (European Patent Office) converts the patent in national patents Provisional examination PCT (Patent Cooperation Treaty)
Trademark	Unitary character Exclusive right Essential function Right of priority Unlimited renewable (periods of 10y) publication Licensing Exhaustion of rights	Marks: Word, Figurative marks (in colour or not), Colours (also combination), Three-dimensional marks, Shape of goods or packaging, Sound marks Certain ground of refusal (absolute and relative)	Exclusion of registrability: Shape resulting from nature of goods Shape necessary to obtain a technical result Shape giving substantial value Examination ex parte by OHIM (Office for Harmonisation in the Internal Market)
Design right	Registered Exclusive right Renewable (EU max 25y) Unregistered Right to act restricted to copying (EU 3y) To identify the shape of a product Exhaustion of rights Licensing	Novelty An individual character	Applicable to the appearance of the whole or a part of a product Exclusion of protection: the technical aspects of a design CDR (Community Design Rights) does not apply to component parts not visible once incorporated into complex products & spare parts and does not require detailed examination Design Directive does not fully harmonise the law applicable to designs, as it expressly states that these legislative acts do not affect the applicability of other laws to industrial designs. WIPO: International Designs Treaty
Copyright	Exclusive right Right to claim authorship of the works and to object against any distortion, mutilation, modification, etc Continuous via	A production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression Author's own intellectual creation	Protection through the whole world

¹³ Protection on the basis of the law of unfair competition and/or contract clauses is this table, but does not qualify as classic IPR protection. These protection mechanisms will be described further in section 2.2 below.

IPR types	Characteristics	Requirements	Remarks
	successors Presumption of authorship Licensing	Expression of a computer program in any form	
Licensing	Exclusive agreement on right to use a patent	Contains agreement on production and sales, infringement consequences, royalties	No obligation to register the licence in the public Patent Registry (recommended)
Unfair competition	Any act of competition contrary to honest industrial or commercial practice Complementary character	Acts to create confusion towards a competitor False assertions Indications of allegations	
Contractual law	No exclusive right Protection only among agreed parties Freedom of contract Penalty clause	Infringements of the provision of the contract Validity of the provision	Hard to enforce when business relations have to be preserved

Several types of IP protection (patent, trademark, copyright, industrial design or trade secret) can be appropriate for one product. Although a functional product is traditionally best protected by a patent, the product may contain various forms of intellectual property, each capable of independent protection. By seeking different forms of IP protection for various aspects of a product, it may be possible to create layers of IP protection around the product that are much more effective in hindering competitor duplication than a single form of IP protection.¹⁴ To give a concrete example: patent protection could be available for the functional features of a new steering mechanism, while at the same time its brand name could be protected under trademark law, the method of manufacture by trade secret and the shape of the device by industrial design.

¹⁴ See Smart & Biggar/Fetherstonhaugh, 'Layers of IP protection', *International Law Office* of 8 October 2007.

2.1.2. Utility models

The utility model is – just like a patent – an exclusive right granted for an invention, which allows the right holder to prevent others from commercially using the protected invention, without his authorisation, for a limited period of time. The main differences between utility models and patents are the following:¹⁵

- The requirements for acquiring a utility model are less stringent than for patents. While the requirement of "*novelty*" always has to be met, that of "*inventive step*" or "*non-obviousness*" may be much lower or absent altogether. In practice, protection for utility models is often sought for innovations of a rather incremental character which may not meet the patentability criteria.
- The term of protection for utility models is shorter than for patents and varies from country to country (usually between 7 and 10 years without the possibility of extension or renewal).
- In most countries where utility model protection is available, patent offices do not examine applications as to substance prior to registration. This means that the registration process is often faster.
- Utility models are generally cheaper to obtain and to maintain than patents.
- In some countries, utility model protection can only be obtained for certain fields of technology and only for products but not for processes.

In short, even though the scope of the protection is more limited for utility models than for patents, protection through utility models is generally easier and cheaper to obtain. Especially for small and medium-sized enterprises this can prove a useful additional instrument of IP protection. However, the utility model is a concept that does not exist in all Member States.¹⁶ The European Commission proposed a Directive with respect to utility models, but this proposal has been withdrawn in 2005 in view of the lack of progress towards its adoption.¹⁷ This might (partly) be due to the fact that utility model protection systems still differ widely between Member States.¹⁸

¹⁵ See: http://www.wipo.int/sme/en/ip_business/utility_models/utility_models.htm.

¹⁶ The utility model does not exist in the United Kingdom, Sweden and Luxembourg (see http://ec.europa.eu/internal_market/indprop/docs/model/consultation_en.pdf). Although the Netherlands has a 'short term patent' (protection for the duration of 6 years), it has recently decided to abolish that instrument. In countries where the national legislation does not provide for utility model protection, SMEs may either apply for a patent or keep the invention as a trade secret.

¹⁷ See 1997/0356/COD.

¹⁸ See Commission Green Paper of 19 July 1995 on the Protection of Utility Models in the Single Market, COM(1995) 370 final.

2.2. Alternative means of IPR protection

2.2.1. Contract clauses

In addition to the use of the 'classical' instruments of IPR protection, contractual clauses regarding protection of IPR can be used in contracts with employees, customers, designers, classification societies and other relevant parties, in order to protect sensitive technological information. Some market players have indicated not to apply for patent protection, because that entails publishing their invention, while they prefer to keep the information to themselves (by imposing contractual non-disclosure obligations) in order to prevent other companies from copying or elaborating on their invention.

Examples of contract clauses are:

- *Confidentiality obligations* (trade secret) – technological information can be contractually protected as confidential information;
- *Non-compete clauses* – it is quite common to include post-termination non-competition clauses in employment contracts;¹⁹
- *Licensing agreements* – the agreement that another person or company can make use of your protected knowledge against payment of royalties.

It is important to note that a trade secret – the most important type of contract clauses in this connection – is no property and does not protect the inventor against third parties' independent discovery or legal acquisition of the information, for example by accidental revealing or reverse engineering.²⁰ Contracts merely lay down mutual rights and obligations between the parties to a contract. Apart from exceptional circumstances, third parties are not bound by the contract. In practice this lack of *erga omnes* action may prove to be an important disadvantage.

An additional disadvantage of protection through contractual clauses is that – especially to parties that have business relations involving the exchange of sensitive information with a great number of other parties – it may in practice take considerable time and energy to negotiate individual contracts, which should be drafted in a precise manner to avoid interpretation disputes. Furthermore, market players are sometimes reluctant to

¹⁹ To be compliant with competition law, those clauses should be limited to a reasonable geographic area and time limit.

²⁰ See A. Pianon, 'Trade Secret vs. Open Source', ELER 2004, p. 54.

enforce contracts, because they fear that business relations will be harmed.²¹ In this connection one should also note that concluding a contract outlining non-disclosure obligations presupposes willingness to subscribe to such obligations on both sides, as well as a more or less balanced bargaining position between the parties concerned. This may in practice not always be the case, especially when small and medium-sized enterprises are confronted with larger, more powerful counterparts.

Hesitations about biting the hand that feeds you (2002)

A southern European yard experienced a serious consequence of leakage. A respected and crucial client of the yard ordered several cruise vessels at a Japanese shipyard. They made copies of a cruise vessel previously developed and built by the European yard. Afraid of losing the customer, the yard decided not to take any legal steps.

However, protection through contractual clauses also has advantages over classic IP protection:

- a) trade secret protection can be obtained immediately and at a relatively low cost;
- b) trade secret has a broader scope of protection: almost all useful information can be protected by trade secret, while only novel and inventive innovations can be patented. Although innovation in the shipbuilding industry might regularly rise to the (required) level of invention, it often does not and is the product of the skilled use of know-how;
- c) litigation costs are often lower. The violation of a trade secret consists of a breach of a non-disclosure obligation, which has to be proven, whereas patent litigation often requires extensive legal and technical discussions about the validity and the scope of protection of a patent, which imply higher costs of litigation and more uncertain outcomes.²²

²¹ This problem, which is often felt by SMEs in particular because of their more modest position on the market, may of course also exist when a company considers enforcing classical IPR instruments. Nevertheless, taking enforcement action will generally be more sensitive when protection is ensured through contract clauses, as this typically concerns a direct and exclusive relationship between the two parties concerned.

²² See A. Pianon, 'Trade Secret vs. Open Source', ELER 2004, p. 49-51, where an inventory of the advantages of trade secret in the software industry is provided.

2.2.2. Law of unfair competition

In most Member States, there is also (a limited) scope to act against counterfeit and piracy on the basis of the doctrine of unfair competition, which can provide a useful tool if no classic IPR protection has been obtained or if the term of IP protection has ended. In the *Beele* judgment,²³ it was confirmed by the Court of Justice of the European Community (ECJ) that there can be a role for the law of unfair competition next to the system of classic IPR protection.

The *Beele* judgment

A preliminary question was raised in the context of an action between a Dutch undertaking, the sole importer of cable ducts manufactured in Sweden which had been marketed in the Netherlands since 1963, and another Dutch undertaking which since 1978 has marketed cable ducts in the Netherlands that had been manufactured in Germany. The Swedish cable ducts were previously protected by patent rights in Germany, the Netherlands and elsewhere, and the German cable ducts were first made and imported into the Netherlands after the period of validity of those patents had expired. The German cable ducts being a precise imitation of the Swedish cable ducts, the first undertaking sought an order restraining the defendant from marketing the German cable ducts or causing them to be marketed in the Netherlands.

The Dutch court of appeal asked the ECJ whether it could order an injunction, despite the fact that the duration for patent protection had already expired. Under the Dutch doctrine of unfair competition (that is comparable with the protection against precise imitation in the laws of most other Member States), the importing company competed unlawfully by importing counterfeit products. On the other hand the Dutch court feared that the imposition of an injunction could be contrary to the free movement of goods, because the products had been lawfully marketed in Germany (Article 28-30 EC).²⁴

The ECJ considered that, although an injunction would indeed pose an obstacle to the free movement of goods between the Member States (Article 28 EC), that obstacle could be justified as being necessary in order to satisfy mandatory requirements relating to the protection of consumers and fairness in commercial transactions (Article 30 EC), because the injunction could prevent confusion between the two products.

²³ ECJ 2 March 1982, case 6/81, *BV Industrie Diensten Groep v. Beele*, ECR 1982, 707.

²⁴ See e.g. ECJ 20 February 1979, case 120/1978, *Cassis de Dijon*, Rec. 1979, 649 and ECJ 17 June 1981, case 113/80, *Commission v. Ireland*, Rec. 1981, 1625.

The *Beele* judgment forms a clear recognition of the importance that the law of unfair competition can have if companies do not have recourse to classic IP rights.²⁵ Although most Member States have rules against unfair competition, (the application of) those rules may vary between the Member States, because the law of unfair competition has not been harmonised on the European level.

2.3. The international perspective

2.3.1. EC Instruments

a. General IP Directives and Regulations²⁶

On the EU level, attention was initially focused on trademarks. The measures adopted were designed, on the one hand, to harmonise laws on national trademarks and, on the other, to establish a Community trademark. A Directive harmonising the conditions for registration of a national trademark and the rights conferred by such a mark was adopted in 1988.²⁷ A few years later, the Council adopted the Regulation on the Community trademark in 1993,²⁸ enabling holders of a Community trademark to market their products throughout the Community and to benefit from a single set of rules of protection. One single registration with the Office for Harmonisation in the Internal Market (OHIM) suffices to obtain Community-wide protection.

The approach taken towards designs is similar to the one followed for trademarks. In 1998, the European Community adopted a Directive approximating national laws to bring them into line with the rules on Community designs.²⁹ A regulation to set up a Community design was adopted in 2001 with the aim of establishing a unified system for obtaining a Community design which enjoys uniform protection in the internal market.³⁰

²⁵ Often the requirements for protection on the basis of the law of unfair competition are higher than for protection on the basis of classic IP rights, meaning that the law of unfair competition has an important – but restricted – complementary role in cases of clear counterfeit. See e.g. Dutch Court of Cassation 31 May 1991, NJ 1992, 391 (*Borsumij/Stenman*).

²⁶ See the Commission website <http://europa.eu/scadplus/leg/en/lvb/l26021.htm>.

²⁷ The Trademark Directive (89/104/EC).

²⁸ The Community Trademark Regulation ((EC) 40/94).

²⁹ The Design Directive (98/71/EC).

³⁰ The Community Design Regulation ((EC) 6/2002).

For patents, there is currently no EU system in place that is comparable to the system that has been created for trademarks and designs. However, there are two conventions in the patents field. The first, the Munich Convention on the European Patent, which was signed in 1973 by a number of Member States and non-EU countries in Europe, provides for patents to be obtained for a number of countries through a single application to the European Patent Office. All the EU Member States are now party to this Convention. The second, the Luxembourg Convention, was signed in 1975 and is intended to give unitary effect to European patents applied for in Community territory.

In 1997, the Commission adopted a Green Paper on the Community patent and the patent system in Europe,³¹ describing the situation as regards the protection of innovation by the patent system and looking at the scope for new initiatives in this field. On the basis of this Green Paper, a proposal for a Regulation was adopted in 2000, aiming to set up a Community patent which would coexist with national patent systems and with the Munich Convention system (European patent).³² By offering appropriate legal certainty and a single patent for the whole of the Community, it should allow Europe to derive full benefit from research and new knowledge. At the same time this should fulfil one of the key principles of the Internal Market by providing a patent right that is consistent across Europe.

However, it has turned out to be difficult to reach a final agreement on this dossier. So far, the Council of Ministers has been unable to agree on a compromise regarding the issue of the translation of patent claims. More recently, the Commission has, after a broad consultation, issued a Communication on enhancing the patent system in Europe outlining the Commission's vision on this topic and attempting to revitalise the debate.³³ Moreover, a separate and comprehensive Communication on IPR is planned for 2008. At the same time several (transitional) alternatives or complements to the Community patent have been created, such as the London Agreement, the European Patent Litigation Agreement (EPLA) and the Translation Protocol. These measures generally aim at reducing the costs of patent translation and litigation. Creating the possibility of filing

³¹ See COM (1997) 314 final.

³² See COM (2000) 412 final.

³³ See COM (2007) 165 final.

patent applications in just one language in all Member States of the EU and shortening the application procedure will save the European shipbuilders considerable costs and will make it more attractive to seek patent protection.³⁴

b. The combat against counterfeit and piracy

The counterfeit and piracy of goods cannot only cause harm to the European economy (the fact that no intellectual property payments are included in the purchase price may stifle future innovation and creation³⁵), but also to the health and safety of consumers and the environment. On the European level much is done to combat counterfeit and piracy:³⁶

- In 1998, the Commission presented a Green Paper on the fight against counterfeiting and piracy in the Single Market in order to launch a debate on this subject with all interested parties.³⁷ This consultation exercise confirmed that the disparities between the national systems of IPR had a harmful effect on the proper functioning of the Internal Market. The consultation exercise was, in 2000, followed by a Communication to the Green Paper proposing an action plan to improve and strengthen the fight against counterfeiting and piracy.³⁸
- The so-called Anti-Piracy Regulation³⁹ sets out measures and conditions for the customs authorities to take action against goods found to have infringed IPR.
- Among the initiatives proposed in the action plan of 2000 was the presentation of a Directive aimed at harmonising the national provisions on the means of enforcing IPR. The so-called Enforcement Directive⁴⁰ was enacted in April 2004

³⁴ In the Commission's Communication enhancing the patent system in Europe, the saving in costs is estimated. Although a European patent currently costs approximately € 12,448, those costs would amount to € 8,800 once the Translation Protocol has come into force. In the Netherlands it will shortly become possible to file patent applications in English. However, in all other Member States, apart from Luxemburg, it is required to file a patent application in the language of the respective country.

³⁵ Also see D.J. Gervais, 'The International Legal Framework of Border Measures in the Fight against Counterfeiting and Piracy', in O. Vrins & M. Schneider (eds.), *Enforcement of Intellectual Property Rights through Border Measures*, Oxford University Press, 2006.

³⁶ These instruments and mechanisms are also summarised on the website of the EU (<http://europa.eu/scadplus/leg/en/lvb/l11016.htm>).

³⁷ COM (98) 569 final.

³⁸ COM (2000) 789 final.

³⁹ Council Regulation 1383/2003/EC of 22 July 2003 concerning customs action against goods suspected of infringing certain IPR and the measures to be taken against goods found to have infringed such rights (Official Journal L 196 of 02 August 2003).

⁴⁰ Directive 2004/48/EC of the Parliament and of the Council of 29 April 2004 on measures and procedures to ensure enforcement of intellectual property rights (OJ L 157, 45 dd. 30 April 2004).

and had to be transposed into laws of the Member States in April 2006 at the latest.

- In a Communication of 11 October 2005 from the Commission to the Council, the European Parliament and the European Economic and Social Committee on customs responded to the latest trends in counterfeiting and piracy and presented a range of initiatives aimed at cracking down on counterfeiting and piracy.⁴¹
- In March 2006, the Council adopted a Resolution on a customs response to latest trends in counterfeiting and piracy.⁴²
- Another recent development is the Commission proposal for a Directive on Criminal Measures Aimed at Ensuring the Enforcement of Intellectual Property. This proposal was amended on 27 April 2006.⁴³ The Commission has proposed a Directive on Criminal Measures Aimed at Ensuring the Enforcement of Intellectual Property and strengthening criminal measures to combat counterfeiting.⁴⁴ These measures are aimed at approximating the Member States' criminal legislation on combating infringements of intellectual property rights. The Commission proposes that a minimum level of criminal penalties be laid down.⁴⁵ A report on the proposed Directive on criminal measures has now been adopted by the European Parliament and has been forwarded to the Council.⁴⁶

⁴¹ COM(2005) 479 fin.

⁴² Council Resolution 2006/C 67/01 of 13 March 2006 on a customs response to latest trends in counterfeiting and piracy (Official Journal C 67 of 18.03.2006).

⁴³ See Council doc. no. 8866/06.

⁴⁴ See COM (2005) 276 final, "*Proposal for a European Parliament and Council Directive on criminal measures aimed at ensuring the enforcement of intellectual property rights*" and "*Proposal for a Council Framework Decision to strengthen the criminal law framework to combat intellectual property offences*". This is in line with Article 61 TRIPs which obliges Members to "(...) *provide for criminal procedures and penalties to be applied at least in cases of wilful trademark counterfeiting or copyright piracy on a commercial scale. (...)*".

⁴⁵ At least four years' imprisonment where the offence is committed under the aegis of a criminal organisation or where the offence carries a serious risk to personal health or safety and a fine of at least EUR 100,000, or EUR 300,000 where there is a link to a criminal organisation or a risk to personal health or safety.

⁴⁶ The Commission's initial proposal of the Enforcement Directive already contained provisions on criminal sanctions against fraudsters, but those provisions were removed due to their political sensitiveness. The Enforcement Directive now merely stipulates that the Member States are free to apply other sanctions, which go further than the provisions set out, to prosecute offenders (see Article 16 Enforcement Directive).

2.3.2. International instruments

Having regard to the global context in which the problems in the shipbuilding industry occur, it is of particular relevance that the international framework for protection is set out.

The Paris Convention for the Protection of Industrial Property (1883) introduced minimum standards for the protection of IPR at an international level. The protection of intellectual property is now governed by more international treaties and conventions, which are implemented by two main organisations, (a) the World Intellectual Property Organisation (WIPO) which administers 23 treaties⁴⁷ and has 183 Member States⁴⁸ and (b) the World Trade Organisation (WTO).

a. World Intellectual Property Organisation (WIPO)

The WIPO is a specialised agency of the United Nations (UN) that promotes creative intellectual activity and facilitates the transfer of technology related to the industrial property to the developing countries in order to accelerate economic, social and cultural development. WIPO is responsible for taking action in accordance with its basic instruments, treaties and agreements administered by it. WIPO is increasingly involved in helping developing countries, to receive full benefits from the creations of their citizens, assisting them in the enforcement of laws, in the establishment of sound institutions, and administrative structures, and in the training of the appropriate personnel. The WIPO also assists developing countries in the implementation of WTO's TRIPs Agreement.

An important treaty that is administered by WIPO is the Patent Cooperation Treaty (PCT) that has seen its popularity rise in recent years. The PCT was signed in 1970 and now has 133 countries as signatories. It allows inventors to apply for a patent via their national patent office, where they can also choose for protection in the other contracting states (without filing applications in all countries). The procedure starts by filing an international application at a national or regional Patent Office (in Europe, e.g. the European Patent Office EPO) or the International Bureau of WIPO. The international application will normally only be made public 18 months after the priority date. From that moment onwards the invention enjoys the same provisional protection in national countries as it would after national filings and publications. After the international phase, the applicant has to start the national phase by fulfilling certain additional requirements (inter alia payment of national fees, the provision of translation etc.) within 30 months from the

⁴⁷ See <http://www.wipo.int/treaties/en/>.

⁴⁸ See <http://www.wipo.int/members/en/>.

priority date.⁴⁹ The international route allows the applicant to delay entering the national phase by up to 30 months from the priority date. As opposed to the otherwise applicable priority period of 12 months from the filing to take a decision regarding the extension of an application to further countries, the applicant thus gains an extra 18 months.⁵⁰

The European Community recently also joined the International Designs Treaty that is administered by the WIPO.⁵¹ That accession will allow EU companies – through a single international application – to obtain protection of a design not only throughout the EU with the Community Design, but also in the countries that are members of the Geneva Act. This system, that will simplify procedures, reduces the costs for international protection and make administration easier, will become operational for businesses on 1 January 2008.⁵²

b. Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs)

IP law is increasingly harmonised through the effects of international treaties such as the 1994 WTO-Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs).⁵³ The TRIPs Agreement sets internationally recognised minimum standards for the protection of IPR for incorporation into national laws.⁵⁴ The TRIPs Agreement deals with different aspects of the protection and enforcement of IPR. Members are under an obligation to ensure that they have enforcement procedures which enable rights holders to take “*effective action*” against the infringement of any IPR covered by the Agreement. This requires the availability of both preventive and deterrent remedies. Civil procedure and remedies should be available to cover all forms of IPR infringement and Members are required to implement border controls and criminal procedures in respect of trademark counterfeiting and piracy.

The TRIPs Agreement explicitly recognises that the protection of intellectual property can contribute to technical innovation and the transfer of technology.⁵⁵ The Agreement also requires the substantive obligations of the main conventions of WIPO, the Paris

⁴⁹ Also see Economist Intelligence Unit, ‘The value of knowledge – European firms and the intellectual property challenge’, 2007, p. 11.

⁵⁰ Also see www.ipr-helpdesk.org.

⁵¹ The Geneva Act of the Hague Agreement concerning the international registration of industrial designs.

⁵² See RAPID press releases of 25 September 2007, IP/07/1388.

⁵³ The TRIPs Agreement came into effect on 1 January 1995.

⁵⁴ The Agreement establishes minimum standards governing copyrighted literary, artistic works, rights related to copyright law, patents, trademarks, geographical indication et cetera (Articles 9-39 TRIPs).

⁵⁵ Article 65 TRIPs.

Convention and the Berne Convention in their most recent versions, to be complied with. With the exception of the provisions of the Berne Convention on moral rights, the main substantive provisions of these conventions are incorporated by reference and have thus become obligations under the TRIPs Agreement between WTO Member countries.⁵⁶

Non-discrimination is a basic principle of TRIPs and consists of two components: “*national treatment*”⁵⁷ and “*most-favoured-nation treatment*”.⁵⁸ By virtue of the *national treatment*, each WTO member should treat the nationals of every other WTO member at least as favourably as its own with regard to IP protection.⁵⁹ The *most-favoured-nation treatment* requires WTO members, if they grant any advantage, favour, privilege or immunity with regard to IP to the nationals of another country, to immediately and unconditionally grant it to all other WTO members.⁶⁰

A dispute settlement mechanism has been developed to control the implementation of the provisions in the TRIPs Agreements and resolve any government to government disputes regarding the interpretation of those provisions. It should be noted that TRIPs only sets minimum standards for IPR protection and enforcement, which leaves the way open for bilateral or regional agreements that go further than TRIPs.

c. Bilateral and regional agreements

In addition to treaties such as the Paris Convention and the TRIPs Agreement, many regional and bilateral agreements contain provisions on IPR, which sometimes go beyond the minimum level that is required by TRIPs.

⁵⁶ See <http://www.wto.org>.

⁵⁷ Article 3 TRIPs.

⁵⁸ Article 4 TRIPs.

⁵⁹ TRIPs preserves some exceptions to that principle (Article 3 (1) TRIPs), but Article 3 (2) TRIPs limits the availability of the exceptions in relation to judicial and administrative procedures, only where such exceptions are necessary to secure compliance with laws and regulations which are not inconsistent with the provisions of TRIPs and where such practices are not applied in a manner which constitute a disguised restriction on trade.

⁶⁰ Article 4 TRIPs contains a number of exceptions to that rule: favours which derive from international agreements on judicial assistance or law enforcement of a general nature; granted in accordance with provisions of the Berne or the Rome Convention authorising that the treatment accorded be a function not of national treatment but of the treatment accorded in another country; in respect of the rights of performers, producers of phonograms and broadcasting organizations not provided under TRIPs; deriving from international agreement related to protection of IP which entered into force prior to the entry into force of the WTO Agreement, provided that such agreements are notified to the Council for TRIPs, and do not constitute arbitrary or unjustifiable discrimination against nationals of other WTO members.

d. Non-governmental action

Also at the business level, a lot is done to combat counterfeit and piracy. BASCAP (Business Action to Stop Counterfeiting and Piracy) of the International Chamber of Commerce (ICC), for example, unites the global business community to effectively address intellectual property right issues and petition for greater commitments by local, national and international officials in the enforcement and protection of intellectual property rights. The goals of BASCAP are to increase public and political awareness and understanding of counterfeiting and piracy activities and the associated economic and social harm, to compel government action and the allocation of resources towards improved IPR enforcement and to create a culture change where intellectual property is respected and protected.

2.3.3. IPR protection in the Far East

A comprehensive overview of the legal systems to protect IPR in China and South Korea is attached to this report as *Annex IV*. This overview indicates that this system is, in both countries, on the whole rather complete and up-to-date. As will become clear in the remainder of this study, the shortcomings and problems that do exist in this regard relate primarily to the working of this system in practice. In short, on paper an adequate level of protection is granted in China and South Korea, but those countries are still lagging behind when it comes to the enforcement of IPR in practice.

China has been a member of various international IPR protection agreements, treaties and organisations for many years. The country joined the World Intellectual Property Organisation (WIPO) in 1980 and acceded to the Paris Convention for the Protection of Industrial Property in 1985. China entered the World Trade Organisation (WTO) in 2001. Since the early 1980s, China has a patent law and a trademark law in place, which have been regularly updated since. Furthermore, China has a copyright law and a law against unfair competition.

South Korea is also a member of various international IPR protection agreements, treaties and organisations, including the WIPO (1979), the Paris Convention (1980), the Patent Cooperation Treaty (1984), the Universal Copyright Convention (1987), the Berne Convention (1996), the Trademark Law Treaty (2003) and the WIPO Copyright Treaty (2004). In 1995, South Korea entered the WTO. Korea's national legislation includes laws to protect patents, utility models, designs, copyrights, trademarks and trade secrets as well as a law against unfair competition. Many of these laws date from the 1960s and have been updated since.

3. IP protection in the shipbuilding industry: burdens and possibilities

This chapter discusses the functioning of intellectual property mechanisms in practice in relation to the European shipbuilding industry. The first section of the chapter expands on the most important general burdens to effective protection, while the following section looks into (potential) burdens that are specific to IPR enforcement in the Far East (in particular China). Finally the question of how stakeholders could use the current system of IP protection more effectively will be addressed.

3.1. General burdens to protection

3.1.1. Proof of evidence

An important burden in IP litigation is the general rule that the plaintiff has to supply proof of the IP infringement. In some cases that proof is difficult to furnish. This is especially the case for complicated patent cases, where the other party often contests the validity of the patent (on the basis that it is not new or inventive).⁶¹ It usually requires a detailed technical expert report to demonstrate that. A positive aspect of the Chinese Patent Law is that it already regards the copying of a patent number as a patent infringement, because it misleads the public about the technology used.⁶² However, we will set out below that the proof of evidence also forms an important burden to enforcement in China.⁶³

3.1.2. Costs of IP protection and litigation

An often-heard complaint is that the costs of protection and litigation are so high that companies (in particular, but not exclusively, SMEs), for that reason, choose not to protect their knowledge. Obviously, the costs of obtaining adequate protection depend on the instrument and the legal system concerned.

Generally speaking, the costs for patent filings range between € 2,000 and € 7,000 per country. Although the Munich Convention on the European Patent provides for central filing at the European Patent Office in Munich, that does not change the fact that fees

⁶¹ See e.g. District Court The Hague 25 July 2007, *Nexans Norway A.S. v. Aker Kvaerner*, HA ZA 06-3850 (published on www.boek9.nl, B9 4438), where the Court required a further explanation about the inventiveness of some of the conclusions of Aker's patent with respect to a construction for the manufacturing and unrolling of a connection cable.

⁶² See S.A.L. Josaputra, '*Recht over de grenzen: de strijd tegen namaak in China*', AA 2006, p. 871.

⁶³ See section 3.2.5.

have to be paid according to the number of patents and that the conclusions will have to be translated into the languages of the other countries. A European patent filing costs approximately € 4.500 per country (with a discount that increases according to the number of countries in which protection is applied for) and translation costs easily amount to € 1.500 and € 2.500 per country.⁶⁴

Costs of patent protection

To give a concrete indication of the costs involved in patent protection, a Dutch patent application costs between € 90 and € 884, the amount being largely dependant on whether one also applied for an investigation into the state of the art. Only if such an investigation has been carried out, the patent can be valid for the period of 20 years. If a company calls in a specialised patent attorney, the costs vary between € 3,500 and € 5,000. After the registration of a patent, a company has to start paying a special fee for registration from the fourth year onwards (the annual costs increase progressively from € 242 in the fifth year to € 1,106 in the twentieth year).⁶⁵ In principle, similar costs will have to be paid in all other countries where a company wants to enjoy patent protection.

In order to ensure the protection obtained in practice, the protection may have to be enforced through litigation. The costs of litigation do not only entail legal costs – which can especially be very high in complicated IP cases – but also the costs of investigation and the collection of evidence to be able to prove that an IP infringement has occurred and to prove which damages have been suffered (to prove that often (economic) experts have to be involved in the case). Although the European Enforcement Directive prescribes that Member States shall ensure that reasonable and proportionate legal costs and other expenses incurred by the successful party shall, as a general rule, be borne by the unsuccessful party,⁶⁶ the fact that the outcome may be unsure can already be enough reason not to litigate a case. In non-EU countries, it is not always possible to receive payment of the incurred legal (and other) costs by the infringing party,⁶⁷ which makes litigation even less attractive.

⁶⁴ See the website of the Dutch Patent Centre, www.octrooicentrum.nl. See on the costs of IPR protection also the Commission's Communication enhancing the patent system in Europe, COM(2007) 165.

⁶⁵ If the annual fee is not paid, the patent expires.

⁶⁶ See Article 13-14 Enforcement Directive (2004/48/EC). The downside of Article 14 is that the plaintiff does not only risk spending a significant amount of money on the preparation of the case, but also that - if the case is lost – he will have to pay all costs the defendant incurred.

⁶⁷ In section 3.2.7 it will be set out that this is the case for China, for example.

Disincentives to protect (recent)

A European marine equipment supplier owns a patent on the central locking mechanism that enables a quick handle action of the watertight door. In the past three years several copies have been made by Asian suppliers. The European supplier gathered information on the copies and handed this over to the patent office to verify their rights. The patent office could determine that the copies are look-a-likes (but not 100% identical), while indicating that it will be very difficult – and expensive – to win such a case in court in the Asian country concerned. The patent office merely warned the infringers that there is a patent on the product. Recently, the European supplier has decided not to continue the patent on this product, because of the enforcement problems and the high costs of litigation, on top of costs to maintain the patent filing.

3.1.3. Article 5ter of the Paris Convention

Article 5ter of the Paris Convention for the Protection of Industrial Property (Paris Convention) also forms a burden to enforcement. This provision – that has existed since 1925 and was based on earlier case-law⁶⁸ – limits the right of patent owners in the event that a ship enters a country temporarily under the flag of a foreign nation:

“Patents: Patented Devices Forming Part of Vessels, Aircraft, or Land Vehicles

In any country of the Union the following shall not be considered as infringements of the rights of a patentee:

(i) the use on board vessels of other countries of the Union of devices forming the subject of his patent in the body of the vessel, in the machinery, tackle, gear and other accessories, when such vessels temporarily or accidentally enter the waters of the said

⁶⁸ 1851, *Caldwell v. Van Vlissingen*, referred to by D. Stauder, ‘Die Freiheit des internationalen Verkehrs im Patentrecht – Schiffschraube, Gaffelklaue und Sonnenpaddel’, GRUR 1993, 306. In that case an English patent holder claimed that a Dutch company infringed on its patent rights by using a certain ship propeller for its vessels “*Burgemeester Huidekoper*”, “*Stad Dordrecht*” and “*Feyenoord*”. However, those vessels were produced lawfully in the Netherlands. The judge acknowledged the danger for the international trade if he would allow an injunction on the basis of English patent law, but considered this to be a problem for the legislator. In 1857, the Supreme Court of the US decided differently in a comparable matter (*Brown v. Duchesne*, also referred to in footnote 59).

country, provided that such devices are used⁶⁹ there exclusively for the needs of the vessel;

(ii) *the use of devices forming the subject of the patent in the construction or operation of aircraft or land vehicles of other countries of the Union, or of accessories of such aircraft or land vehicles, when those aircraft or land vehicles temporarily or accidentally enter the said country.*” (underlining added)⁷⁰

Article 5ter Paris Convention demonstrates a concern to leave the channels of international commerce free from the burdens that would result if vessels had to conform to the patent laws of all nations that the vessel or vehicle visits during its lifetime. Different inventions are likely to be patented in different countries, and the same invention may be patented by different parties in different countries. Article 5ter Paris Convention places foreign-owned means of transport beyond the reach of domestic patentees’ exclusive rights.⁷¹ This prevents the international traffic of goods and persons from being obstructed by seizures at the borders and other measures.

The case-law on Article 5ter of the Paris Convention (and its implementation Articles in national legislation) is not abundant. The provision seems to have been applied most frequently in the US.⁷²

- (i) United States Court of Appeal for the Federal Circuit, case 03-1256, *National Steel Car Ltd. v. Canadian Pacific Railway*⁷³

In this case National Steel Car accused Canadian Railway of having infringed its patent right on its so-called “*depressed center-beam flat car*”. Canadian Railway defended itself by relying on Section 272 entitled “*Temporary presence in the United States*” (which

⁶⁹ The provision only covers the *use* of patented devices. It does not allow the making of patented devices on board a means of transportation, nor the sale to the public of patented products or of products obtained under a patented process.

⁷⁰ In the middle of the nineteenth century, the US Supreme Court already held that the owner of a patent on an invention related to the rigging of a sailing ship had no cause of action against the master of a French schooner that voyaged between Boston and a colony of France and that embodied the invention. Given “*that the improvement in question was placed on [the ship] in a foreign port (...) and was authorised by the laws of the country to which she belonged*” (see United States Court of Appeal for the Federal Circuit, case 03-1256, *National Steel Car Ltd. v. Canadian Pacific Railway*, p. 7). The underlying reason for the decision was that infringement suits “*would (...) seriously embarrass the commerce of the country with foreign nations*” (*Brown/Duchesne*, 60 U.S. (19 How.) at 197).

⁷¹ Cf. United States Court of Appeal for the Federal Circuit, case 03-1256, *National Steel Car Ltd. v. Canadian Pacific Railway*, p. 9.

⁷² There have also been some German cases: Landgericht Hamburg 11 July 1973, GRUR 1973, 703, Rolltrailer and Hanseatisches OLG Hamburg 18 February 1988, GRUR 1988, 781.

⁷³ Published on <http://caselaw.lp.findlaw.com>.

provision was drafted to satisfy the obligations of the US under Article 5ter of the Paris Convention):

“The use of any invention in any vessel, aircraft or vehicle of any country which affords similar privileges to vessels, aircraft or vehicles of the United States, entering the United States temporarily or accidentally, shall not constitute infringement of any patent, if the invention is used exclusively for the needs of the vessel, aircraft or vehicle and is not offered for sale”.

The Court considered that the depressed center-beam flat car owned by Canadian Railway was a foreign vehicle and was therefore not disqualified from the non-infringing status created by section 272 on that basis. The Court also concluded that the vehicle entered the US “temporarily”, defining “temporarily” as entering for the purpose of completing a voyage, turning about, and continuing or commencing a new voyage with the sole purpose of engaging in international commerce.⁷⁴

(ii) Eastern District Court of New York, *Cali v. Japan Airlines*⁷⁵

In this case the Eastern District Court of New York held that the use of a patented invention in the jet engines of planes belonging to international air carriers during “*their flights to and from the United States in the course of the regular prosecution of their scheduled air services*” was within the scope of the non-infringing uses specified in Section 272. The Court was of the opinion that, even if a foreign plane comes to the US regularly, it can qualify as being in the US only “temporarily” in the sense of Section 272. Patent rights would be enforceable if an American company were to buy the plane and were to use it for domestic flights.

(iii) Court of Federal Claims, *Hughes Aircraft Co. v. United States*⁷⁶

In this case it was held that a spacecraft brought into the US for being launched into outer space prior to 1981 were outside the scope of section 272 (“*When a spacecraft is delivered to the US for the purpose of allowing the United States to launch it, the spacecraft is the cargo that is brought here for an essential use, not a “vessel” of “vehicle” which enters the US as a means of conveyance.*”).

⁷⁴ Cf. United States Court of Appeal for the Federal Circuit, case 03-1256, *National Steel Car Ltd. v. Canadian Pacific Railway*, p. 9. Not temporarily would e.g. be a Caravelle, manufactured in France and powered with such an [allegedly infringing] engine, delivered in the US for use of an airline for domestic use.

⁷⁵ *Cali v. Japan Airlines, Inc.* 380 F. Supp. 1120 (E.D.N.Y. 1974).

⁷⁶ 29 Fed. Cl. 197 (1193).

In recent years, there has also been an Article 5ter case in the United Kingdom.

Stena vs. Irish Ferries (recent)

Irish Ferries bought a vessel which was built in Australia, based on a patent of the Swedish company Stena without having obtained a license or permission from Stena. The vessel of Irish Ferries travels between Holyhead and Dublin on a daily basis. Stena had patent rights in eight European countries, including the UK but not Ireland. Stena brought the case to court in the UK.⁷⁷

Although the UK court found Stena's patent to be valid in the UK, it was of the opinion that the UK Patent Act could not govern the case because the vessel in question was only in UK waters on a temporary basis. The Court relied on the American case-law cited above and considered that – according to the UK Patent Act and the Paris Convention –, the carriage of goods and passengers between countries should not be hindered by patent rights applying to the means of transport. Another decision would interfere with international trade or the movement of people. Had Stena registered its patent in Ireland (the home country of the vessel in question), it would have been able to proceed with the case there.

Although the cited case-law mainly concerns American judgments, it is clear that the provision poses restrictions to the exclusive right of the patent holder.⁷⁸ Since ships used in the international trade area are moving all the time and never stay in one place permanently, it is not unthinkable that there are cases where ship owners can (almost) always claim to be in a country only temporarily, giving them the immunity that Article 5ter Paris Convention provides for. That, however, does not mean that the rights holder is always left empty-handed: in cases of counterfeit and piracy, he might be able to revert to other IP instruments, such as copyright, design law or the law of unfair competition. The possibilities that these other instruments could offer are not always fully exploited at present and may deserve further consideration.⁷⁹

⁷⁷ In an action on the merits. Stena did not ask for preliminary measures. Although Stena was aware of the possibilities of a seizure by customs, it did not consider asking for conservatory measures because it was afraid to bear economic consequences if it would not win the case.

⁷⁸ Also see F. van Bouwelen, 'BIG Problem with IPR for Marine Equipment – a Possible Solution', Paper to accompany presentation Split conference of 23 October 2007.

⁷⁹ See section 3.3 below.

3.2. Specific burdens to IPR protection in the Far East

In addition to the burdens of a general nature discussed above, the present section looks into (potential) burdens that are more specific to the Far East (especially China).⁸⁰ At the onset it should be pointed out, however, that IPR protection and enforcement within Europe is, of course, also not without problems (due to costs, burden of proof etc.). This said, the burdens in the Far East appear to be considerably more pressing and disproportionate in the Far Eastern countries under investigation.

3.2.1. Low commitment to respecting and enforcing IP laws

Due to the – government supported – overriding goal of rapid economic development and (particularly for China) the lack of a tradition in IP protection, there is a relatively low commitment to the protection and enforcement of IP laws (especially in less-developed areas). Another study for the European Commission also shows that China is not performing the commitments it has made within the WTO framework and that is especially lagging behind in the field of IPR protection.⁸¹ A substantial part of the problem can be attributed to a general lack of awareness of both industry and authorities in China about what is and what is not allowed. Despite the implementation of IP laws, the enforcement of those laws is now still sometimes regarded as an ‘abuse of rights by foreign companies’.

In South Korea IP enforcement is facing a similar lack of commitment, however to a lower extent. Although South Korea has considerably improved its compliance with WTO obligations, particularly in the field of copyrights there are still certain disparities with the TRIPs Agreement.

⁸⁰ Because the problems of enforceability appear to be the biggest in China, this section focuses mainly on China. However, many of the problems mentioned are, broadly speaking, similar to the problems in South Korea.

⁸¹ See also Study on the Future Opportunities and Challenges of EU-China Trade and Investment Relations, Study 12: Exploring China’s IP Environment – Strategies and Policies.

Problems of enforceability (recent)

In the marine equipment industry a North-European producer possessing a significant market share indicated to be frequently confronted with IPR infringements. Within the relevant business, the producer is almost the only one investing in development of new products and services. The infringements are mainly caused by a large Asian competitor. The copied parts are nearly the same as the original products, but it has turned out to be very hard to enforce the legal rights.

The producer has considered litigation in South Korea several times. However, the Korean Intellectual Property Office (KIPO) signalled that the chances to win the cases are very limited. The high costs and the long time legal proceedings will probably take, discourage the disadvantaged equipment supplier to bring the case to court.

3.2.2. Lack of independent judiciary

Another problem is that Chinese judges cannot act wholly independently. The Constitution promulgates that the People's Courts exercise their judicial power independently, without any interference by any administrative organ, public organisation or individual. However, in contradiction to this principle, Article 128 of the Constitution⁸² states that courts report to the corresponding level of the people's congresses that created them. At the highest level, the Standing Committee of the National People's Congress is superior to the Supreme People's Court, because it has the final word when it comes to the interpretation or invalidation of laws by the Supreme People's Court.⁸³

⁸² Article 128 Constitution states "The Supreme People's Court is responsible to the National People's Congress and its Standing Committee. Local people's courts at various levels are responsible to the organs of the state power which created them."

⁸³ See D. Friedmann, 'Paper Tiger or Roaring Dragon – China's TRIPs Implementation and Enforcement', p. 67, who points to the fact that also the People's Procuratorate Bureau exercises supervision over the judiciary, leading to the situation where procurators are subject to the authority of the court when they appear before the court as a prosecutor and yet they have the authority to challenge the "final" decisions of the court.

3.2.3. Local protectionism

In some Chinese regions, there is still a strong sense of local protectionism: it occurs that infringers do not pay their penalties, or that the infringer's goods are confiscated, but instead of being destroyed, are returned to the infringer.⁸⁴ The fact that infringing products often find their way back into the channels of commerce⁸⁵ is at odds with (the ratio of) Article 46 TRIPs, which provides that - in order to create an effective deterrent to infringement – the judicial authorities shall have the authority to order that goods that they have found to be infringing be, without compensation of any sort, disposed of outside the channels of commerce in such a manner as to avoid any harm caused to the right holder, or, unless this would be contrary to existing constitutional requirements, destroyed.

That some local courts favour local companies can be explained by the fact that local judges are appointed by the local party and financed by the local government, who in turn is dependent on the tax revenues and management fees paid by local companies. It is therefore not in the interest of the local government that the infringing company is forced to go out of business (most certainly not if the infringing company is a state company, with direct connections to the local government).⁸⁶ Despite the existence of courts that appear strongly in favour of local companies, there are other courts that have been reported to be more objective (e.g. the courts of Beijing, Shanghai, Qingdao and Gangzhou).⁸⁷

3.2.4. Lack of technical training and experience

A logical consequence of the Chinese not having a long tradition of IP protection is that some judges lack the technical training and the experience to give sound decisions, which is also made more difficult by a lack of court rules regarding evidence and expert witnesses.⁸⁸ Although Article 41 (3) TRIPs prescribes that decisions on the merits of a case should be in writing and reasoned, decisions are not always based on evidence in

⁸⁴ See D. Friedmann, *lc*, p. 32-33 and 38.

⁸⁵ Which is the rule, rather than the exception. Article 30 (1) Customs Implementation Regulation 2004 namely states that only if donating to a charitable organisation and auctioning is not possible, the infringing products shall be destroyed.

⁸⁶ See D. Friedmann, *lc*, p. 69.

⁸⁷ The differences between the courts has as a consequence that the result of litigation depends largely on the place where the plaintiff sues and where the defendant is located.

⁸⁸ Also see D. Friedmann, *lc*, p. 72.

respect of which parties were offered the opportunity to be heard.⁸⁹ This lack of transparency hampers the predictability of court judgments.

Similarly in South Korea, due to the current judicial system whereby judges rotate periodically, there often appears to be a lack of technical expertise and experience with IP cases.⁹⁰

3.2.5. Procedural requirements

Important burdens to protection in countries in the Far East are discriminatory procedural requirements (e.g. the need to notarise and legalise powers of attorney and evidence from other countries than China). Although the duration of civil cases (in particular patent cases) is generally quite long in China, it sometimes happens that cases come up for trial very quickly, which can make it difficult to adduce evidence created overseas, especially since time-limits in China are maintained quite strictly and it takes about 2 months to have evidence notarised.⁹¹

Another procedural requirement that poses a burden to protection is that the Customs Implementation Regulation⁹² imposes a deadline of three days for a right holder to apply for seizure of suspected infringing goods held by Chinese customs. If the rights holder does not take action within that limited time frame, the goods are not detained by customs. That provision is questionable in the light of Article 41 (2) TRIPs, which states that procedures concerning the enforcement of IPR shall *not* be unnecessarily complicated or costly, or *entail unreasonable time-limits* or unwarranted delays.⁹³

No serious problems have been noted regarding unbalanced procedural requirements concerning South Korea.

⁸⁹ Stanley Lubman, 'Prospects for the Rule of Law in China After Accession to the WTO,' 1999, available at <http://www.law.berkeley.edu/institutes/csls/lubmanpaper.doc>.

⁹⁰ A possible solution could be to reorganise the judicial system so as to allow judges to stay longer in the same place and position to be able to build up expertise with IP cases in the field of a certain technology.

⁹¹ See D. Friedmann, *lc*, p. 44.

⁹² See Article 21 Customs Implementation Regulation 2004.

⁹³ See D. Friedmann, *lc*, p. 39.

3.2.6. Lack of enforcement tools

Article 43 (1) TRIPs states that although the plaintiff has the responsibility to substantiate its claim, the judicial authorities should be able to order the opposing party to hand over evidence which is under their control. Although that requirement is implemented by Chinese Civil Procedure Law,⁹⁴ the workload of the courts is so excessive that the possibility to obtain evidence for the other party becomes illusory.⁹⁵ The understaffing also results in unwarranted delays.⁹⁶

The potential efficacy of customs control is seriously undermined by a lack of manpower both in China and South Korea. Although the number of infringement cases handled by Chinese customs has increased over the last years, approximately only 4% of the products leaving China are physically checked at over 300 ports.⁹⁷

Likewise many cases that meet the criminal thresholds⁹⁸ are not prosecuted,⁹⁹ because of a lack of manpower.¹⁰⁰ One could even question whether China acts in conformity with Article 61 TRIPs, which requires Members to provide for criminal procedures and penalties to be applied at least in cases of wilful trademark counterfeiting or copyright piracy on a commercial scale. The remedies available should also include imprisonment and/or monetary fines sufficient to provide a deterrent. If the criminal procedure is followed in China – which only happens scarcely – prison sentences are often not served and fees not paid, which hardly serves as a deterrent for criminal behaviour.

⁹⁴ See Article 64 Chinese Civil Procedure Law.

⁹⁵ Also see D. Friedmann, *lc*, p. 23.

⁹⁶ A patent case can, for example, take four to seven years to complete. A good example is the Chinese *Viagra*-case, where Pfizer sued a Chinese company for infringement on its patent for the pharmaceutical product *Viagra*. Despite the long duration of the case (already 6 years), the judge has not granted any injunctive relief. Since the patent already expires in 2011, that means that Pfizer will – even if it wins the case – hardly be able to obtain any return on its patent. Unwarranted delays are prohibited by Article 41 (2) TRIPs.

⁹⁷ See D. Friedmann, *lc*, p. 35.

⁹⁸ The valuation method used also has a significant influence on the question whether the case meets the criminal liabilities thresholds. See E. Papageorgiu, C. Bailey, 'Effective intellectual property enforcement in China', *BMM bulletin*, volume 113, no. 1/2007, p. 7.

⁹⁹ Less than one percent of the total trademark and copyright cases handled by administrative authorities were turned over to the PSB for prosecution in 2005. See D. Friedmann, *lc*, p. 51.

¹⁰⁰ Other reasons are a reluctance of administrative officials to transfer the case to the criminal enforcement route, because they are assessed by the number and size of successful cases or because of local protectionism.

Equally in South Korea, criminal prosecution of patent infringements is rare, mainly due to a lack of human resources and expertise.¹⁰¹

3.2.7. Low amount of damages and fines in case of infringement

Apart from the relatively high costs of litigation in China,¹⁰² foreign companies have hardly succeeded in receiving an adequate level of damages (despite the fact that the Chinese Trademark Law¹⁰³ and the Chinese Patent Law¹⁰⁴ have implemented Article 45 (1) TRIPs that requires the infringer be ordered to pay the rights holder adequate damages). In case of infringement, compensation is defined to include either an account of profits or the losses incurred by the party during the period of infringement. However, in cases where the amount of compensation is difficult to determine, the statutory damages are limited to an amount of Rmb 500,000.¹⁰⁵ If the judge also orders the destruction of the infringing products, which is to the discretion of the court, IP holders are often also required to bear the costs of destruction.

Furthermore, neither the Patent Law nor the Patent Implementing Regulations provide for award of attorney's fees to a plaintiff in a patent infringement case (which can – due to the complexity of patent cases – be very substantial). Attorney's fees are usually not awarded in China.¹⁰⁶ Another reason why China's IP laws do not guarantee that the plaintiff can recover his damages is that the infringer may have no or hidden financial resources.¹⁰⁷

The administrative enforcement route does not have a real deterrent effect either, since usually only low fines are imposed. The fines are often kept artificially low because many administrative authorities do not treat the infringing goods as having the value of the genuine articles, but rather establish value based on the price charged for the counterfeit or pirated goods. Moreover, evidence showing that a person was caught warehousing infringing goods is not sufficient to prove an intent to sell them, which means that

¹⁰¹ First, often the police has difficulty understanding the relevant technologies. Second, unless the patent infringement case is simple and very strong, prosecutors are very cautious with issuing indictments.

¹⁰² Especially the costs of investigation and bringing cases for civil litigation are relatively high, in particular the civil enforcement of patents. Court costs may also be expensive, since court filing fees are calculated as a percentage of the plaintiff's claim. See M. A. Powelson, G. Li & E.J. Kelly, 'Getting the Black Market to Knock It Off: Strategies to Enforce Trademark Rights in Asia', May 2006, p. 7.

¹⁰³ Article 56 Trademark Law.

¹⁰⁴ Article 60 Patent Law.

¹⁰⁵ Article 56 Trademark Law.

¹⁰⁶ AIPPI China Group, 'Punitive Damages as a Contentious Issue of Intellectual Property Rights', Q186, 2005, p. 2.

¹⁰⁷ See D. Friedmann, *loc. cit.* p. 23.

administrative authorities do not include those goods in the value of the infringing goods when determining the fine amounts.¹⁰⁸ Also the fines that can be imposed by customs are relatively low. The Implementing Regulations for the Imposition of Administrative Penalties by the General Administration of Customs, provide for fines not to exceed 30% of the value of the goods confiscated, or Rmb 50,000, whichever is lower.¹⁰⁹

In contrast with the relatively low fines imposed on Chinese IPR infringers, the Chinese courts have awarded high fines *against* foreign companies. One of the Chinese courts, for example, has ordered the French company Schneider Electric to pay a Chinese company € 31m in damages for infringing its patent, the largest amount ever awarded in an intellectual property case in the country.¹¹⁰

The conclusion that enforcement problems form the most important burden to protection is in line with an earlier survey conducted by the WIPO in 2002, which clearly showed that the basic principal barriers to eliminating counterfeiting and piracy do not exist because of the substantive law but rather in the remedies and penalties available (or not available) to stop and deter counterfeiting and piracy. The ineffectiveness of the enforcement system is often due to a lack of human resources, funding and practical experiences in IP enforcement of relevant officials, including the judiciary; insufficient knowledge on the side of the right holders and the general public, concerning their rights and remedies; and systematic problems resulting from insufficient national and international coordination, including the lack of transparency.¹¹¹

Similarly in South Korea, damages awards in civil litigations in case of a patent infringement often appear to be too low to be effective.

3.2.8. Future outlook

Notwithstanding the serious current enforceability problems in the Far East, these problems are expected to diminish once the IP systems in South Korea and – in particular – China mature, mainly through more and more experience with IP protection and litigation in that field. Especially when companies in those countries start carrying out more innovation themselves and when it is noticed that big companies stay away

¹⁰⁸ See US Trade Representative, *2005 Report to Congress on China's WTO Compliance*, p. 72.

¹⁰⁹ See US Trade Representative, *2005 Report to Congress on China's WTO Compliance*, p. 68.

¹¹⁰ See 'China fines Schneider €31m' in the Financial Times, 1 October 2007, p. 19.

¹¹¹ See IPR-Helpdesk, *Guide to border Enforcement of IPRS in the EU*, p. 9f.

because of the ‘unfriendly’ investor climate,¹¹² the importance of an adequate and effective IP protection will also be felt in those countries.¹¹³ China and South Korea have already become more innovative in the last years.¹¹⁴

There are signs that the standards of IP protection in China (and South Korea) are gradually rising:

- In a recent trademark infringement case involving the trademark holder “Lacoste” and three Chinese companies the Beijing People’s Court ruled in favour of the French apparel company, ordering the defendants to pay \$ 97,500 in damages. The case is encouraging for trademark proprietors, since it demonstrates willingness on the part of local administrations for industry and commerce to investigate trademark infringement complaints and impose fines on infringers. The amount of damages awarded also sends a clear message that the authorities are serious about clamping down on infringement.¹¹⁵
- In September 2007, the Supreme Court in Beijing upheld the Zhejiang Provincial High Court ruling ordering Chinese motorcycle manufacturer Zhejiang Huatian to pay Rmb 8,3 m to Yamaha of Japan for infringing its trademark.¹¹⁶
- Already the vast majority of IPR cases in Chinese courts concern exclusively Chinese parties. The risks to public health and consumer safety incurred by frequently unaware purchasers, will also be an important reason for a stricter IP protection, since consumers in those countries are particularly exposed to sales of these dangerous products.

¹¹² Research by the OECD also shows that strong patent rights have a positive effect on foreign trade, unless excessive levels of strength are achieved (see the report ‘The impact of trade-related intellectual property rights on trade and foreign direct investment in developing countries’ of 28 May 2003 (TD/TC/WP(2002)42/final), p. 4).

¹¹³ Companies in the Far East already start making more and more use of the existing possibilities of IPR protection themselves. E.g. the South Korean concern LG Electronics has recently sued the Chinese television manufacturer TTE for infringement of its patents in the field of digital television.

¹¹⁴ The UN Agency for IP has made public that the number of patents that have been applied for from China, in 2005 rose by 33% in comparison to the year before. With 420,000 applications, China ranks third behind Japan (approx. 420,000 applications) and the United States (approx. 390,000 applications). The patent applications by South Korean companies doubled between 1995 and 2005.

¹¹⁵ See ‘Lacoste Case is evidence of Protection for Well-Known Brands’, *International Law Office* 1 October 2007.

¹¹⁶ See ‘China fines Schneider € 31m’, *Financial Times* of 1 October 2007, p. 19.

Effective enforcement of IP rights is also essential in order to attract foreign investment, transfer of technology and know-how. Moreover, it is an indicator of international credibility and respect of the rule of law. Finally, in the mid-to-long term, it will encourage more domestic authors, inventors and investors and contribute to the development of these countries.

3.3. Effective protection: some guidelines

Having regard to the foregoing, the question may arise as to what is the most effective tool or manner to protect the knowledge and innovations of a particular company that is active in the shipbuilding sector. There is no easy answer to that question, as the answer will depend to a high extent on the specific circumstances of the case at hand. This section nevertheless aims to set out some practical guidelines that may be of help to companies that are considering protecting their technology.

Firstly, it is important to note that it may be possible to use more tools of IP protection at the same time, e.g. patent protection for the technological invention itself, design protection to protect the shape and trade secret for the process. Such a combination of tools (layers of IP) will normally ensure better protection (although possibly at higher costs), as it enables a company to match each innovation with the tool best suited to protect it. Even though such a layered approach might not entirely take away especially the concerns related to enforceability, it could nevertheless help an individual company to ensure better and more effective protection for its innovations.

Secondly, the advantages and disadvantages of contractual protection deserve some further attention. As was noted in the previous chapter,¹¹⁷ trade secrets (non-disclosure contractual clauses) have some important advantages compared to the classical instruments of IP protection (relatively low costs and little delay, broader scope, often lower litigation costs, focusing awareness). Despite these advantages, protection by trade secret is not always the most effective protection strategy.

Especially in the shipbuilding sector – where inventions often inevitably become publicly available soon after the ship is finished (or even before¹¹⁸) – it can be more beneficial to

¹¹⁷ See section 2.2.1 above.

¹¹⁸ The risk that information becomes available is substantial, due to the many players that are involved in the manufacturing process, the assessments by different classification societies, necessary maintenance etc. In big companies a great deal of the work can be done 'within the concern' which can diminish the risk of leakage to outsiders (an example is the company Odense that almost exclusively works for mother company Maersk).

be able to resort to classic IP protection that can be invoked against any infringing party and not (as with trade secrets) only against the persons that have breached their contractual non-disclosure obligations. Of course, trade secrets can still be useful for specific processes that are difficult to copy, such as integrating systems and complicated processes (which is especially important for yards). Although process-related inventions are also eligible for patent protection if they fulfil the criteria of novelty, inventiveness and industrial application, that will usually not be the case for the mere assembly of existing products for lack of the required degree of innovativeness.

Some market players have indicated that they prefer not to apply for a patent, because that necessarily entails that their invention will be revealed to others (patent information is publicly available) which would make it even more vulnerable for copying. However, it should be borne in mind that the fact that patents are made publicly available also benefits the industry as a whole, because the consultation of patent information can prevent companies from spending time and money on the R&D of products that already exist. Often creation that occurs is innovation that follows on other innovation, which mostly required some access to the learning of the first innovation.¹¹⁹

A factor that is also worth considering when assessing whether to apply for patent protection or to choose for contractual protection, is whether the (expected) benefits of patent protection will outweigh the (expected) costs of patent protection. In fields where innovations are made in rapid succession, a patent may become outdated within a relative short time period. In that event, it is not obvious that patent protection is the most (cost-)effective way of protection. For that reason technological companies sometimes refrain from applying for classic IP protection and try to take the utmost advantage of being ahead of their competitors for a short time. If the gains from protecting ideas are lower than the gains from sharing them, it is recommendable to do the latter.¹²⁰

Thirdly, for certain actors in the shipbuilding sector it may be worth considering IP aspects when designing a new product or a production process. In practice rather complex or unique products and processes will generally run a lower risk of being copied. Although such 'technical' solutions are not available to all market players, in some cases it may be a useful instrument to deter possible infringers.

¹¹⁹ See Susan DeSanti, 'Antitrust, Intellectual Property and Innovation: another view' in Hugh C. Hansen, *International Intellectual Property Law & Policy- Volume 6*, p. 99-3.

¹²⁰ See A. Pianon, 'Trade Secret vs. Open Source', ELER 2004, p. 61, who rightly states that all instruments aimed at protecting and "fencing" ideas (both classic and contractual IP protection) are artificial constructions of the legal system, which entail administration and litigation costs.

Lastly, it is submitted that trademarks may be broader applicable than their current use in the shipbuilding industry suggests. This study reveals that some shipyards and marine equipment suppliers already consistently mention their protected trade name on their products whenever possible, so that when a competitor copies its product, this normally (also) constitutes an infringement of trademark law. Given that (i) most companies will have registered trademarks anyway; (ii) trademarks are normally quite cheap and easy to apply to products; and (iii) a trademark infringement is often relatively easy to prove, this example may be worth following.

4. Knowledge, innovation and IPR in the shipbuilding industry

This chapter focuses on the relevance of knowledge, innovation and IPR in the shipbuilding sector. By means of introduction some key concepts relating to knowledge and innovation are outlined, before turning to the meaning of these concepts in the particular shipbuilding context. Then the practical use that the industry makes of the existing instruments of IP protection will be discussed, mainly based on the outcomes of the field and database research that was carried out within the framework of this study. Finally, an alternative or complementary way of looking at innovation and the interaction of companies will be introduced.

4.1. Knowledge and innovation: some key concepts

Knowledge and innovation are considered more and more as drivers for growth. The impact of innovation on export capabilities and economic performance is deemed significant.¹²¹ These concepts are normally defined as follows:

- *Knowledge* can be defined in several ways. Usually a distinction is made between know-how (referring to explicit knowledge) on the one hand, and know-what (referring to implicit knowledge) on the other hand. Even though both types of knowledge are obviously important, the latter type has become increasingly important given that information comes and goes faster and faster. Know-what is primarily embedded in human capital.
- *Innovation* can be seen as a measurement of the changes in knowledge base.

The strengths and weaknesses of innovation can be monitored by five key dimensions of innovation.¹²² The five dimensions are:

- Innovation drivers: indicators on human resources notably the structural conditions required for innovation potential;
- Knowledge creation: measures of the investments in R&D activities, considered as key element for a successful knowledge-based economy;
- Innovation & entrepreneurship: measures of the efforts towards innovation at the level of firms;
- Application: measures of the performance, expressed in terms of labour and business activities, and their value added in innovative sectors;

¹²¹ See for example the European Innovation Progress Report, EC DG Enterprise and Industry, 2006.

¹²² European Innovation Scoreboard-Inno Barometer.

- Intellectual property: measures the achieved results in terms of successful know-how.

In this study the emphasis mainly lies on the issues relating to the fifth dimension of innovation: intellectual property which measures the achieved results in terms of successful know-how. This may, in turn, lead to the establishment of intellectual property rights.¹²³ For the purpose of this study, a knowledge 'leakage' is defined as the action of transferring information or knowledge to third parties without the explicit permission of that company.

Innovation is often a result of research and development (R&D) efforts or learning-by-doing. Innovation can be related to products or services, logistics, marketing, internal processes, changing a business model, etc. Clearly, breakthrough product-innovations are most easily viable, but their occurrence is relatively limited.

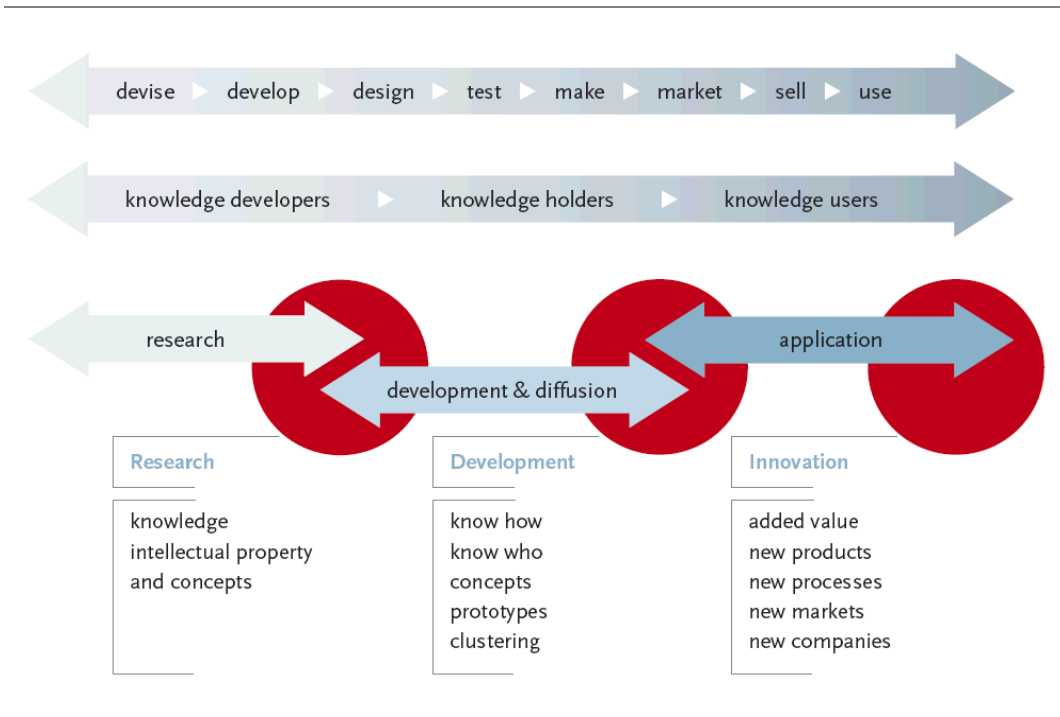
The concept of *innovation efficiency* measures how good countries are at transforming their innovation assets (education, R&D and innovation expenditures) into innovation results (turnover coming from new products, employment in high tech sectors and/or patents).

Additionally, it is useful to distinguish between incremental innovations (small changes which help to perform better) and radical innovations (which are new to the world). Thus innovation includes both the development of 'new' knowledge, and the innovative combination of existing knowledge with the objective to provide new concepts that are the basis for new processes, products and, increasingly important, new services.

Figure 4.1 on the next page visualises the RD&I (research, development and innovation) chain for knowledge-intensive industries.

¹²³ Defined in chapter 2 as rights granted to creators and owners of works that are results of human intellectual creativity.

Figure 4.1: RD&I chain for knowledge-intensive industries



Source: Brainport, 2007

4.2. Particularities of the European shipbuilding industry

As a general proposition, it can be said that the shipbuilding industry has a positive attitude towards innovation and is indeed rather innovative. There are several indications supporting this assumption.

In the first place, the 2006 Innobarometer of the European Commission revealed that 50% of the whole EU-25 economy is pro-innovation. This barometer also indicated that industry – including shipbuilding – is on average more innovative than other (non-ICT/computer related) services. Furthermore, the ‘transport equipment’ (NACE DM)¹²⁴ and industry related to ‘machinery and equipment not elsewhere classified’ (NACE DK 29) on average are rather innovative. An investigation in 2000 with regard to the innovativeness of the Dutch Maritime Cluster found that about 58% of the shipyards could

¹²⁴ NACE DM includes DM 35.1 (shipbuilding), but also DM 35.2 (railway) DM 35.3 (aerospace) and DM 35.4 (vehicles). See also section 5.2 below.

be labelled as pro-innovative, whereas this would be somewhat more for the marine equipment industry.¹²⁵

Moreover, the European shipbuilding industry has put its shoulders to the LeaderSHIP 2015 programme. Crucial in this regard is a focus on innovative measures and concepts in order to enable the industry to maintain or retain its market position. Much attention goes to shipbuilding manufacturing processes as well as the environmental protection systems (painting systems, ballast water management, monitoring of hazardous materials). The shipbuilding industry and the European Union jointly support innovative efforts. Through the LeaderSHIP 2015 the parties involved aim at creating more favourable conditions to stimulate innovation, with attention being paid to fields such as education, employment, level playing field, financial and guarantee schemes, protection of IPR, etc.

Typically, innovations in the shipbuilding industry are found in the processes and design of the ships, and are mostly related to the development and diffusion of knowledge on the one hand and application on the other hand. In addition, yards often share technological know-how with their suppliers and vice-versa. Shipyards and marine equipment suppliers often work closely together from the start (design stage) of the building of a new ship. These parties therefore often stimulate and influence each other to a high extent.

Consequently, the yards and the suppliers often know about or are familiar with each other's technological know-how and know-what. Moreover, it is not always clear to all the parties involved to what extent an innovation can legitimately be claimed by a particular party. Taking into account that especially marine equipment suppliers often supply parts to different (international) shipyards and thus have relationships with several competing yards, clear and comprehensive agreements are necessary to prevent disturbed relationships.

On the other hand, the shipyards are often able to use the latest technology because of the innovations of the marine equipment suppliers. It is particularly relevant to note in this regard that many marine equipment suppliers are also active to an appreciable extent in other sectors, such as aerospace, aviation or heavy industry. This enables these suppliers to use knowledge in and from different kinds of areas, which enhances innovation.

¹²⁵ De innovativiteit van de Nederlandse maritieme cluster, Dutch Maritime Network Series no. 16, 2000 (NML 2000a).

Independent research centres and (technical) universities are often also involved in the shipbuilding process and support or participate in the innovation efforts as 'knowledge providers'. One could for example think of the testing of new parts or products, such as measurements of extreme forces, sea keeping performance, design and used materials, noise and vibrations, and resistance.

In the past, innovation in the shipbuilding industry has often been re-active. Nowadays, much of the European shipyards are becoming increasingly pro-active to meet their customer's needs. Even though innovation in shipbuilding can be related to all ship elements, the main fields of innovation are related to the propulsion and other machinery, cargo handling systems, ship design concept, steel construction, hull design and structure, logistic integration and system integration.¹²⁶

4.3. Ship elements

A ship can be seen as being comprised of elements related to floating and sailing on the one hand – hull, propulsion (including steering equipment) and stability system – and different supporting systems related to the function and type of ship on the other hand.¹²⁷

Innovation in shipbuilding is related to all ship elements but the main fields of innovation are related to shipbuilding process, propulsion and other machinery, cargo handling systems, ship design concept, steel construction, hull design and structure, logistic integration and system integration.

The various ship elements with innovation examples are listed in *table 4.1* on the next page, covering both past and on-going R&D projects.

¹²⁶ See section 4.3 below.

¹²⁷ Following the conceptual approach as in the courses 'Shipbuilding' of Delft Technical University / VNSI, the elementary parts of a ship to be distinguished are *hull, propulsion (including steering equipment) and stability system*. These elements are necessary for the functions floating and sailing which are common for all types of ships. Depending on the type of ship and its purpose (carrying goods and/or people) different supporting systems are to be added. From a yard's perspective the parts usually are categorised from a cost breakdown approach. In that respect '*materials costs*' (hull, propulsion, cargo handling), '*labour costs*' (production, sub-contractors, design, administration), '*ship-specific financing costs*' and '*other direct costs*' are to be distinguished.

Table 4.1: Basic ship elements and examples of innovation

Ship element	Examples of innovation
Environmental protection system	<ul style="list-style-type: none"> – Painting systems – Ballast water management – Monitoring of hazardous materials
Hull	<ul style="list-style-type: none"> – New shapes – Double hull – Air-lubrication – Noise and vibration reduction – Fatigue – Light strong materials
Propulsion	<ul style="list-style-type: none"> – Screw design – Screw without propeller shaft – Alternative systems (e.g., new energy sources; sails) – Development of engine components
Stability system	<ul style="list-style-type: none"> – Hydraulic stabilisers – Stability tank systems
Central commanding (bridge)	<ul style="list-style-type: none"> – System integrations – Safety measures – Automation and monitoring
Ship board systems	<ul style="list-style-type: none"> – Air-conditioning – Waste disposal – Life saving
Power generation	<ul style="list-style-type: none"> – Emission reduction – Safety redundancy
Navigation	<ul style="list-style-type: none"> – Radar instruments – Integration bridge system
Loading and unloading system	<ul style="list-style-type: none"> – Remote operation – Cargo handling (RoRo, dry and wet, heavy)
Shipbuilding manufacturing process	<ul style="list-style-type: none"> – Joining techniques – Modularisation

Source: Policy Research Corporation in cooperation with the CESA IPR expert group

The *hull* can have many different shapes. Small changes can make a shape different, which means that this ship element cannot always be protected easily. On the other hand, specific coatings or technological innovations like air-lubrication can generally be protected through patent law. Other examples of innovations that will, in principle, be

protectable are the double hull or new designs which reduce noise and vibrations. Besides the use of patents, there may also be scope to protect a certain hull shape through design law or copyright.

The *propulsion* is an important and complex ship element which has a great impact on speed, noise, air-pollution, weight and space. This element typically represents 10 to 30% of the total value of a ship. In some cases it can be said that propulsion is the main innovative element of a ship. These innovative efforts are, for example, related to the development of engine components and light but strong materials. Patenting appears to be the most obvious protection mechanism here. The steering equipment is rather innovative as well. Although the hardware components like the screw, shaft and wheel are innovative and offer scope for being copied, the software integrating other functions of the bridge is rather complicated and is therefore more difficult to copy. An important part that counts many innovative efforts is the screw design, which has an impact on the resistance and the noise of the ship.

The *stability system* is generally speaking a low innovative element, which means that there is generally only limited scope for protection through classic IPR. Because the impact on the environment can be considerable, however, the ballast water management is subject to innovation. The same applies to hydraulic stabilisers, for example.

The *supporting systems* could include the instruments on the bridge, power generation, navigation equipment, loading and unloading systems, or specific equipment related to the type of ship, such as waste disposal and air-conditioning systems for cruise vessels. Some of these parts may be highly innovative and can represent up to 35% of the total value of a ship. The more complex the production process of the product or the necessary integration of the products (e.g. navigation equipment which includes hardware and software), the more difficult and expensive it will often be to copy. Stand alone components can be copied most easily, followed by the subsystems. Total systems, including software, generally offer less scope for being copied, because of the higher degree of complexity. It also occurs that shipowners explicitly demand their shipbuilder to install original, non-copied components. This is done to reduce risks and to ensure that maintenance can be carried out worldwide.

The level of innovativeness is certainly related to the type of ship concerned. For a typical ship that on average consists for 70% of parts purchased from equipment suppliers, a more detailed cost breakdown analysis reveals that 20 to 30% of the ship's value can

reasonably be labelled as innovative.¹²⁸ Although the value of innovations hardly ever represents the total ship value, it should be stressed that the innovativeness of certain ship parts can determine whether a ship as a whole will be sold or not – and may therefore have a crucial impact from a commercial point of view.

4.4. The use of IPR protection in practice

4.4.1. Protection attitude

The field research conducted in the framework of this study reveals that a clear majority of the participating shipyards protects their knowledge and innovations to a certain extent by making use of the existing protection mechanisms. Shipyards point out that the main reason for not using protection mechanisms is the unawareness of the possibilities and the value of solid legal protection. Much of the (process) innovation development is part of the daily business, and some companies seem to be unaware of the long-term benefits from protection of these innovations.

About 30% of the marine equipment suppliers indicate that they generally do not actively protect knowledge and innovations. Several suppliers indicate that, in their perception, using the existing protection mechanisms does not always result in sufficiently 'waterproof' protection. The enforcement of intellectual property rights – or rather the lack thereof – is mentioned as being a key problem in this regard.

The finding that not all market players are fully aware of IPR-related risks and possibilities is, of course, understandable to some extent as most companies will choose to invest their resources primarily in more direct means of staying ahead of competition. Especially for SMEs this could mean that limited resources are left for mapping (potential) leakages and taking preventive or corrective measures. This attitude can also be observed in other sectors.¹²⁹ Nevertheless, the outcomes of the field research underline that, generally, there is scope for improving awareness.

¹²⁸ This number of 70% has been indicated by the marine equipment suppliers and confirmed by several shipyards as an industry rule of thumb. This indicative percentage is also found in Drewry's report on the Marine Equipment Market (Drewry, 2002). For reasons of confidentiality of the cost-structure information, the details of this cost break-down (and the differences per ship type) have not been included in the present report. Clearly, as the 70% is an average figure, for certain types of (complex) ships, this might even be larger. See also section 6.2 below.

¹²⁹ See e.g. the Commission Communication on enhancing the patent system in Europe, COM (2007) 165 final, p. 13, and the Community Innovation Survey CIS-4.

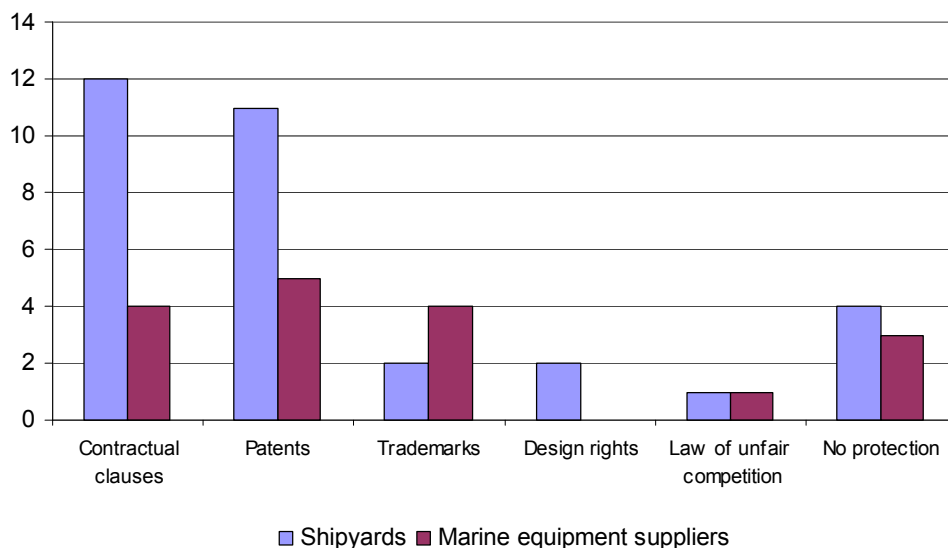
4.4.2. Protection mechanisms

Although most shipyards and marine equipment suppliers choose to protect their knowledge and innovations, the choice for a specific protection mechanism differs. The yards mainly use contractual clauses to protect information and knowledge throughout the whole production process. The second mechanism used by the yards to protect products and (parts of) processes is patenting. Trademarks, design rights and the law of unfair competition are used to a much lesser extent.

The choice of instruments is somewhat different for the equipment suppliers. Here patents are the preferred means of protection, followed closely by both contractual protection and trademarks. None of the responding suppliers indicated to use design rights (which is not surprising, given that this type of protection excludes the technical aspects of a design).

Figure 4.2 shows the distribution of the protection mechanisms used by the European shipbuilding industry. Some of the respondents indicate that they use several protection mechanisms.

Figure 4.2: Use of various protection mechanisms by the shipbuilding industry

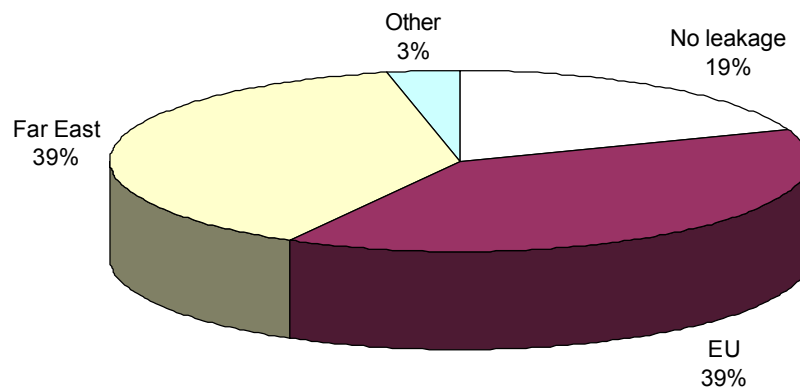


Source: Houthoff Buruma and Policy Research Corporation

4.4.3. Leakage destinations

In the inquiry the European shipyards and marine equipment suppliers indicated that in about 40% of the cases of an observed leakage the destination is a country in the Far East, e.g. China or South Korea. But according to the respondents, the same percentage of leakages occurred within Europe. The results from the inquiry, as shown in *figure 4.3*, indicate that the leakage problem within Europe may indeed be as prominent as the leakage problem to the Far East.¹³⁰

Figure 4.3: Leakage destination for European shipyards and marine equipment suppliers



Source: Houthoff Buruma and Policy Research Corporation

4.4.4. Number of leakages

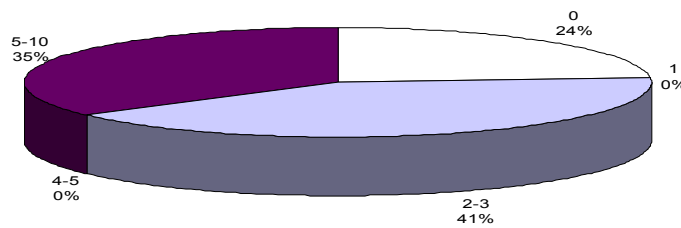
Figure 4.4 presents the distribution of the number of leakages for the European shipbuilding industry. In the past five years about 40% of the major yards were confronted with 2 to 3 leakage cases. One third indicated that leakage occurred between 5 and 10 times. Also, about 20% of the responding marine equipment suppliers detected between

¹³⁰ Although here it should be noted that one should, eventually, look at who is benefiting in the end from the leakage; when a leakage channel is labelled 'European', does not necessarily mean that the final destination of the leakage is within Europe (or the Far East, for that matter).

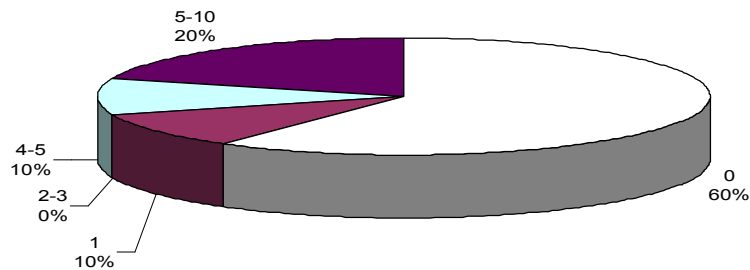
5 and 10 leakage cases, while 60% states not to have been confronted with any leakage at all.¹³¹

Figure 4.4: Number of leakage cases for the European shipbuilding industry

Shipyards



Marine equipment suppliers



Source: Houthoff Buruma and Policy Research Corporation

4.5. Leakage sources

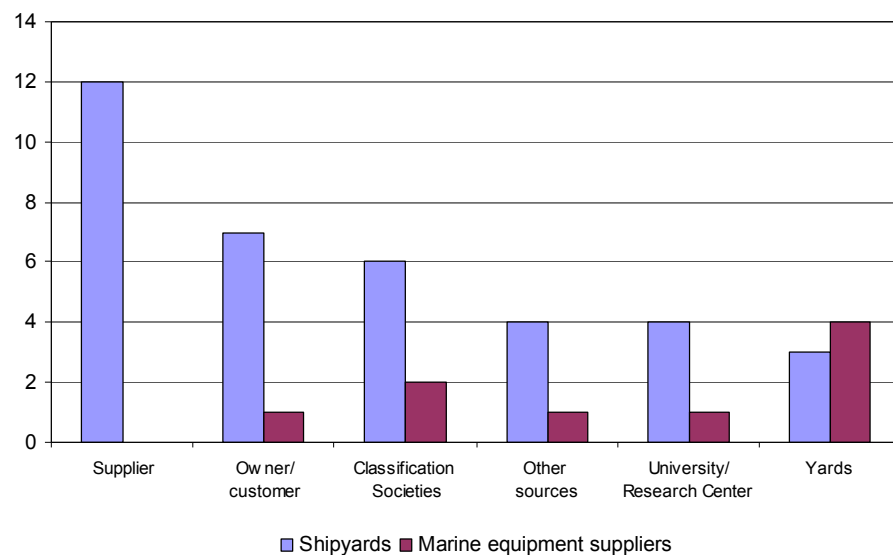
Infringements on IPR imply that the offender has knowledge about the exact characteristics of a product or process. Product knowledge can, for example, be obtained by reversed engineering (the infringer achieves the product and dismantles it which allows him to measure or determine the characteristics), or on the basis of publicly available information (such as marketing brochures).

¹³¹ For the sake of completeness, please note that not all of the respondents gave concrete examples or illustrations of the leakages. Furthermore, it should be borne in mind that the inquiry mainly covered the larger yards. Most smaller yards are, generally, likely to have a less profound (protected) knowledge base, which would imply a larger share of the 'no leakage' observations on a sector wide basis. On the other hand, no observation of leakage does not necessarily mean, of course, that there is no leakage. This could also signal a lack of awareness.

Knowledge about products and processes can also be obtained via third parties through different channels. Such channels are the leakage sources from the point of view of the shipbuilding industry. In answering the questionnaire both shipyards and marine equipment suppliers pointed out that they experience leakage of knowledge or innovations through different channels. These various channels are summarised in *figure 4.5* on the next page.

Although this figure demonstrates how frequent a leakage source is determined by the shipyards and the marine equipment suppliers in the sample, it does not necessarily represent the impact of the leakage. The economic value of a certain leakage may vary with the leakage source. Consequently, the economic impact of one leakage by a less frequently mentioned leaking source could be more cumbersome than the consequences of leakage by another, more frequently mentioned leakage source.¹³²

Figure 4.5: Leakage sources for European shipyards and marine equipment suppliers



Source: Houthoff Buruma and Policy Research Corporation

¹³² In chapter 6 below the economic impact of leakages will be further investigated.

The Houthoff Buruma and Policy Research Corporation survey indicates that, according to shipyards, *suppliers* are the most important source of leakage.¹³³ As was mentioned before, suppliers and sub-suppliers are often involved in the design and the building of a ship from a very early stage on. From the point of view of the yards, the suppliers are expected not to transfer this knowledge to other yards. Nevertheless, in the yards' opinion knowledge and innovations are not infrequently leaked via the (sub) suppliers.

Perhaps not surprisingly, the impression that the project partner sometimes leaks sensitive information is mutual: marine equipment suppliers list the *yards* as the main source of leakage. These outcomes illustrate the close collaboration that often exists. To some extent, suspicions that the other party does not treat 'its' business secrets with sufficient care may therefore be inevitable. These findings could, however, also function as an incentive to making clearer agreements on who owns what intellectual property (and which aspects are owned jointly). The impression exists that this is not always sufficiently clear to the parties involved.

Infringements between suppliers (2007)

On behalf of a German yard, a European marine equipment supplier invested in the innovation of a helicopter elevator for a mega yacht and requested another European marine equipment supplier to check the calculations. The first supplier now accuses the second one that he sold his elevator design to the shipyard, which can now order this elevator elsewhere (for a lower price) now it possesses the drawings of this innovation. A lawsuit is currently in progress.

Some shipyards also point to their direct competitors, i.e. other yards, as being a source of leakage. Several yards report that they sometimes consider not to subcontract orders to another yard (partially) out of fear that their knowledge will be used for other purposes by the subcontracted yard, even though this may mean that they will have to refuse an order of their customer (e.g. due to a lack of capacity). Obviously, the latter will only occur in exceptional circumstances, as yards will generally not be inclined to refuse orders. In any case such statements can be understood as confirmation of the importance that the concerned yards attach to safeguarding their IPR.

Although the *customers or owners* do not receive the information about all the suppliers that were involved in the production of the ship, usually the design blueprints are (or have

¹³³ The 2005 CESA survey (see footnote 3) put suppliers on a more equal footing with customers and classification societies as the most important leakage channels.

to be) handed over together with the ship. Normally this is done with the legitimate aim of enabling later repairs and maintenance worldwide. This practice, however, makes it relatively simple for an owner to ask another yard to copy the ship in order to get a (cheaper) duplicate. The yards indicate that this is the second main source of knowledge leakage. They also note that it is often very hard to take action against this source of leakage, because of their business relationship with the customer. Typically, yards only have a few large customers.

A disincentive to export (2006)

A European shipyard built a dredger for a Chinese customer. After the ship had been delivered, the Chinese owner invited several shipyards to tender for the production of more, identical dredgers. The European yard failed to win this second contract, but was confronted with a nearly exact copy of its ship in a magazine after a certain time. At the moment, the shipyard is preparing a lawsuit and has decided not to export complex vessels or elements to China anymore.

For the equipment suppliers, this alleged leakage through (final) customers seems less of an issue. This can be explained by the fact that their customers are often the yards, and not the end users of the ship.

Both yards and suppliers point to *classification societies* as a notable source of leakage. Classification societies are organisations which develop and apply technical standards to the design, construction and assessment of ships (and other marine facilities) and which carry out survey work on ships.¹³⁴ Flag states often authorise classification societies for the inspection and statutory certification of their ships. The main issues here is that yards and suppliers are obliged to give the classification societies a profound insight into the workings of their (innovative) products in order to get the product, or the ship as a whole, approved. Although it is undisputed that classification societies need to have a sufficient insight in order to perform their tasks, it is less evident that the classification societies indeed need to receive all the information they currently require. This does not always seem to be the case. The question as to which information classification societies actually

¹³⁴ There are more than 50 organisations worldwide which define their activities as providing marine classification, but only 13 classifications societies are presently recognised by the EU. These are: Bureau Veritas (BV); China Classification Society (CCS); Det Norske Veritas (DNV); Germanische Lloyd (GL); Hellenic Register of Shipping (HRS); Korea Register of Shipping (KR); Lloyd's Register of Shipping (LR); Nippon Kaiji Koykai (NK); Polish Register of Shipping (PRS); Registro Internacial Naval (Rinave); Registro Italiano Navale (Rina) and Russian Maritime Register of Shipping (RS). See OJ C 135/04 of 19 June 2007 and www.emsa.europa.eu.

need in order to perform their tasks is particularly relevant given that several yards and suppliers feel that the classification societies do not treat sensitive information with sufficient care and confidentiality.¹³⁵

Several companies point forcefully to the combination of functions of many classification societies: on the one hand they act as *de facto* public bodies testing, certifying and registering products and ships, while on the other hand they perform a range of purely commercial, consultancy type of services. To the extent that classification societies have separated (*de facto* or *de iure*) these two roles, the contacted shipbuilding companies are often of the opinion that that such 'Chinese walls' mean little in practice.¹³⁶ On the other hand, it should be noted that to date only little proof can be shown of these often strongly held beliefs.

The role of a classification society (2006)

A European shipyard has developed specific arctic ship technology. The yard indicates that a classification society received information and documentation about this technology and forwarded this to a Korean yard. This Korean yard even published elements of this information in their brochures. The European yard discovered this and approached the Korean yard about the matter. The issue is now under consideration.

Another source of leakages that has been identified in the inquiry is *universities and research centres*. These institutions are often hired to test specific innovations during the design and construction process, which provides them with information on new knowledge and innovations. Some claim that these parties use this information in other research requests or in their own investigations. There appears to be, however, little proof to support this claim. More generally, this issue does not seem to be a crucial leakage vehicle to most shipbuilders and equipment providers.

¹³⁵ SMEs may be affected in particular, as they (in cases where they are sufficient aware of the problem of potential leakages) often lack the bargaining power vis-à-vis the classification societies to negotiate and implement adequate contractual clauses or to take other measures.

¹³⁶ A related complaint with regard to the classification societies is that, in testing and certifying new products, they do not always apply equal standards. In particular, this is said to imply that sometimes products of inferior quality or copied products are tested and certified. Allegedly it also occurs that certain marine equipment products (particularly the smaller products) that are tested are not the same as the products that are eventually applied onboard the ship. This may not only result in unfair competition, but also in safety and liability risks.

The last category of leakage vehicles consists of *other sources*. This category includes leakage through consultants, designers or employees of the yards and the suppliers. Consultants and designers are generally in a similar position as suppliers. Examples of leakage by employees can be the result of corruption, or a change of employer. Within organisations the awareness of the importance of protecting intellectual property is often not recognised at all levels, and employees sometimes simply seem to share information too easily (e.g. at congresses or during contacts with third parties). Furthermore, technological information is sometimes disclosed through joint venture partners. It has occurred several times that, after a successful cooperation, the business partner, e.g. from the Far East, later ran off with the obtained know-how.¹³⁷

Leakages through third parties (2004)

A European shipyard developed the technology for an arctic ship to make it double acting. The yard obtained a patent on this technology. However, a European ship design company is said to have transferred information about this technology to a Singaporean shipyard and to European propulsion suppliers, which built three vessels based on this technology. The information was also leaked to a Korean yard, a Korean government organisation and a European propulsion supplier which now have one ship under construction, using this double acting ship concept developed by the European yard. The case is currently under investigation.

4.6. Use of patents

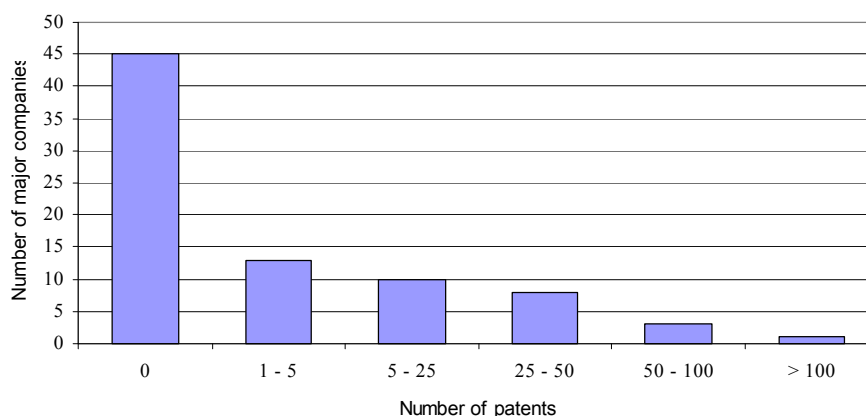
Based on the outcomes of the inquiry discussed above, patenting can be considered the classical instrument of IP protection (i.e. excluding contractual clauses) that is most often used by the shipbuilding industry. Therefore, further research has been done into the use of this instrument.

Figure 4.6 on the next page visualises the number of patents owned by around 80 major European shipyards and marine equipment suppliers according to the Espacenet

¹³⁷ There are quite a number of shipbuilders and equipment suppliers that have engaged in such a joint-venture type investment in China. A recent example is that of a joint venture between the China Shipbuilding Industry Corporation group (China Shipbuilding), through Qingdao Qiyao Linshan Power Development Company Ltd, Wärtsila Corporation of Finland and Mitsubishi Heavy Industries Ltd., creating the new company Qingdao Qiyao Wärtsila MHI Linshan Marine Diesel Company (COMP/M.4286, approved by the Commission on 24 April 2007). The joint venture is active in the manufacturing and marketing of two-stroke low-speed marine diesel engines.

database. Most of these patents are related to the propulsion, power generation and loading and unloading systems.

Figure 4.6: Number of patents of European shipyards and marine equipment suppliers



Source: Houthoff Buruma and Policy Research Corporation based on Espacenet patent database

This database research indicates that the majority of the yards and marine equipment suppliers that do own patents only have a relatively limited number of patents in their intellectual property portfolio. The parties that possess a more substantial number of patents (over 25 patents) tend to be the bigger yards and suppliers, as is to be expected. The relatively high proportion (over 50%) of yards and suppliers that do not appear to possess any patent at all may be more striking. It can reasonably be assumed that – with some notable exceptions – small and medium-sized enterprises often only own a limited number of patents at most.

This relatively low share of patents is in line with earlier research, which shows that – depending on the sector involved – companies often give priority to pursuing business strategies such as sales or service efforts, being first with an innovation, the ability to move quickly up the learning curve, and secrecy, rather than obtaining the maximum number of patents.¹³⁸

¹³⁸ Richard C. Levin et al., *Appropriating the Returns from Industrial R&D*, Brookings Papers on Economic Activity p. 783, 795-96 (1987). See also Susan DeSanti, 'Antitrust, Intellectual Property and Innovation: another view' in Hugh C. Hansen, *International Intellectual Property Law & Policy- Volume 6*, p. 99-3 and her reference to Wesley M. Cohen & Richard C. Levin, 'Empirical Studies of Innovation and Market Structure' in Richard Schmalensee & Robert Willig (eds), *Handbook of Industrial Organization* 1989, p. 1059, 1092-93.

4.7. Measures to reduce leakages and reasons for non-protection

All in all, the outcomes of the field and database research lead to a rather mixed picture. On the one hand, shipyards and marine equipment providers tend to use both classical and contractual ways to protect sensitive information. Moreover, they generally feel that such protection is important for their competitiveness. About 70% of the shipyards and marine equipment suppliers who experienced loss of knowledge through leakages indicate that they do take certain measures in order to prevent leakage of knowledge. These measures are of a diverse nature and vary from putting a radical stop to delivering complex products to (Asian) countries to initiating law suits, sometimes with the partial aim of establishing a reputation in the industry of not being afraid to go down this road. The most cited measures, however, aim at increasing the awareness of a company's employees of the value of knowledge, whether this knowledge is legally protected or not.

On the other hand, it can be concluded that the shipbuilding industry does not always fully exploit the protection mechanisms that are at its disposal to the highest extent legally possible. In chapter 3 some possible burdens to effective IP protection were sketched.¹³⁹ The field research confirms that many of these factors are in practice indeed a reason for companies not to protect their knowledge and innovations. It is to be expected that companies strike a particular balance between (perceived) risks and (expected) costs; from the inquiry it appears that the costs of protection are often considered too high in this respect.

A further reason for non-protection appears to be a lack of awareness, both with regard to the advantages and disadvantages of the available options to protect sensitive data and with regard to the potential risks that may come with non-protection. The balance struck between risks and costs referred to above sometimes appears to be based on rather general assumptions, and not always on detailed factual or legal information. As has been noted before,¹⁴⁰ it is understandable and not typical for the shipbuilding sector that especially SMEs may decide to dedicate their (limited) resources primarily to more direct means of staying ahead of competition. Nevertheless, the outcomes of this study underline that increasing the level of awareness of IPR-related issues, especially for SMEs, can be valuable in addressing the challenges that exist at present.

Furthermore, some innovative companies point to the obligatory publication that is often implied in acquiring protection. Especially in combination with the problems of enforcement that exist in the Far East – which many see as the most urgent problem in

¹³⁹ See section 3.1 above.

¹⁴⁰ See section 4.4.1 above.

this regard¹⁴¹ – this makes a significant number of companies decide not to apply for protection in the first place. Often these companies prefer to dedicate all their time, energy and resources to innovating faster than their competitors, rather than investing too much in establishing an expanded range of IPR.

4.8. Knowledge and innovation trends

Over the years, the time to market innovations has become shorter. A useful innovation today can be outdated tomorrow. Just working harder does not always guarantee companies that they will stay ahead of competitors, whereas this could under circumstances be achieved by working smarter and more efficiently. Furthermore, today there is often a growing mobility of highly experienced and skilled people, a growing presence of private venture capitalists, a decreasing time to market products and services, and generally more demanding customers and suppliers.

For many decades, what can be described as the ‘closed innovation landscape’ has been the basis for industrial or commercial success. This model implies that companies generate their own ideas, which serve as the basis on which they then further develop, build, market, distribute, service or finance. This generally makes these companies internally focused and strongly self-reliant. From the perspective of a closed innovation landscape, diffusion of knowledge is a threat because the ideas that start in a firm and subsequently leak out (free-riding) can no longer be converted into cash. Consequently, the incentives to invest in research and development diminish, causing the scope for vital discoveries and breakthroughs to become smaller.

‘Open innovation’ takes quite a different approach towards the current trends sketched above.¹⁴² Broadly speaking, open innovation takes these trends into consideration and aims at making optimal use of factors external to the company. Companies can stimulate each other to invest in R&D and seek the market for innovations that have no value for other companies, but may have high potential for themselves.

Open innovation is, however, not to be misunderstood as ‘publicly available’. It more generally provides a means to save costs and get rights to use the information gained,

¹⁴¹ See section 3.2 above.

¹⁴² The concept of open innovation has received much attention over the last five to ten years. *Open innovation* (2003) by H. Chesbrough can be seen as one of the main reference works in this field. See also U. Suthersanen, G. Dutfield and K.B. Chow, *Innovation without Patents* (2007), in which it is discussed to which extent innovations should or should not be protected, and the implications this has upon the ability of local manufacturers to learn to innovate.

while, clearly, pure ‘application’ driven research largely remains company specific. Moreover, it offers the additional advantage that technology that is not used can be developed further and more rapidly than otherwise would have been the case. In that way the innovation processes can be accelerated through mutual gain.¹⁴³ This open-innovation approach to R&D still finds its roots in classic IP law, but sees IP as a solution to commercialise a new technology or product instead of a static proprietary concept.¹⁴⁴

Companies are increasingly embracing open-innovation principles.¹⁴⁵ Patent auctions are, for example, a way to facilitate such IP-related transactions.¹⁴⁶ Moreover, big companies (such as Microsoft and Philips) now often share some of their knowledge with other companies by entering into patent pooling arrangements. Patent pools involve two or more patent holders contributing patents to a pool and offering multi-patent licences. Those pools can provide substantial pro-competitive benefits by integrating complementary technologies, providing an efficient mechanism to resolve patent claims and reducing transaction costs associated with licensing.¹⁴⁷ Another element of open innovation is having companies and universities work together on developing innovations, as is sometimes already experienced in the shipbuilding industry.¹⁴⁸

Knowledge diffusion in an open innovation landscape is seen as an opportunity rather than a threat, because it enables to differentiate on technologically advanced products, services and knowledge, and it makes innovations (from other sectors or other countries) more easily accessible for use.

¹⁴³ Also see Economist Intelligence Unit, ‘The value of knowledge – European firms and the intellectual property challenge’, 2007, p. 13.

¹⁴⁴ Also see Economist Intelligence Unit, *lc*, 2007, p. 14. In the survey conducted by the Economist, it also shows that companies expect a rise of the importance of IPR in the coming years (see p. 20). To have a strong negotiation position, one must have a good block of patents. Also see B. van Dijk, ‘Octrooien inkopen als wisselgeld’, *Financieele Dagblad* of 12 March 2007.

¹⁴⁵ Also see Economist Intelligence Unit, *lc*, 2007, p. 3.

¹⁴⁶ Such patent auctions are already quite common in the United States of America. The American company Ocean Tomo has recently organised a few auctions in Europe (inter alia in München and London). The rising popularity of patent auctions has a spin-off effect in the sense that it becomes clear how valuable patents can be.

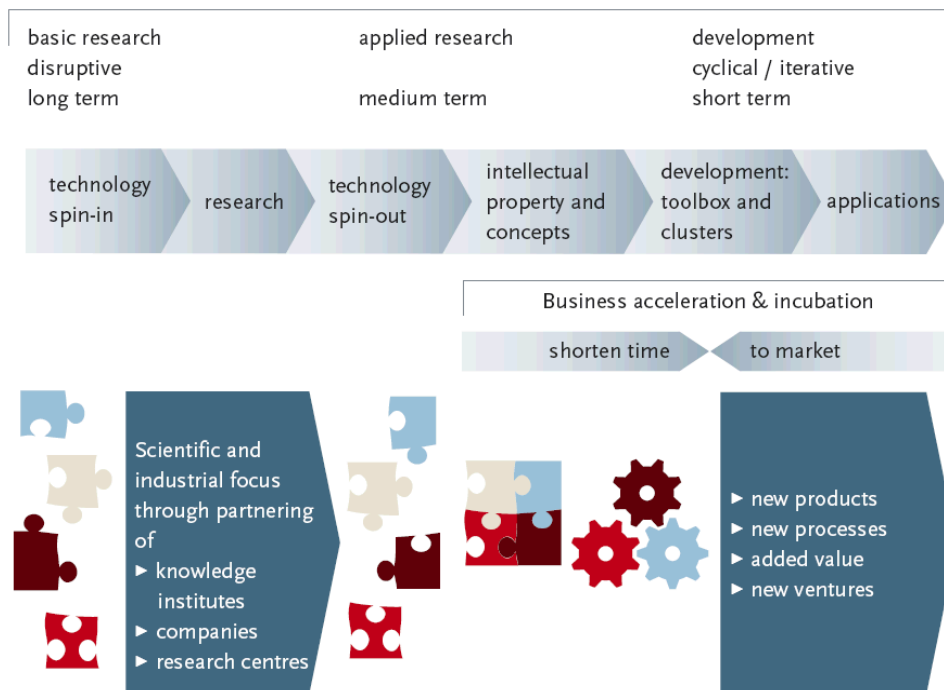
¹⁴⁷ A recent example is an agreement by Microsoft and Samsung to share a number of their patents by providing each other with licences. That gives Microsoft the opportunity to use Samsung’s patents in the field of digital media and computer technology, whereas Samsung can use Microsoft’s knowledge for the development of music players and camcorders. Microsoft made comparable arrangements with Xerox, NEC, Seiko, Epson and Novell. See ‘Microsoft deelt met Samsung patenten’ in *Financieele Dagblad* of 27 April 2007.

¹⁴⁸ As an example, in the field of microelectronics and nanotechnology the Belgian research centre IMEC, founded in 1984, has developed into an ‘interuniversity – interindustry’ research centre, hosting about 400 industry residents on a total of 1,500 people.

Clearly, an open innovation approach implies new challenges as well. Emphasis in an open innovation landscape will move to issues as how to fund the seed costs and how to capture a portion of the value (financial and/or image) coming from innovation. Such an approach also requires some degree of strategic planning and management system with regard to intellectual property. Designing and maintaining a patent pool's governance can, for example, also prove challenging. Beside the presence of good knowledge institutions, the open innovation (or 'network') approach also places greater emphasis on mechanisms of knowledge transfer, the absorption capacity, entrepreneurial spirit of companies and the government's role to create favourable conditions.

In *figure 4.7* the open innovation concept is visualised and the 'network model' is seen as a driver to shorten the time to market and to stay ahead.

Figure 4.7: Network model



Source: Brainport, 2007

5. The economic importance of the European shipbuilding industry

Attention now turns to the economic aspects of the topic under investigation in this study. To this end, the present chapter maps the economic importance of the shipbuilding industry in Europe in terms of key figures such as turnover, value added and employment while distinguishing between direct and indirect effects.

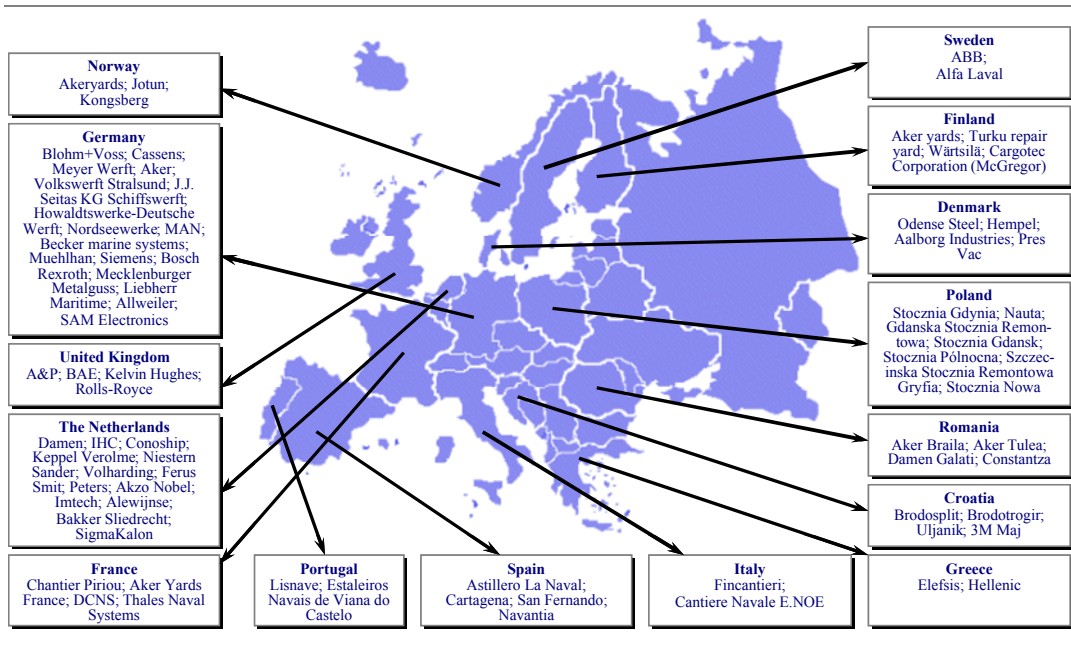
5.1. The European shipbuilding industry: market structure and profile

The European shipbuilding industry is composed of the shipyards on the one hand and the marine equipment suppliers on the other hand. As has already been observed in the previous chapter, both sectors in fact have close relationships within the production chain. Often, already in an early stage, shipyards and marine equipment suppliers cooperate towards achieving the customers' demands.

Not only products but also processes are continuously improved. Shipyards more and more take the role of assembler: bringing together parts (e.g. hulls) built elsewhere and making an improved use of products and services from suppliers. The complexity and the challenge in this approach lies in the fact that the yards continuously have to coordinate the processes in which sometimes dozens of equipment suppliers are involved. Complex and challenging as this may be, this often enables yards to work efficiently and to reduce cost, which results in a stronger competitive position.

Figure 5.1 on the next page gives an overview of some of the major stakeholders in the European shipbuilding sector. An alphabetic and more comprehensive list of these shipyards and marine equipment suppliers can be found in *Annex II*.

Figure 5.1: A selection of major European shipyards and marine equipment suppliers



Source: Policy Research Corporation

The position of the European shipbuilding industry on a world scale is related to the innovativeness of the sector. In Europe, mainly ships of high complexity are built. Typically dredging vessels, offshore vessels, naval ships, tugs, cruises and other passenger ships consist of high technology and complex system integration. This becomes apparent when considering the compensated gross tonnage (CGT) measure, which enables a more sophisticated macro-economic evaluation of shipbuilding workload than would be possible when purely considering measurements on a deadweight tons (DWT) or gross tons (GT) basis.¹⁴⁹

Although in terms of tonnage a large part of the world production is built outside Europe, Europe hosts many specialist yards. In specialised segments they hold a leading market position. In total, the European shipyards' (CESA members¹⁵⁰) *new orders* in 2006

¹⁴⁹ CGT stands for compensated gross tons. It is an international unit of measurement agreed within the OECD intended to express in a standardised way the amount of work at the shipyards when building new commercial ships. The CGT of a ship is calculated by multiplying the Gross Tons (GT) of the ship by a conversion factor (= CGT coefficient). The conversion factors vary with ship type and ship size. (CESA, Shipbuilding Market monitoring Report n° 6, March 2007, page 37).

¹⁵⁰ The CESA member countries are Croatia, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Norway, Poland, Portugal, Romania, Spain and the United Kingdom.

represent 9.4% (EU 25 = 7.3%) of the world's new orders (57.3 MCGT worldwide), led by Korea (38.2%), China (23.3%) and Japan (19.5%). Container vessels represented 19.0% of total new orders, while crude oil tankers and product and chemical tankers account for 29.2%. The European *order book* at the end of 2006 reached 16.9 MCGT.¹⁵¹ In financials terms, the European order book represents a relatively higher value than the order books of the Asian countries mentioned before, because of the complexity of the ships built in Europe.

Table 5.1 represents the number of ships on order as of April 2006. This table demonstrates that Europe-based companies play a leading role for different types of complex ships and passenger ships. Tankers and bulk carriers, however, are ordered less frequently at European shipyards.

Table 5.1: Number of ships on order as of April 2006

	EU	Korea	Japan	China	US	Other	Total	EU/Total
Miscellaneous*	273	7	9	48	27	38	402	68%
Container	255	445	82	260	2	108	1152	22%
Dry cargo	200	11	56	125	8	123	523	38%
Tanker	146	637	354	250	13	145	1545	9%
Passengers ship	91	3	1	2	7	49	153	59%
Offshore	85	10	7	61	27	195	385	22%
RoRo	47	20	98	14	1	24	204	23%
Bulk carrier	10	36	491	175	0	90	802	1%
Total	1107	1169	1098	935	85	772	5166	21%

Note: including naval, patrol, anti-pollution, fishing, dredging and research vessels, tugs and icebreakers.

Source: *Lloyd's Register Fairplay*

5.2. The economic importance of the European shipbuilding industry

Determining the economic importance of the European shipbuilding industry equals, in practice, making an estimate; the information in the tables in this section should be interpreted accordingly. The Eurostat data for the shipbuilding industry also includes pleasure and yachting boats, yet the allocation of companies to this segment is not clear and may be doubtful. For the marine equipment industry, Eurostat can not deliver instantly sector figures as the sector does not match with a clear or single statistical classification. Due notice is taken from the employment figures published in 2006 by DG

¹⁵¹ Figures published by CESA in their Shipbuilding Market monitoring Report no. 6, March 2007. At the end of the first quarter of 2007, the order book indicates the following market shares: EU 9%, Japan 10%, Korea 33% and China 38% (with the remaining 10% ordered elsewhere in the world).

Fish and Maritime Affairs, although these figures are also rather rough estimates.¹⁵² For the marine equipment industry the employment figure is in line with the one provided below, whereas for the shipbuilding in those figures only the employment related to the building and repair of sea-going (civil) vessels and vessels intended for travel on inland waterways and scrapping is listed (being part of the Eurostat figures for shipbuilding).

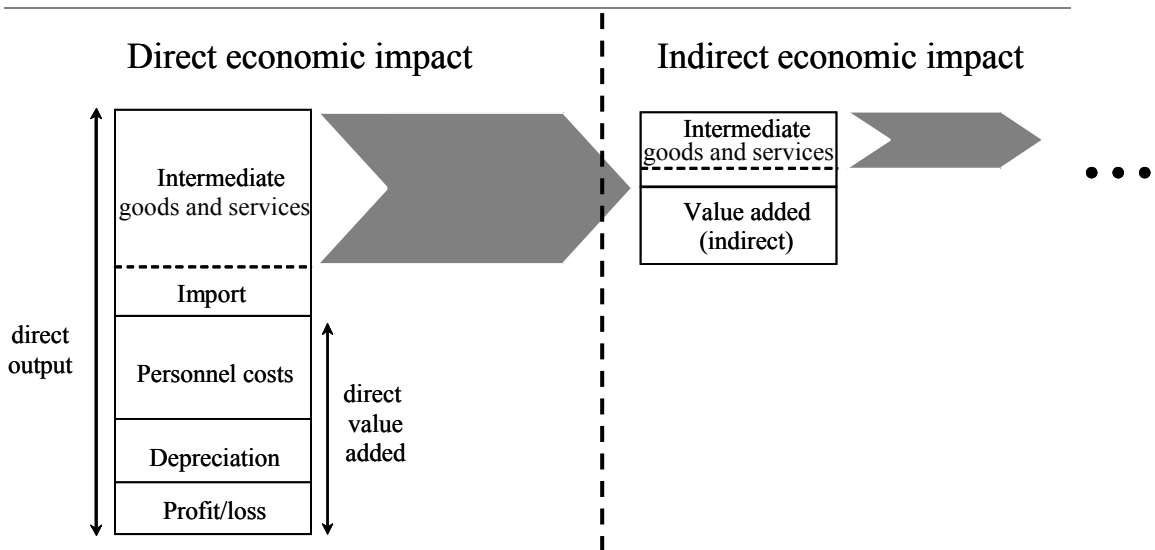
5.2.1. Direct and indirect effects

In terms of employment and value added, both shipyards and marine equipment suppliers generate a *direct* effect on the domestic (and European) level. Furthermore, they create economic activity in other sectors by purchasing goods and services which generates an *indirect* effect.

Figure 5.2 on the next page visualises these rippling effects. The purchase of intermediate goods and services, used to realise the direct production, requires economic activity and employment from suppliers which are counted as an indirect effect. On average the shipyards purchase some 70% of the ship value from marine equipment suppliers. The indirect effect as a result of the yards' activities is therefore relatively high.

¹⁵² In *Dynamic European Maritime Clusters* (chapter 11), ed. by Niko Wijnolst on behalf of the Maritime Forum / Dutch Maritime Network / European Network of Maritime Clusters, Chris Peeters and Harry Webers of Policy Research Corporation discuss the definition and data issues at stake in more detail. From the earlier research on the Economic Impact of Maritime Clusters in Europe where a screening of all available data sources had been performed, it was clear that the overall availability and quality of data is rather low. Since then some improvements have been made (in particular the set-up of maritime cluster organisations in different countries has had a positive effect), yet to date providing a comprehensive EU-27 wide fact sheet still remains an estimate. Recently Eurostat launched an invitation to tender for the architecture and elaboration of an integrated socio-economic database in the field of the maritime, sea-related sectors.

Figure 5.2: Direct and indirect economic impact of the European shipbuilding industry



Source: Policy Research Corporation

Because of the interactions between shipyards and marine equipment suppliers, adding up of the key economic figures should be done with utmost care.¹⁵³ The calculations to determine the indirect and total effects of the shipbuilding industry in this report are in line with the earlier work of Policy Research, in particular the 2001 study for the European Commission.¹⁵⁴

For the shipyards *in stricto sensu*, Eurostat statistics provide clear figures for the direct economic impact following NACE classification DM 35.1. However, this also contains the statistics related to building and repairing of pleasure and sporting boats besides building and repairing of naval and merchant vessels.¹⁵⁵ For the marine equipment suppliers figures are not readily available and have been estimated in line with the approach used

¹⁵³ Of the direct effects of the marine equipment industry, a part must be seen as indirect effects of the shipbuilding industry. Also, the effects in one country can also be the indirect effect of activities in another country. When accumulating direct effects a correction is therefore necessary to avoid double-counting.

¹⁵⁴ *Economic impact of maritime industries in Europe*. Policy Research Corporation (2001).

¹⁵⁵ *Nomenclature générale des Activités économiques dans les Communautés Européennes* (NACE – General Industrial Classification of Economic Activities within the European Communities). NACE DM 35.1 contains building and repairing of ships and boats and consists of NACE 35.11 (building and repairing of ships) and 35.12 (building and repairing of pleasure and sporting boats). Note: the sum of categories DM 35.11 and DM 35.12 may not equal the total amount of DM 35.1 because some countries only release the total values.

in the earlier 2001 study which departs from a (rather broad) definition of the marine equipment industry put forward by BALance in their 1998 study.¹⁵⁶

5.2.2. Key figures on EU 27 + Norway

In *figure 5.3* the direct economic impact of the European shipyards is summarised.¹⁵⁷ The turnover accounts for some € 39 billion, value added is € 11.5 billion and the shipyards employ directly some 293,000 persons (all figures including Norway).¹⁵⁸ Clearly, if one would not take into account the building and repair of pleasure and yachting boats, one will end up with a smaller sector size.

Figure 5.3: Direct economic impact of European shipyards

Shipyards			
Direct effect	Turnover	Value added	Employment
	€ 39 billion	€ 11.5 billion	293 000

Source: Policy Research Corporation based on Eurostat

¹⁵⁶ Although no single NACE classification is readily available to measure the direct economic impact of the marine equipment industry, at least category DK 29.1 (manufacture of machinery for the production and use of mechanical power; except aircraft, vehicle and cycle engines) has to be taken into account. Other categories which contribute partly to the economic impact of the marine equipment industry are categories G 51.1 (wholesale on a fee or contract basis) with subcategory G51.14 (agents involved in the sale of machinery, industrial equipment, ships and aircraft), G 51.6 (wholesale of machinery, equipment and supplies) with subcategory G 51.65 (wholesale of other machinery for use in industry, trade and navigation) and I 63.2 (other supporting transport activities) with subcategory I 63.22 (other supporting water transport activities).

¹⁵⁷ Based on the most recent Eurostat data, both commercial vessels and pleasure and sporting boats are included. If one would only consider commercial shipbuilding, including naval shipbuilding, this would yield an employment of 230,000.

¹⁵⁸ Excluding Norway turnover is € 33 billion, value added € 9.7 billion and employment 265,000 people.

In figure 5.4 the direct economic impact of the European marine equipment industry is summarised.¹⁵⁹ It is understood that turnover amounts to approximately € 26 billion, value added to € 10.8 billion and employment amounts to some 287,000 persons.

Figure 5.4: Direct economic impact of European marine equipment industry

Marine equipment suppliers			
Direct effect	Turnover	Value added	Employment
	€ 26 billion	€ 10.8 billion	287 000

Source: EMEC (based on study 'Economic impact of maritime industries in Europe')

Figure 5.5 provides key figures on the total economic impact of the European shipbuilding industry. The total economic impact is the sum of the direct and indirect impact of the shipyards and the marine equipment industry, filtered for double-counting.

Figure 5.5: Key figures European shipbuilding industry

Shipyards				Marine eq. suppliers			Shipbuilding industry				
Indirect effect	Turnover	Value added	Employment	+	Turnover	Value added	Employment	=	Total Turnover:	Total Value added	Total Employment
	€ 27 billion	€ 12.1 billion	290 000		€ 17 billion	€ 7.6 billion	149 000		Between	Between	Between
Direct effect	Turnover	Value added	Employment		Turnover	Value added	Employment		€ 85 billion and € 90 billion	€ 32 billion and € 34 billion	750 000 and 800 000
	€ 39 billion	€ 11.5 billion	293 000		€ 26 billion	€ 10.8 billion	287 000				

Source: Policy Research Corporation

¹⁵⁹ For the purpose of this study the recent EMEC update of the 2001 figures has been followed. In these figures, classification societies and other service and knowledge providers are not included. See www.emec-marine-equipment.org/marine_equipment/facts_and_figures.asp (28 November 2007).

These figures reveal that:

- the indirect effects of the shipyards are much higher than the indirect effects of the marine equipment industry; each direct job in the shipyards generates another job elsewhere in the economy, while for the marine equipment industry this is around one additional indirect job per two direct jobs;
- about half of the direct impact of the marine equipment industry has to be seen as the indirect effect of the European shipbuilding industry.

Taking into account these considerations, the total value of the European shipbuilding industry can be estimated (in terms of employment) between 750,000 and 800,000 persons. The total value added of the industry is estimated at € 32 to € 34 billion.

5.2.3. Key figures per country

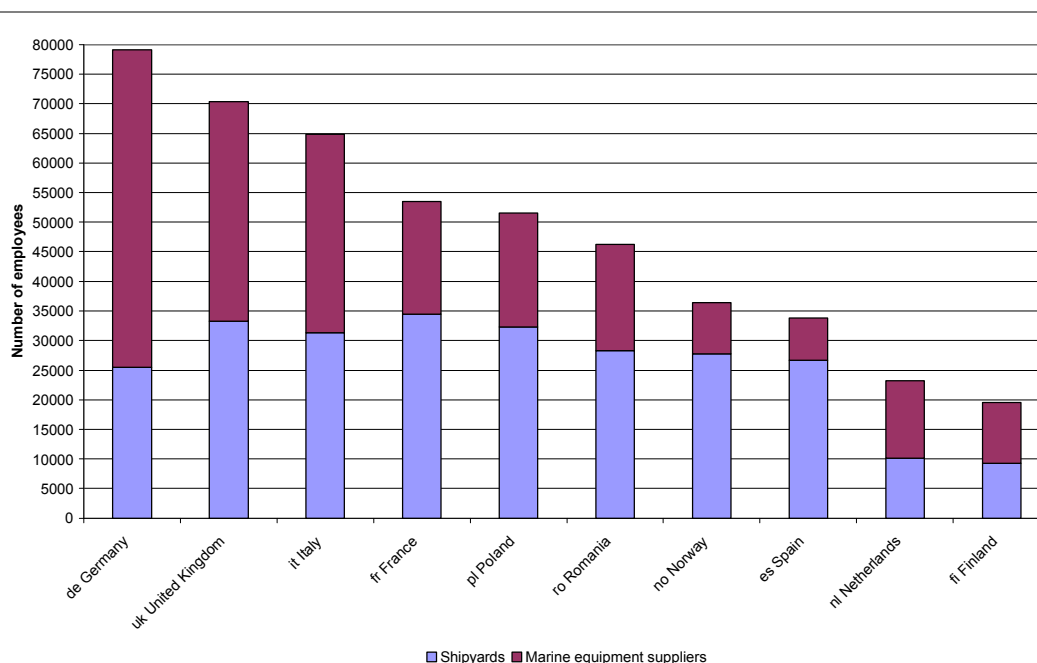
The numbers presented in the sections above, illustrate the economic importance of the total shipbuilding industry at European level. It is important to note that also naval shipbuilding is included in these figures. For a better insight, a more detailed view on the geographical distribution of the industry in Europe is given per country in the next section.

For the *shipyards* per country the top-10 countries employ about 90% of the total workforce. France is leading with nearly 12%, followed by the United Kingdom, Poland, Italy, Spain, Romania, Norway and Germany, in a range between 11.4 and 8.7%. The Netherlands and Finland employ 3.5% and 3.2% respectively, followed by Sweden, Denmark, Lithuania, Portugal and Greece which employ between 1 and 2% of the total of 293,000 persons. Countries which employ less than 1% are Latvia, Estonia, Belgium, Slovakia, Slovenia, Czech Republic, Ireland, Hungary, Austria and Cyprus.

The top-10 countries for the *marine equipment industry* are comparable to the shipbuilders' top-10. Spain is surpassed by Denmark and Greece and has a relatively weaker position in the marine equipment industry. Germany has by far the largest marine equipment industry representing more than 20% of the total employment. It is followed by the United Kingdom and Italy which account for 14.1% and 12.8% respectively. Poland, France and Romania account for about 7%. The following countries in line are the Netherlands, Denmark, Greece and Finland with shares varying from 5 to 4%. The top-10 marine equipment supplying countries together employ over 90% of the total workforce.

Figure 5.6 provides a comprehensive view on the direct employment in the shipbuilding industry as a whole.¹⁶⁰ Although shipyards represent most of the employment in every country, the top-3 countries – being Germany, the United Kingdom and Italy – have a relatively large share of employees in the marine equipment industry. The top 5 in terms of employment for the shipbuilding industry further consist of France and Poland. Poland and Romania are the two leading Central and Eastern Europe countries in this regard.

Figure 5.6: Distribution of employment of top-10 shipbuilding industry countries



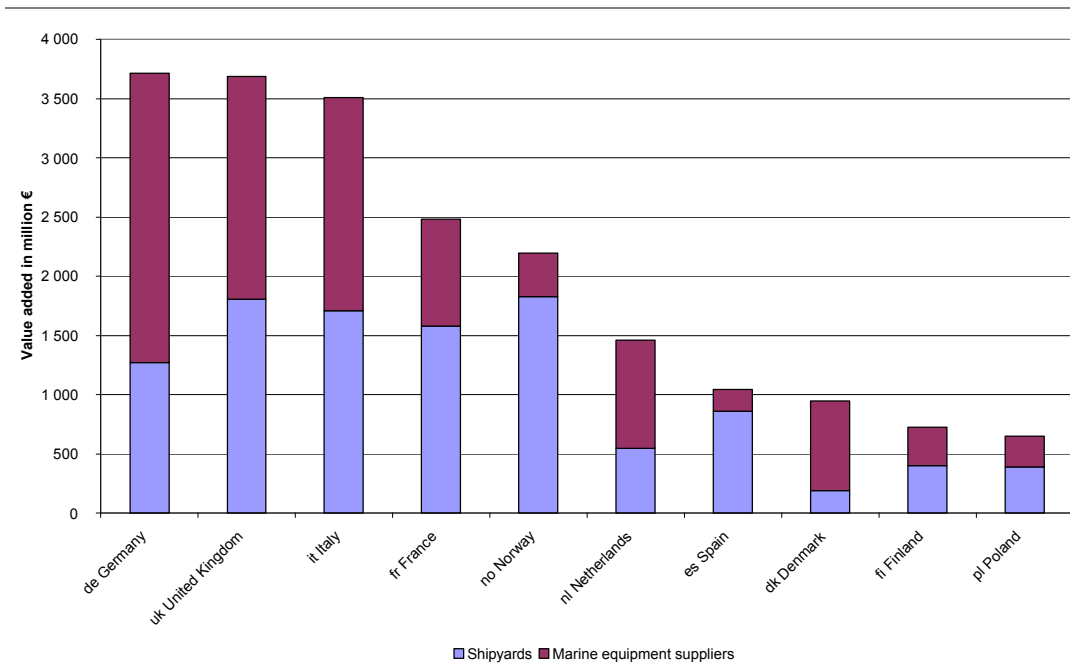
Note: naval shipbuilding is included.

Source: Policy Research Corporation based on Eurostat

Figure 5.7 on the next page shows the distribution of value added for the top-10 shipbuilding industry countries which for the four largest shipbuilding countries is in line with the order of the employment figures. It can be noted that countries such as Norway, the Netherlands and Denmark have a stronger position in terms of value added than in employment.

¹⁶⁰ The distribution on country level of the values for the marine equipment suppliers is based on the NACE figures. The nominal values are calculated through the total value added and employment presented in figure 5.4.

Figure 5.7: Distribution of value added of top-10 shipbuilding industry countries



Note: naval shipbuilding is included.

Source: Policy Research Corporation based on Eurostat

6. Scope and size of the knowledge leakages

Having discussed both the legal aspects in theory and in practice as well as the general economic outline of the European shipbuilding sector, this chapter looks into the scope, size and impact of the leakage of knowledge and innovation.

6.1. Measuring the leakages

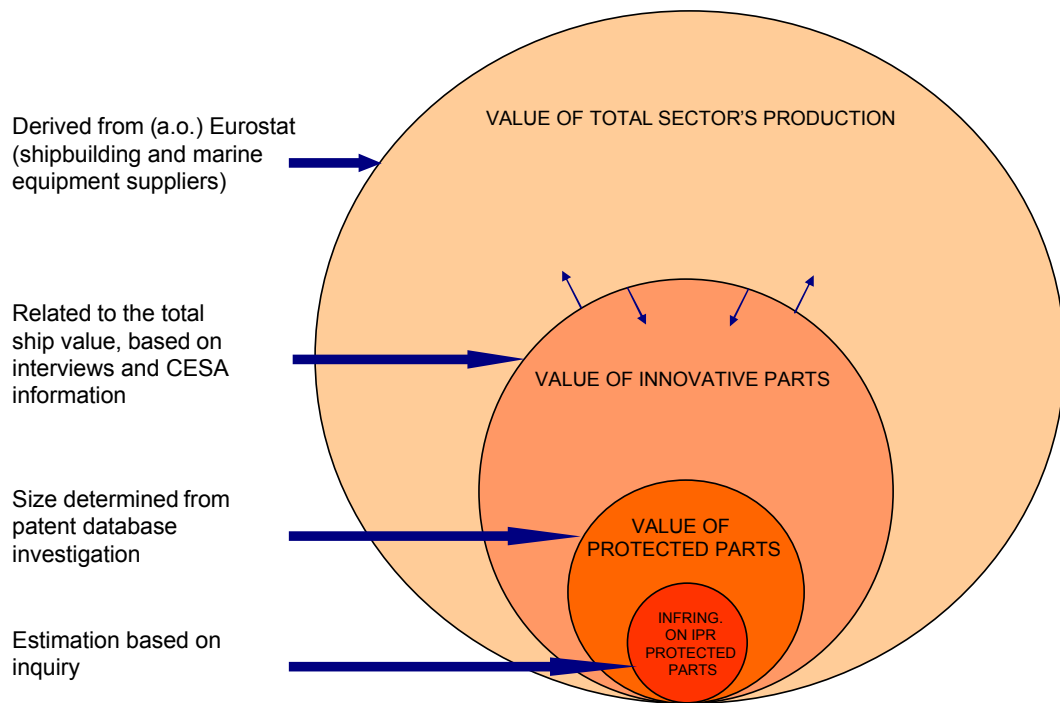
It should be noted at the outset that measuring the scope and size of knowledge leakage is challenging, as little reliable and objective information is available. Indeed, the companies concerned are themselves often not fully aware of leakages and infringements on their IPR, let alone of the value that such cases represent. It is therefore not possible to gather a comprehensive picture of all infringements cases, at least not within the scope of this project.

The assessment undertaken here is further complicated by the fact that the effects of infringements on individual companies may be life-threatening, while sector-wide this may not lead to a large effect. In this connection it should be stressed that even relatively small design, product or process innovations can have a very substantial economic effect on individual shipbuilders or marine equipment suppliers, in particular when such innovations distinguish the product from its competitors' in a way that is fundamental for the customers' decision to actually purchase the product concerned or not.

In order to create a clear understanding of the economic impact of IPR infringements, two different analyses have been performed. First, the *economic importance of innovations* is determined, which serves as a 'threshold' in between the total sector impact and the value of the infringements on the protected parts. Second, the *economic impact of IPR infringements* is measured.

The cascade of production value, the value of innovation and the value of (infringements of) IPR is visualised in *figure 6.1*. As a benchmark one could bear in mind that the larger patent-owning companies account for a 10 to 15% share of total employment in the shipbuilding industry.

Figure 6.1: Value cascade



Source: Policy Research Corporation

6.2. Value of innovations

In order to measure the total value of innovations for the shipbuilding industry, the cost breakdown of different ship types have been studied with the aim of classifying the (size of the) 'innovativeness' in the different ship parts and deriving benchmark figures. Of course, this way of splitting up a ship in more and less innovative parts is merely 'technical', as you either *sell* a ship with a certain intrinsic innovative character or you *do not sell* it. However, it allows to pinpoint the types of innovation at stake (and to be protected or defended in IPR terms) and to understand clearly where they originate from.

Table 6.1 on the next page illustrates an example of the average cost breakdown of several different types of ships (ferry, LNG carrier, container ship, product tanker and bulk carrier). Material costs represent the largest portion of costs; it includes the steel for the hull, the cargo handling and deck equipment, other major equipment, the propulsion and engines. Especially the propulsion and engines are rather innovative parts. The second largest part of costs concerns the labour input which includes the production but also the

design and technical engineering. Typically, the design and technical engineering will be the most innovative.

Table 6.1: Example of cost breakdown

Type of cost	Average cost	Average innovation value*
Material costs	About 68% (Between 60 and 70%)	Between 15 and 25%
Labour costs	About 24% (Between 15 and 30%)	Between 4 and 5%
Ship-specific financing costs	About 2% (Between 1 and 3%)	0%
Other direct costs	About 6% (Between 2 and 15%)	0%

Note: based on the value of the parts which are to be seen as innovative, yet the innovation can be allocated to either the yards or the marine equipment suppliers.

Source: CESA based on First Marine International Limited

As already indicated,¹⁶¹ the estimated value of innovation compared to the total ship value varies between 20 and 30%. The major part of this percentage is represented by the value of the propulsion and engines and specific parts. About 4 to 5% is represented by the design and engineering labour effort. The innovations, representing this value, are potentially protectable. However, not all these innovations are protected and therefore potentially at risk of being infringed in a legal sense. Consequently, the value of loss at risk can be determined. Nevertheless, it has been decided not to determine these variables into further detail. In particular, one should be aware that an innovative part with even a relative small value can be of substantial economic importance as it may trigger the buy or not-buy decision.

6.3. Value of IPR infringements

The leakage of knowledge from the European shipbuilding industry can definitely have serious economic consequences. Not without reason the feeling in the sector is that much is being copied, which substantially harms the industry, not only in the short run but specifically in the longer run.

¹⁶¹ See section 4.3 above.

From the research point of view this feeling is understood and it is agreed in a broad sense. However, when determining the value of IPR infringements in a strict sense it concerns the parts that are indeed protected by IPR. As many of the shipyards and marine equipment suppliers appear not to have use of IPR protection mechanisms to the maximum extent legally possible, the consequent value of IPR in the legal sense is somewhat limited, and the value of IPR infringements will only be a subpart of that which was visualised before in *figure 6.1*.

Therefore it is important to make a distinction between non-protected and protected products and processes. The value of copied *non-protected* products or processes is, economically speaking, lost. This can also result in a serious loss of market share. To keep or regain its market share, a company is forced to continuously put effort in innovation. On the other hand, the value of copied *protected* products or processes can – at least in theory – legally be secured.

The patent database research¹⁶² indicates that roughly half of the major European yards and marine equipment suppliers do not possess any patents. This makes it plausible that the number of patents held by the smaller companies will, in general, also be rather limited.

The inquiry amongst yards and equipment suppliers¹⁶³ has made it possible to determine the type of and the expected loss resulting from (detected) IPR infringements. The responses to the inquiry indicate that on average only a relatively limited percentage of the yards' turnover, a few percent at the most, is directly at risk due to IPR infringements.¹⁶⁴ However, this number should be interpreted with care. Firstly, the present study illustrates that by no means all IPR infringements will be detected and pursued by the companies concerned. Secondly, the indirect effect that the sector's position is undermined by the constant threat of 'leakage' of innovations may be of significant importance as well. Thirdly, on a company level, IPR infringements that represent a relatively limited direct financial loss may very well drive certain companies out of the market when the IPR infringed upon is crucial to their competitive position. The

¹⁶² See section 4.6 above.

¹⁶³ See in particular section 4.4 above.

¹⁶⁴ As indicated before, it is notoriously difficult to estimate the economic burden as leakages and infringements might often not even be noticed by the companies concerned. The calculation made here starts from the data provided by the firms participating in the Houthoff Buruma and Policy Research Corporation inquiry. As the sample comprises in particular the larger firms, the qualification "at most" in the sentence stipulates that for smaller firms one may expect this to be less than average. Nevertheless, for specific areas or companies, infringements and the burden thereof might be well be above this average.

value at stake rises considerably with these considerations, but the data availability is insufficient to determine this impact.

From the sector's point of view, the distinction between the unwanted use of ideas or products that *are*, and the unwanted use of ideas or products that *are not* (fully) protected through legal instruments is not always made; many in the industry consider both situations to be infringements. From a legal point of view, however, the use by third parties of knowledge and innovation that is not protected will normally not constitute an IPR infringement. Hence, from this viewpoint not much can be done against such use. Nevertheless, it is important to keep in mind that, economically speaking, also the non-protected knowledge and innovations are at stake. If more innovations, which currently are copied, were protected, the value of IPR infringements would be much higher. It is therefore worth noting that, notwithstanding the problems that exist with regard to the effectiveness and the enforceability thereof, IPR protection may not only open the scope for defence, but also that better organised control systems might be beneficial to detect unsolicited use of innovations.

6.4. Value of knowledge diffusion

Diffusion of knowledge as a result of leakage can have a negative impact on the results of the shipbuilding industry, which is frequently confronted with copies of their sometimes non-protected knowledge and innovations. Although legal measures could be taken to discourage these practises, realistically speaking it will be impossible to completely stop any such leakages.

The shipbuilding industry is not the only sector which is confronted with copied products. Instead of continuously putting energy in the counteracting of the leakages and infringements, other industries have turned this threat into an opportunity.¹⁶⁵ To the extent that it is not possible to totally protect one's knowledge, it may in some cases be better to search for ways to share and use available knowledge and innovations in the best possible way so that the cooperating parties can mutually benefit.

As has been stressed before, the value of an innovation can actually determine the value of a complete ship. Therefore it is important for shipyards to increase the innovativeness of the shipbuilding (both the process and product). In combination with a well-organised legal protection policy, the value of innovations can be increased by developing an active policy that not only stimulates the continuing creation of innovations, but that also

¹⁶⁵ See section 4.8 above.

improves the search in the market for useful knowledge and innovations. In other industries, these efforts have been successful.

The European shipbuilding industry has evolved to a specialised market player, specialising (*inter alia*) in building cruises, dredgers, naval and passengers' ships. To maintain and increase its market share, the shipbuilding industry should invest in the activities, in line with the LeaderSHIP 2015 efforts, which will keep the industry at least at the current innovative level. Cooperation in the field of R&D can be beneficial to all, but it requires a coherent European approach.

7. Other issues

This final chapter addresses three issues of a somewhat different nature that are of relevance for this study. Firstly, attention is paid to the possible limitations that follow from European competition law. Secondly, a brief comparison is made with related developments in other sectors of economic activity. Lastly, some important issues relating to safety, health and the environment will be discussed.

7.1. Competition law aspects

7.1.1. Limitations stemming from competition law

In the course of this study it has become clear that quite often companies in the shipbuilding sector refrain from establishing full and adequate IP protection, because of the high costs involved. One of the solutions to this problem could be closer cooperation by European companies in the fields of R&D and (collective) protection of intellectual property. In that way these companies can spread the costs related to these activities, thereby reducing the costs per company. Another, related manner to address these shortcomings is patent pooling.¹⁶⁶

However, such cooperation between (potentially) competing companies may also raise competition law issues. Article 81 (1) of the EC Treaty is in particular relevant.¹⁶⁷ This article prohibits, as a general rule, any form of agreement and other collusive behaviour between undertakings that appreciably restrict or are intended to restrict competition. It should be noted, however, that not all cooperation between undertakings is by definition caught by the prohibition of Article 81 (1) EC. The European competition rules contain some notable exceptions for situations where the cooperation is, in principle, caught by the general prohibition (see below).

Moreover, both Article 81 and Article 82 EC, which latter article prohibits in essence any abuse by one or more undertakings of a dominant position, can in practice limit the exercise of the IP right of a particular undertaking. The mere exercise of IP rights, however, will generally only be found to infringe these articles in rather exceptional circumstances. For that reason this latter aspect will not be further looked into here.

¹⁶⁶ The concept of patent pooling was explained in section 4.8 below.

¹⁶⁷ The present overview is limited to European competition law. Depending on the circumstances of the case at hand, national competition law may (also) apply. Generally speaking national competition law of the Members States of the EU tends to be in line with European competition law, although on some particular issues relevant differences may exist.

Giving a full and comprehensive analysis of all the relevant considerations of a competition law nature would exceed the scope of the present study. Nevertheless, an overview of the most important possibilities and limitations that exist has been attached as *Annex V* to this report.

7.1.2. Joint R&D agreements

While referring to that annex, it can be pointed out here that agreements on the joint execution of research work or the joint development of the results of the research, up to but not including the stage of industrial application, generally do not fall within the scope of Article 81 (1) EC. In other words, this article will normally not apply to agreements relating solely to a stage prior to commercial exploitation and having as their sole object the cooperation on pure R&D projects, nor to the placing of R&D contracts, typically with specialised companies or research institutes, which are not active in the exploitation of the results. Neither does the prohibition of Article 81 (1) EC in principle apply to R&D cooperation between non-competitors and to outsourcing agreements.

On the other hand, if an agreement for example entails that the parties will not carry out other R&D developments in the same field, thereby foregoing the opportunity of gaining competitive advantages over the other parties, such an agreement will normally be caught by the prohibition of Article 81 (1) EC. The same goes for other agreements that restrict innovation, access to the results of the R&D, the exploitation thereof, or agreements that serve in fact to facilitate disguised cartels.

Given that cooperation between undertakings in research and technological development may represent an essential tool in making Community industry internationally competitive, certain agreements falling under Article 81 (1) EC may be exempt. In this context the 'block exemption' Regulation 2659/2000 on the application of competition law to research and development agreements is of particular relevance. This Regulation basically exempts two types of agreements having as their main purpose the joint R&D: those for joint R&D and those for the exploitation of the results of R&D jointly carried out pursuant to a prior agreement between the same undertakings, provided that six threshold conditions are met (discussed further in the annex). One of these conditions is that the combined market share of the participating undertakings does not exceed 25% of the relevant market for the products capable of being improved or replaced by the contract products.

7.1.3. Technology transfer and patent pooling agreements

As will be discussed in further detail in *Annex V*, technology transfer agreements will usually be considered to improve economic efficiency and to be pro-competitive.¹⁶⁸ In particular, a technology transfer agreement will normally fall outside the scope of Article 81 (1) EC if it contains no provisions that restrict competition, when the restrictions are ancillary to the opening of new markets or when the agreement is of minor importance (i.e. between parties with an aggregate market share of below 10%). Technology transfer agreements that do fall under the scope of this article may be exempted under the block exemption Regulation 772/2004, provided that the agreement is limited to two parties, concerns the production of the contract products and is concluded between parties with a limited combined market share (of less than 20% in case of competing parties).

Patent pooling between actual or potential competitors may also raise issues related to European competition law in general and the restrictions that follow from Article 81 (1) EC in particular. It is important to distinguish between the various possible objects of a patent pool. Pooling technologies required to produce a product or to carry out the process to which the technologies relate (complementary technologies) shall usually fall outside the scope of Article 81 (1) EC, provided that the pool includes only essential technologies. Where non-essential but complementary patents are included in the pool there is a risk of foreclosure of third party technologies and the agreement is likely to be caught by Article 81 (1) where the pool has a significant position on any relevant market.

Pools of substitutable technologies generally infringe Article 81 (1) EC. It may not always be possible to satisfy the (rather strict) conditions for exemption, which include the requirements that the pool must be indispensable, open and non-exclusive, the pool must not extend to non-essential technologies and that the parties involved must not be prevented from creating or participating in alternative pools. Technology pools for the purpose of creating industry standards, on the other hand, are often pro-competitive. Even though such pooling agreements can infringe Article 81 (1) EC when the members have a strong collective market position and create difficult market entry conditions for third parties, they will usually be exempted if the pooled technologies are selected in an objective way and if they are non-exclusive.

¹⁶⁸ Given that such agreements can reduce duplication of R&D, strengthen the incentive for the initial R&D, spur incremental innovation, facilitate diffusion and generate product market competition.

7.2. Comparison with other sectors

Although there are, obviously, relevant differences between other sectors such as the automotive and aviation industry on the one hand and the shipbuilding industry on the other hand,¹⁶⁹ it is clear that the shipbuilding industry is not the only sector that has to cope with the leaking away of knowledge and innovations. Therefore it is worthwhile to look into other sectors to see whether lessons can be learned.

7.2.1. Similar problems in other sectors

Just as the European shipbuilding industry, *European car manufacturers* are confronted with numerous infringements on their IPR, especially regarding the copying of car parts and car models:¹⁷⁰

- Infringements of both trademarks and design rights constitute the majority of violations, originating in specific regions such as Asia (particularly China, Taiwan and Thailand), the Middle East, South America and Southern and Eastern Europe.¹⁷¹
- France's Anti-Counterfeit Agency estimates that up to one in ten car parts sold in Europe are fake and the Motor & Equipment Manufacturers Association (MEMA) conducted a survey indicating that the global automotive industry loses 12 billion dollars to counterfeiting.¹⁷²
- It appears to occur quite often in the automotive industry that a renegade authorised distributor who has been "helpful" to a trademark owner by registering the owner's trademarks in the local country, begins to import knock-off products at lower margins while "owning" the trademark registrations in the local country and hijacking the trademark from the rightful owner.¹⁷³

¹⁶⁹ For example, in the shipbuilding industry the scope for production in large series is smaller than in the automotive and the aviation industry (vessels are often produced on a tailor-made basis), the regulatory framework and the degree of state intervention differ, etc.

¹⁷⁰ For an illustrative list of products subject to IP infringement in the automotive industry, see the executive summary of the OECD report on 'The Economic Impact of Counterfeiting and Piracy', 2007, p. 12.

¹⁷¹ Article: *Protecting Intellectual Property*, see website ACEA (European Automobile Manufacturers Association).

¹⁷² See Fact sheet *The impact and scale of counterfeiting*, used during the First Global Congress on Combating Counterfeiting held on 25 and 26 May 2004 (www.anti-counterfeitcongress.org).

¹⁷³ M. Powelson, G. Li & E.J. Kelly, Getting the Black Market to Knock Off: Strategies to Enforce Trademark Rights in Asia, May 2006, p. 2.'

- In some instances the deficiencies of counterfeited parts seriously impaired the safety of the vehicles.¹⁷⁴ Daimler Chrysler has been held liable for an accident that was caused by a fake car part. Already being put on a considerable disadvantage by the copying itself, Daimler Chrysler even had to prove that it was not the producer of the car (part).

The problems of counterfeit and piracy likewise cause a lot of inconvenience in the *aircraft industry* and the *pharmaceutical sector*.¹⁷⁵

7.2.2. Action taken in other industries

A few of the measures that are being undertaken in other sectors:

- Just like the shipbuilding industry, the automotive industry has expressed serious concerns about the enforcement of IPR in some areas of the world, particularly in the Far East.¹⁷⁶ In its Communication on a Competitive Automotive Regulatory Framework for the 21st Century, the Commission promised to continue its policy of ensuring that IPRs are promoted and enforced globally through existing international agreements and to include comprehensive IP provisions in future bilateral agreements.¹⁷⁷
- Automobile companies such as General Motors, Honda Motors and Hyundai Motors are currently undergoing legal battles against Chinese companies for trademark violations.¹⁷⁸
- Together with many other international companies General Motors has formed a Global Brand Protection Team to monitor counterfeiting and other deceptive practices. The team coordinates its efforts with other car producers, parts manufacturers and other deceptive practices.

¹⁷⁴ Also see the OECD report on 'The Economic Impact of Counterfeiting and Piracy', 2007, p. 19.

¹⁷⁵ The World Health Organisation (WHO) estimates that counterfeit medicines account for 10% of all pharmaceuticals, with the number rising as high as 60% in developing countries. See Fact sheet *The impact and scale of counterfeiting*.

¹⁷⁶ See the Commission's position on the CARS 21 High Level Group Final Report A Contribution to the EU's Growth and Jobs Strategy, SEC (2007) 77 and 78.

¹⁷⁷ See section 3.4 of the Commission's position mentioned above.

¹⁷⁸ GM Daewoo's "Matiz" is a well-known case in which the entire exterior design of the car was copied, manufactured, advertised and sold under a different name by China's Chery Automobile Company. See the European Union Chamber of Commerce in Korea, *A growing concern: counterfeit auto parts*.

- The European Automobile Manufacturers Association (ACEA)¹⁷⁹ has opened representative offices in Tokyo and Beijing. These offices support and develop the common interests of ACEA members, closely coordinating with ACEA members' own representations in China and liaising with the Chinese authorities on automotive-related issues.
- The car industry uses modern technologies to identify genuine parts through encrypted markings.¹⁸⁰ The pharmaceutical industry also uses authentication technologies for pharmaceuticals, including colour shifting inks, holograms, finger prints or chemical markers embedded in a drug or its label, as an important part of an effective anti-counterfeiting strategy.¹⁸¹
- Some companies have chosen to withdraw their investments from countries with weak IP protection. The pharmaceutical company Novartis, for example, decided to stop investments in India after having lost a controversial patent case in that country. In a press statement, the company announced that it intends to invest only in countries with an adequate level of IP protection.¹⁸²
- The automotive sector also works through existing structures, such as the IPR helpdesk and the network of European Information Centers.¹⁸³
- The international aviation authorities¹⁸⁴ mandate a preventive measure that when an airplane part changes place a custodian authorised release certificate (ARC) must accompany it. This process became necessary as a result of the rise of counterfeit parts, which are of a lower quality and create a risk to the safety of the aircraft. Asset pedigree is becoming a vital aspect of any successful aircraft business.¹⁸⁵

Taking into account that the problem of technology leakages also affects other sectors, general policy measures may often be more appropriate than a piecemeal approach of introducing policy measures that only apply to the shipbuilding sector.

¹⁷⁹ GM, Scania, Peugeot, Citroën, Renault, Volkswagen, DAF, Volvo, Porsche, MAN, Daimler Chrysler and BMW are members of ACEA.

¹⁸⁰ Motor Magazine, Tom Nash, *Counterfeit Parts: A poor Fit for Your Shop*.

¹⁸¹ See U.S. Department of Health and Human Services, 'Combating Counterfeit Drugs – A Report of the Food and Drug Administration', published in February 2004, p. 3 (under b).

¹⁸² See "Novartis mijdt India na verlies patentzaak", in *Financieele Dagblad* of 23 August 2007.

¹⁸³ See Commission Working Document, COM 2006/631, Closer Partners, Growing Responsibilities – a Policy Paper of EU-China Trade and Investment.

¹⁸⁴ Including the European Aviation Safety Agency (EASA), Federal Aviation Administration (FAA), Transport Canada Civil Aviation (TCCA) and Australia's Civil Aviation Safety Authority (CASA).

¹⁸⁵ See Counterfeit.com, *New program to combat aircraft parts counterfeiting*.

7.3. Safety, health and environmental issues

Although not being a main theme of this study, counterfeit and piracy do not only pose a threat to the technological leadership of the European shipbuilding industry and will therefore have adverse economic consequences, but can also result in lower product quality and pose a serious threat to safety, health and environment.¹⁸⁶ The European shipbuilding industry has a very considerable development lead in, for example, environment-friendly innovations such as ballast water purification systems.

The Commission already acknowledges the importance of product safety and is – at least in the field of consumer protection – building partnerships with China and South Korea on a range of issues related to product safety, including enforcement, rapid alert systems and effective market surveillance.¹⁸⁷ Irrespective of the economic importance of the European shipbuilding industry, these safety, health and environmental issues in itself form a reason for policy measures to strengthen the protection of IPR in the shipbuilding sector and to design product safety and environmental monitoring and certification systems.¹⁸⁸ The use of copied products of inferior quality can indeed have very serious negative consequences for safety, health or the environment.

SANCO Commissioner Meglena Kuneva has recently signalled that China may face counter measures if there is no improvement of the product safety of products originating from China (with a threat of no access to the European markets as the ultimate weapon).¹⁸⁹ Those threats do seem to have at least some effect: the Chinese government has drawn up a black list of Chinese manufacturers that are not allowed to export anymore.

¹⁸⁶ The European shipbuilding industry has an enormous development lead in environment-friendly innovations (e.g. ballast water purification systems etc).

¹⁸⁷ In January 2006, the Commission and the Chinese government signed a Memorandum of Understanding with the objective of establishing better communication and collaboration on consumer product safety and to support Chinese authorities in their efforts to ensure product safety, in particular for consumer products exported to the EU.

¹⁸⁸ A Rapid Alert Systems is already in place for dangerous consumer products (RAPEX). The European Commission has presented the 'Third Maritime Safety Package' COM (2005) 0585 final of 23 November 2005) which includes legislative proposals with respect to Inspections and Survey Organisations, Investigation of Accidents and Civil Liability.

¹⁸⁹ See 'China zet makers onveilige producten op zwarte lijst', Financieele Dagblad of 6 August 2007.

Unequal standards (2004/2005)

A European marine equipment supplier invested considerably in the development of an innovative high-velocity valve. According to this supplier, this product was subsequently copied by an Asian supplier, possibly through reverse engineering. The European supplier got hold of the copied product, which had been approved by a class society, and decided to have it tested by a respected European testing body. However, it first replaced the name tag of the Asian supplier on the product by its own name tag.

The tests confirmed that the replica was of inferior quality and the product was not approved. The replica was then banned by the national authorities of the Member State concerned. After new tests had confirmed the earlier results, this national ban was upheld. Nevertheless, the replica can still be legally used onboard other European ships.

8. Conclusions and policy recommendations

Based on the foregoing, this chapter draws conclusions and formulates policy recommendations. These recommendations are primarily addressed to the European Commission, but also to the shipbuilding industry and other actors involved.

8.1. General

The European shipyards (as key organisers in the complex shipbuilding process) and the marine equipment suppliers (as producers of often innovative parts and complex integrated systems) have jointly demonstrated over the years that they are in many cases able to fight the competition through innovation. Besides product innovation, design and process innovation are the key driving forces behind the evolution of the shipbuilding industry.

This study reveals that even though especially the bigger players do use both the classical instruments of IP protection and contract clauses, a significant part of the innovations in the shipbuilding industry is not (fully) protected. This is, however, not primarily due to the substantive characteristics of the current legal framework on the national, European or international level. Though there is indeed room for improvement (e.g. the introduction of a Community patent), overall the legal framework is in itself not inadequate for the protection of IP. Rather, the suboptimal use of the existing possibilities of IP protection appears to be caused by a range of other issues, including enforcement difficulties, the costs of adequate protection, a lack of awareness in the industry and hesitations with regard to taking legal steps out of fear of harming business relations.

Clear examples of IPR infringements can be found, but are not abundant. The field research suggests that the direct economic impact of the (detected) IPR infringements amounts on average to a few percent of turnover at most. This number should be interpreted with care however. Firstly, the present study illustrates that by no means all IPR infringements will be detected and pursued by the companies concerned. Secondly, the indirect effect that the sector's position is undermined by the constant threat of 'leakage' of innovations may be of significant importance as well. Thirdly, on a company level, IPR infringements that represent a relatively limited direct financial loss may very well drive certain companies out of the market when the IPR infringed upon is crucial to their competitive position. The value at stake rises considerably with these considerations, but the data availability is insufficient to determine this impact.

Taking into account the relativity of the direct economic effects of the leaking away of technological knowledge and the fact that other sectors clearly struggle with similar problems, with a few notable exceptions there does not seem to be a justification for special legislative measures that exclusively apply to the shipbuilding industry. However, this is not to say that nothing can be – or indeed should be – done to support the European shipbuilding industry in this regard. On the contrary, the present study indicates that the industry could significantly benefit from a range of practical, well-targeted measures. The following ten policy recommendations could be considered in order to achieve a more effective protection of IPR. These recommendations will subsequently be discussed below:

- i. Diminish the burdens to obtaining IP protection;
- ii. Stimulate measures to share the burdens of innovation and protection;
- iii. Increase the IP awareness in the industry (in particular for SMEs);
- iv. Reinforce international cooperation and coordination;
- v. Consider amending Article 5ter Paris Convention;
- vi. Take specific customs and Port State Control measures;
- vii. Create a EU IP-Charter to manage public-private research cooperation;
- viii. Review the role of class societies;
- ix. Stimulate the use of methods to distinguish between original and fake;
- x. Consider open innovation as a complementary or an alternative concept.

8.2. Diminishing the burdens to obtaining IP protection

IP protection can be expensive and difficult to obtain. A more efficient IP protection could be achieved through the introduction of a Community patent, as it would allow individuals and companies to obtain a unitary patent throughout the European Union and reduce translation costs. The current European patent is merely a bundle of nationally enforceable patents in the designated states. This can be expensive for the patentee because enforcement must be carried out through national courts in individual countries, and for a third party because revocation cannot be accomplished centrally once the opposition period has expired.

Market players in the shipbuilding industry would undoubtedly be better off with a framework that does allow their inventions to be protected by national authorities in all countries of the European Union. This seems all the more important, since the research

shows that technological knowledge does not always leak away to the Far East, but also within the EU. Due attention should therefore be paid to the legitimate interests of the European shipbuilding industry when discussing the possible creation of a Community patent.

Other measures to diminish the administrative and financial burdens for obtaining IPR protection include:

- Stimulate (transitional) alternatives to the Community patent that reduce the costs of patent translation and litigation, such as the London Agreement and the European Patent Litigation Agreement (EPLA).
- Taking into account the advantages in terms of costs and (relative) simplicity, which may be of particular importance to SMEs, the Commission could consider (re)introducing a proposal aimed at creating a 'European' utility model.
- Since the costs involved are an important burden to adequate IP protection, a general lowering of the costs for IP protection would certainly form an important incentive for making better use of the existing instruments of IP protection.

8.3. Sharing the burdens to innovation and protection

Besides diminishing the existing burdens to effective IPR protection, manners to share these burdens should be considered. Often a better protection could be achieved through methods of cost-sharing. This could, in particular, be achieved through the following measures:

- Stimulating the conducting of joint R&D efforts, the sharing of (collective) IPR or the joint development of integrated design and manufacturing processes for complex ships. This is currently already being done through a variety of platforms involving a range of organisations.¹⁹⁰ Such initiatives deserve further support.
- Costs related to the protection of IP could also be shared between companies and (semi-)public institutions. Such measures¹⁹¹ could include reimbursing (part of) the costs of patent applications and IP enforcement actions in case of

¹⁹⁰ COREDES (Committee for Research and Development in European Shipbuilding), EMECrid (EMEC's working group focussing on Research, Development and Innovation), the Waterborne Technology Platform that establishes an industry-broad technology platform that benefits from numerous synergies and IP INTERSHIP, in which major European shipyards work together with suppliers, universities and research institutes. See CESA's Annual Report 2005-2006, p. 10, 17-19.

¹⁹¹ The measures referred to here will, of course, have to be consistent with the European framework for state aid.

infringements;¹⁹² awarding companies (SMEs) “innovation vouchers” that they can use to file (their first) IP registrations; or using special tax measures. The recent Community framework for state aid for research and development and innovation activities is in particular a positive development in this regard.¹⁹³

- An interesting possibility may be offered by setting up a central, European database for the protection of shipbuilding IPR to improve the chances of yards and suppliers to enforce their IPR at acceptable costs.¹⁹⁴ CESA has already finalised a detailed business plan for a collective management organisation to manage, monitor and enforce IPR for European yards.¹⁹⁵ This organisation will start focussing on the production of a European shipbuilding handbook, establishing standard shipbuilding IPR/confidentiality terms and conditions, developing a security system to control knowledge flows, building up an expert network, setting up a joint patent monitoring system and seeking a pilot case.¹⁹⁶ Once such a collective management organisation has matured, it could also contribute to solving the problem that IPR infringements are often left unpunished, because individual market players do not want to harm their business relations. Taking (legal) action may prove less sensitive if it is primarily taken by the collective management organisation instead of by the IPR holder concerned.¹⁹⁷ Such activities could be coordinated and stimulated by a taskforce, established under the wing of LeaderSHIP 2015.

¹⁹² This is done for SMEs in Austria through the *Austria Wirtschaftsservice* (AWS), which is the federal promotional bank of Austria, to promote Austrian SMEs to patent their technological innovations in China and other emerging markets by reimbursing up to fifty percent of patent applications and IP enforcement actions in case of infringements. See D. Friedmann, *loc. cit.*, 2007, p. 81.

¹⁹³ This Community framework for R&DI (2006/C 323/01) foresees that aid to SMEs for the costs associated with obtaining and validating IPR shall normally be compatible with the internal market within the meaning of Article 87 (3)(c) EC up to the same level of aid as would have qualified as R&D aid in respect of the research activities which first led to the IPR concerned.

¹⁹⁴ The situation in Japan might be able to serve as an example, where three industry wide projects on information exchange among shipping, shipbuilding and marine equipment companies can be identified. The “Senpaku CALS project” consists of a series of experiments for the purpose of establishing core technology for electronic exchange of technical information among shipbuilders, ship owners and ship classification societies. The “Senpaku EC project” and “Zohaku Web project” extend the scope of information exchange to data between shipbuilders and ship machinery/equipment suppliers. All projects cover a very substantial part of the Japanese maritime industry.

¹⁹⁵ Again it should be noted that such schemes should, of course, be in conformity with Community law in general and EC competition law in particular.

¹⁹⁶ See CESA’s Annual Report 2005-2006, p. 12 and CESA’s Annual Report 2006-2007, p. 31.

¹⁹⁷ This is possible under Article 4 of the Enforcement Directive.

8.4. Increase of awareness (in particular for SMEs)

As is the case in many other industries, not all market players in the shipbuilding industry (especially small and medium-sized enterprises) appear to have a sufficiently well-established culture for the protection of intellectual property. Although attention for this topic appears to be increasing, these parties are not always fully aware of the financial value of their knowledge and innovations, the possibilities to benefit from those immaterial assets (by using their IP in a strategic manner) and the existing possibilities to protect IP. In an era of rapid technological developments, the importance for a company to think in a businesslike way about its assets becomes more and more important. The protection possibilities may be larger than expected at first sight, especially if one takes into account less traditional means of protection of technological knowledge.

Therefore, all possible efforts should be made in order to reach the maximum level of awareness. Even for the many companies that have already taken measures, it can be important to be reminded of the challenges and the possible solutions. In line with the more general Commission approach¹⁹⁸ the following measures could be considered:

- Companies should endeavour to improve the ‘management’ of their intellectual property. Depending on the resources available, it can be beneficial for companies to appoint an employee responsible for managing the company’s IP; sometimes technology may simply not be protected, because it is unclear who is responsible for protection. Another step to stop leakages of the value of IP is to perform a royalty investigation to verify the royalty revenues.¹⁹⁹
- Companies should take measures to increase the awareness with regard to IP protection, e.g. by publishing internal guidelines.²⁰⁰ Given the importance as a leakage vehicle, special attention should be paid to the interaction between shipyards and marine equipment suppliers. Companies should also be careful not to spread confidential information in specialist magazines and trade shows to limit the risks of product piracy and industrial espionage.²⁰¹
- The Commission (and other authorities) should involve the shipbuilding companies and associations as much as possible in current and future measures to raise awareness, to better exploit existing instruments and to try to ensure that

¹⁹⁸ See e.g. the Commission’s Communication on Research and Innovation, COM (2005) 488 final/

¹⁹⁹ In practice, often a great percentage of royalties is not reported to the license holder (who, as a consequence, receives less revenue than he is entitled to).

²⁰⁰ Commission Working Document LeaderSHIP 2015 Progress Report (COM (2007) 220, Chapter 6.

²⁰¹ The fact that such measures should not be confined to dealing with the Far Eastern countries is underlined by the very significant percentage of knowledge leakages that takes place within Europe according to companies questioned as part of the inquiry.

all competitors play by the rules. Special attention could be given to SMEs. Examples are the organisation of a series of one-day seminars,²⁰² running information campaigns on IP protection²⁰³ and specific workshops and guidance sessions that could, for example, be organised by national Chambers of Commerce or other European or national institutions.²⁰⁴

- The Commission could in particular play a helpful role in stimulating the drafting of protocols or guidelines outlining under which conditions other organisations should be provided with internal data. Such protocols or guidelines could be drafted by the industry itself with the help of experts.²⁰⁵ Sector specific guidelines on the sharing of technological knowledge already exist in other countries, such as the United States.²⁰⁶
- Shipbuilding industry organisations such as CESA and EMEC can have – and already have²⁰⁷ – an important role by informing their members about IPR in general and updating them on relevant IPR issues. It would be desirable if industry organisations could also pursue other activities for their member companies (e.g. stimulate the legal transfer of technology; advise on the use of legal means to protect IP, assist in the drafting of the guidelines referred to above), possibly with the (financial) support of the Commission.²⁰⁸
- Companies should be aware of the IP-related risks involved in trading with and investing in countries in the Far East, such as China and South Korea. Especially SMEs²⁰⁹ tend to be not fully aware of potential leakage risks involved in, for

²⁰² Through DG Trade and the National Patent Offices.

²⁰³ E.g. including a special website dedicated to (the importance of) IP protection. Such a website can also be used to create a forum for European market participants to share their experiences with respect to IP protection and enforcement.

²⁰⁴ In the Netherlands, these sessions – that are being organised by OCNL (Dutch Patent Centre) – have become increasingly popular. Staff members of OCNL have also reported that some SMEs have little idea of how to use the enormous wealth of information that is available at the Patent Centre or how to patent their products (see ‘Niemand weet iets van patenten’, *Financieele Dagblad* of 8 June 2007).

²⁰⁵ Although there will be an important task for organisations such as CESA and EMEC to develop co-operative understandings between shipyards and suppliers, the European Commission can guide the setting up of such system. An additional advantage of a system that is set up by the industry itself is that it enhances the awareness of the importance of protecting intellectual property.

²⁰⁶ In the US, the National Infrastructure Protocols for Shipbuilding Partners and Suppliers (NIIP SPARS) have been set up. This American project, which involves big technology partners, shipyards and suppliers, serves as a thorough basis for controlled cooperation between shipbuilding partners and other market operators.

²⁰⁷ E.g. the IPR Working Group of CESA is a very useful body to exchange information on IPR protection.

²⁰⁸ Although competition law issues will also have to be taken into account in this respect. See *Annex V*.

²⁰⁹ Bigger companies tend to be aware of the risks and either choose to postpone investment or take specific protective measures (e.g. by employing Europeans in key managerial positions and making sure that employees in the country of investment only have access to some of the key information).

example, establishing a joint venture with a local partner.²¹⁰ Leakage risks can be diminished by being more careful in disclosing know-how to business partners in the Far East. Concrete measures could include locating R&D units only in countries with strong IP regimes or putting safeguards in place at R&D units.²¹¹ If technology is transferred, it may be advisable to licence that technology in order to increase the control over that technology and to generate royalty payments.

- The Commission could step up and expand the IP-related support it is currently providing to the European shipbuilding industry in dealing with the Far East. That support ranges from giving advice and providing training on registration and enforcement of IPRs,²¹² developing public-private partnerships with EU industry federations and others to improve the protection of IPR,²¹³ to establishing a special EU body that monitors the potential risks for western investors in the Far East and provides European companies with this information.²¹⁴ Further support could be given (e.g. by this EU monitoring body, preferably in cooperation with industry associations) with regard to the gathering of evidence against and blacklisting of IPR infringers in order to enhance the chances of successful IP litigation and to reduce the scope for IPR infringements in the Far East.
- As part of the measures to stimulate shipbuilding-innovation, an obligation to protect the results of government (co-)subsidised projects by IPR could be introduced, either at the European or at the national level. Recently the Dutch government has for example adopted a new Aid Scheme for Innovative

²¹⁰ The establishment of such joint ventures with foreign partners is often an important source of know-how to companies in the Far East. See D. Bennett, M. Hall, H. Jinsheng, K. Vaidya & W. Xing Ming, 'The reality of transferring technology to China: What has been learned after 15 years', IAMOT 2006, p. 6. See also D. Bennet's contribution to the seminar organised by the European Commission on Transfer of Technology to China on 29 November 2006.

²¹¹ See also Economist Intelligence Unit, 'The value of knowledge – European firms and the intellectual property challenge', 2007, p. 9 and 'An Unconventional Approach to Intellectual Property Protection: The Case of an Australian Firm Transferring Shipbuilding Technologies to China', Jai Press 2000, accessible through www.accessmylibrary.com.

²¹² Through the EU IPR Helpdesk and Innovation Relay Centres.

²¹³ See Communication of the Commission determining the priorities and optimising the use of resources in order to obtain the most effective results in terms of IPR enforcement in third countries (see MEMO/04/255 Brussels, 10 November 2004, EU strategy to enforce Intellectual Property Rights in third countries - facts and figures, What is in the Enforcement Strategy?).

²¹⁴ See Trade Commissioner Mandelson's recent report with respect to the European-Chinese relation in the field of trade and investment, "Future Opportunities and Challenges in EU-China Trade and Investment Relations 2006-2010" at http://ec.europa.eu/trade/issues/bilateral/countries/china/legis/index_en.htm. The establishment of such a 'risk watchdog' would also signal to the Chinese authorities that IPR-related problems have to be solved in order to attract European investors.

Shipbuilding, in which the protection of IP and know-how is an explicit requirement.²¹⁵

8.5. International cooperation and coordination

Part of the problem concerned lies in its global scope. Although the standards of IP protection are relatively high in the EU, that is not of any avail to European companies whose rights are infringed in third countries. Despite the implementation of many international IPR agreements (e.g. TRIPs) in their respective intellectual property laws, the enforcement of IPR protection in countries such as China and South Korea is not as effective as it should be. This poses serious problems for the European shipbuilding industry. It is therefore imperative to consider all possible measures to address these problems.

It is important to note that, of course, the EU (or any of its Member States) cannot unilaterally impose substantive or procedural changes to the legal framework applicable in other sovereign countries such as China and South Korea, let alone change the way that these rules are implemented in practice. The desired results will generally have to be obtained through international cooperation and coordination, with all the limitations and complications this may involve. The EU is already involved in many efforts aimed at raising the standards of IPR protection in the Far East. The European shipbuilding industry could contribute by continuing to provide sufficiently detailed input to the authorities involved in these efforts.

Apart from the measures mentioned above,²¹⁶ the following steps could be considered in order to improve the position of the European shipbuilding industry in those countries:

- The European Union and its Member States could consider providing assistance to emerging market governments to strengthen enforcement mechanisms and agencies, and continuing to exert political influence on these countries to safeguard the protection of IPR. The parties concerned are incited, insofar as possible, to intensify the existing processes and to take into account the particular challenges that the European shipbuilding industry faces.

²¹⁵ See IP/07/554 of 24 April 2007 'Maritime transport: Commission authorises an aid scheme for Dutch shipowners to promote innovation', and Aid Scheme for Innovative Shipbuilding of 19 April 2007, no. WJZ 7043864, Article 9 in conjunction with Article 33 Economic Affairs Framework Regulation (*EZ-Kaderregelung*).

²¹⁶ See in particular section 8.4 above.

- a. In its Enforcement Strategy,²¹⁷ the Commission explicitly mentions IPR mechanisms in multilateral (including TRIPs), bi-regional and bilateral agreement. This includes: raising enforcement concerns in the framework of these agreements more systematically, consulting trading partners with the aim of launching an initiative in the WTO TRIPs Council, sounding the alarm on the growing dimension of the problem, identifying the causes, proposing solutions and strengthening IPR enforcement clauses in bilateral agreements.
- b. The EU has concluded several agreements with China, such as the Customs Cooperation Agreement, which provides for reinforced EU-China cooperation, IPR controls and supply chain security, and there have been recent negotiations with Korea on a Free Trade Agreement.²¹⁸
- c. Patent infringements by companies in China and other emerging markets are a heated issue in bilateral and multilateral trade discussions.²¹⁹ In this year's EU-China Joint Trade Ministerial, Trade Commissioner Mandelson for example urged his Chinese counterpart to protect EU businesses against intellectual property theft.²²⁰ More recently, he has sought a mandate from all Member States to join the proposed Anti-Counterfeiting Trade Agreement (ACTA) aimed at curbing the piracy and counterfeiting of consumer goods around the world. The initial "leadership group" also includes the US, Japan, South Korea, New Zealand, Mexico and Switzerland.
- d. Some Member States have also engaged in cooperation agreements with countries in the Far East aimed at a better protection and enforcement of IPR.²²¹

²¹⁷ Communication of the Commission determining the priorities and optimising the use of resources in order to obtain the most effective results in terms of IPR enforcement in third countries (see MEMO/04/255 Brussels, 10 November 2004, EU strategy to enforce Intellectual Property Rights in third countries - facts and figures, What is in the Enforcement Strategy?).

²¹⁸ Commission Working Document LeaderSHIP 2015 Progress Report, COM (2007) 220, Chapter 7.

²¹⁹ Also see Economist Intelligence Unit, 'The value of knowledge – European firms and the intellectual property challenge', 2007, p. 3.

²²⁰ See MEMO/07/237, *EU-China Trade Ministerial Meeting of 12 June 2007*.

²²¹ In October 2006, for example, the Dutch government and China agreed to collaborate to achieve a better protection of IP and to increase the awareness of Chinese companies in that field.

- e. Fundamental IP issues, such as the patent approval criteria and the workability of the global IP system, should be continuously addressed on the global level (e.g. in a WIPO and WTO context).²²²
- The European Union could consider establishing a joint consultative body with the governments of China and South Korea in particular to ensure that technology is not being copied without prior consent. Apart from exchanging officials and expertise, it could be useful to develop a specific information system through which the EU and these governments can exchange information to avoid counterfeit and to close down production of counterfeited products.²²³
- Having regard to the substantial number of organisations that are involved in the combat against counterfeit and piracy on the national, European and international level, it may be worthwhile to improve the exchange of information and the coordination between the different institutions involved in the different aspects of IPR enforcement²²⁴ in order to ensure effective enforcement.²²⁵
- Other problems related to IPR infringements, such as safety and environmental issues, could also be addressed through cooperation with the governments concerned, e.g. by educating local manufacturers about the European safety requirements and making European safety requirements easily accessible. Furthermore, the European Commission could have a (supporting) role in the identification of possible manufacturers of infringing, dangerous products found on the European market and passing on this information to national authorities for follow-up action.

²²² See also Economist Intelligence Unit, 'The value of knowledge – European firms and the intellectual property challenge', 2007, p. 17.

²²³ See the Communication from the Commission to the Council, the European Parliament and the European Economic and Social Committee on a Customs response to latest trends in Counterfeiting and piracy of 11 November 2005, COM(2005) 479 final, p. 13-15.

²²⁴ In particular the most involved international enforcement bodies such as the World Customs Organisation (WCO), Europol and Interpol. See the Communication from the Commission to the Council, the European Parliament and the European Economic and Social Committee on a Customs response to latest trends in Counterfeiting and piracy of 11 November 2005, COM(2005) 479 final, p. 13-15.

²²⁵ See the Enforcement Strategy of the Commission (MEMO/04/255 Brussels, 10 November 2004, EU strategy to enforce Intellectual Property Rights in third countries - facts and figures, What is in the Enforcement Strategy?). Close cooperation can also be used to both pick up international trends (by establishing a common approach to collect enforcement data) and to help spread the EU's practical approach to a broader audience.

8.6. Consider amending Article 5ter Paris Convention

Article 5ter Paris Convention poses an important burden to protection, because this provision results in European patent holders often not being able to take action if foreign vessels infringe on their patent rights. Although the European Union could consider to (try to) negotiate a stronger position in the Treaty for patent holders,²²⁶ this will undoubtedly be very challenging in practice since the EU cannot unilaterally amend an international convention. Apart from the difficulties involved in amending an international Treaty, there is also an important downside to an amendment of Article 5ter Paris Convention which will have to be taken into account carefully (see below).

Being able to use the threat of litigation would undoubtedly form a great boost for the protection of IP of the European shipbuilding industry.²²⁷ If the pure presence of counterfeit or piracy constituted a patent infringement in all circumstances (regardless of whether a vessel is only temporarily in a European country), that would – in all European countries – also imply that criminal measures can be taken against the patent infringer.²²⁸ This makes it likely that the industry, in that respect, would benefit from an amendment of Article 5ter Paris Convention.

On the other hand, an amendment of Article 5ter Paris Convention can also adversely affect European shipowners and shipbuilders, since that would imply that they could also be confronted with seizure of their non-protected ships or products in foreign ports. It is by no means inconceivable that, for example, a Chinese company would take advantage of the amended Article 5ter to sue a European shipowner or other company for patent infringement when visiting a Chinese port. There are reports of Chinese companies suing European (or other Western) competitors more aggressively in China, particularly in cases where the Chinese company has been able to obtain IP protection in China (even

²²⁶ Article 18 Paris Convention provides for the possibility of revision of Articles 1-12 and 18-30 of the Convention.

²²⁷ European IP holders will probably be reluctant to use drastic measures such as seizure if they are not sufficiently sure that their IPR have indeed been infringed, since they can be held liable for the costs of a wrongful seizure.

²²⁸ Article 61 TRIPs also obliges Members to “(...) provide for criminal procedures and penalties to be applied at least in cases of wilful trademark counterfeiting or copyright piracy on a commercial scale. (...)”. These measures will be harmonised if the proposed Directive on Criminal Measures Aimed at Ensuring the Enforcement of Intellectual Property and strengthening criminal measures to combat counterfeiting (COM (2005) 276 final) will be adopted by the Council.

though the European company may be the undisputed holder of those rights in Europe).²²⁹

All in all it is submitted that the possible amendment of Article 5ter Paris Convention should be on the European agenda, given the serious problems it poses to European shipbuilders whose technological knowledge has been copied. The topic deserves further consideration paying due regard to both the potential advantages and disadvantages of such an amendment as well as to the scope for amendment in practice.

8.7. Action by Customs authorities and Port State Control

The Anti-Piracy Regulation provides for powers to take action when custom authorities encounter counterfeit or piracy.²³⁰ Instructing the customs and Port State Control authorities to closely monitor the ships that arrive at the European ports and to make them more aware of the problem of counterfeit in the shipbuilding and equipment industry would undoubtedly contribute to the safeguarding of the interests of the European shipbuilding industry. From the industry's point of view such measures are to be encouraged.

Practically speaking it will probably not be feasible to fully inspect every ship entering a European harbour on illegally copied products, if only because it will often be extremely difficult to distinguish original products from (good) copies and because the costs and delays involved would be very substantial. In practice there will be more scope for targeted measures. In order to achieve an effective and goal-oriented combat against counterfeit and piracy, it is indispensable that the IP holder provides the relevant authorities with factual information that is as specific and detailed as possible, and that it pursues the case which may arise as a consequence whenever expedient. The role of customs could be reinforced by a closer coordination between the various (EU and national) Customs and Port State Control authorities. In order to facilitate the exchange of information between IP holders and the relevant authorities, the Commission could consider establishing an effective reporting system – preferably including low-threshold contact points so that market players know where to report their suspicions of counterfeit.

The effectiveness of customs cooperation could be further reinforced by cooperation with customs authorities in third countries and by sending customs officials to key production

²²⁹ Article 5ter Paris Convention does not apply exclusively to the shipping sector. The effect of a possible amendment as described here could therefore also be felt by, in particular, the aviation industry. This aspect also deserves further consideration.

²³⁰ Although Article 5ter of the Paris Convention may pose a burden to action (see section 8.6 above).

regions from a shipbuilding point of view.²³¹ In that way, the problem of counterfeit and piracy can be taken on at the source as much as possible.

8.8. EU IP Charter to manage public-private research cooperation

Although universities and research centres are not amongst the most important leakage channels, it is certainly recommendable to pay attention to the possibility of losing technological knowledge through this channel. In particular there is a certain tension between academia and businesses in the sense that universities and research centres are usually focussed on a rapid publication of research results, whereas the industry benefits from the confidentiality of inventions until patent protection has been obtained.

In this connection the '*IP Charter for universities and research centres*' that was proposed by the German EU Council Presidency in April 2007 as well as the Commission's work on this topic, are to be welcomed in particular.²³² It is expected that these initiatives will help put a stop to the uncontrolled outflow of knowledge and will help boost European competitiveness, because it will initiate a process of awareness-raising on the importance of better IP management and promote a better understanding of research partners' positions. A common approach to IP management would also ensure that research partners from Europe are in a better position to negotiate contracts with international partners.²³³

8.9. Reviewing the role of classification societies

Classification societies play a crucial role in worldwide shipping by guaranteeing that all relevant safety requirements have been complied with.²³⁴ That classification societies need to receive technological information in order to perform this important task is

²³¹ See the Communication from the Commission to the Council, the European Parliament and the European Economic and Social Committee on a Customs response to latest trends in counterfeiting and piracy of 11 November 2005, COM(2005) 479 final, p. 13-15, where it becomes clear that the Commission envisages Customs Agreements with countries such as India, Japan, members of ASEAN15, Mercosur and Pakistan.

²³² See the Commission's Communication on improving knowledge transfer between research institutions and industry across Europe, COM (2007) 182 final. A variety of national and supra-national tools already exist to help universities and other public research establishments to better manage their knowledge. These tools include the UK Lambert Agreements, the Responsible Partnering Initiative, and European Commission guidelines. Meanwhile, collaborative research under the EU Framework Programme is governed by rules of participation, which provides an IP framework for the project partners.

²³³ The proposal is published on [http://www.bmbf.de/pub/Eckpunkte_IP_eng\(2\).pdf](http://www.bmbf.de/pub/Eckpunkte_IP_eng(2).pdf).

²³⁴ Classification societies can also play an important role as knowledge providers.

undisputed. However, this can, of course, be no justification for infringing the IPR of European shipyards and marine equipment suppliers. This study indicates that the possibility of at least some leakages through that channel can certainly not be excluded.

In the interest of all parties concerned, it is necessary to strike a balance between the obvious need of classification societies to receive adequate information on the one hand and the justified IP-related concerns of the shipbuilding industry on the other hand. A range of measures could be considered:

- Ideally, safety checks should be carried out by independent bodies that do not engage in consultancy as well. A parallel could be drawn with the aircraft industry, where planes are checked by IATA. In the automotive industry it has been proposed to introduce safety requirements or a testing procedure on the European level in order to ensure that copied parts provide an equal degree of protection in impact situations to those produced legitimately by manufacturers.²³⁵ Such a European framework or institutional agency could, also in the shipbuilding industry, ensure a fair and equal assessment of new vessels or products without the risk of information being leaked.²³⁶
- Ships and pieces of equipment are normally inspected by several classification societies. If the number of inspecting entities could be limited to only one, the risk of information leakage is likely to diminish accordingly (since sensitive technological knowledge would then only come to the knowledge of a smaller circle of people and organisations). On the European level there is already a clear development visible towards mutual recognition, which implies inspections by fewer entities.²³⁷ From the viewpoint of the IP protection in the European shipbuilding industry, this development is to be encouraged strongly.

²³⁵ See an article on the website of ACEA, *Protecting Intellectual Property*, 1 April 2007.

²³⁶ This could also help to address the concerns expressed by the industry that some classification societies do not sufficiently verify that (especially the smaller and/or less visible) products that are tested, certified and actually installed onboard a ship are indeed one and the same product. To the extent that this is not sufficiently assured at present, this may not only harm fair competition but could also lead to health and safety risks. There are reports that the current procedures are sensitive to fraud. Furthermore, assigning to this authority the task of ensuring that the products tested have been produced in conformity with IPR could be another option that is worth considering.

²³⁷ The Marine Equipment Directive (96/98/EC as amended) ensures that the equipment on ships under EU flag is certified according to a harmonised system based on mutual recognition. Moreover, in 2005 the European Commission has proposed to introduce the principle of mutual recognition of the certificates issued by recognised organisations (classification societies), which is part of the Third Maritime Safety Package. See the proposal for a Directive on common rules and standards for ship inspection and survey organisations and for the relevant activities of maritime administrations, COM (2005) 587 final of 23 November 2005.

- Rules ensuring the confidentiality of sensitive information could be included in the regulatory framework applying to classification societies.²³⁸ The respect for such rules could also be part of the regular assessment of the functioning of the societies that are already undertaken at present. The “Chinese walls” that classification societies may currently have in place between the society’s regulatory tasks on the one hand and its consultancy work on the other hand are difficult to enforce as an outsider; many in the shipbuilding industry have serious doubts as to whether it can be certain that the present rules and structures safeguard their interests in a sufficient manner and that the rules are applied consistently. More transparency could address these concerns. The consequences of such rules should be very limited for classification societies that do respect the intellectual property of the yards and the equipment suppliers. A clear set of rules can also contribute to a better understanding by all the parties concerned to which extent technical information should be disclosed and how the necessary disclosure can be best combined with respect for the IPR of the yard or the equipment supplier concerned.
- Shipbuilders and marine equipment suppliers should be critical about the contracts they sign with classification societies and the information that they disclose. Well-drafted confidentiality clauses and more comprehensive agreements on classification societies’ control regarding IPR should help to address the existing concerns at least to some extent.²³⁹

8.10. Use of identification methods to distinguish between original and fake

An important problem when enforcing IPR is the evidentiary burden of proof. In IP litigation, the IP holder will have to prove that the other party has infringed on his IP rights, which can be rather difficult in practice. In the car industry use is being made of modern technologies to identify genuine from fake car parts (usually by encoding symbols in the materials used). Especially for expensive parts, it would be worthwhile to use such identification systems in the shipbuilding sector as well. The Commission could play a role in stimulation the use of such systems in the shipbuilding sector, also with an eye on the potentially disastrous consequences of the use of copied, inferior maritime products (such as spare parts).

²³⁸ See e.g. Amendment 69 of the European Parliament to the Commission proposal (see previous footnote), adopted in first reading on 25 April 2007 (A6-0070/2007).

²³⁹ It has been noted before that especially smaller companies may lack the bargaining power vis-à-vis the classification societies to agree on such contract clauses. Raising awareness may nevertheless, at the very least, come some way to address this issue.

Less sophisticated ways of identifying counterfeit from genuine – such as the use of specific trademarks, company symbols and designing – can also prove helpful in facilitating the authentication and/or detection of genuine versus fake goods. Trademarks and symbols can, however, be copied more easily by counterfeiters and pirates than advanced encoding. Nevertheless, the use of protected trademarks can have the important advantage that the victim of counterfeit can also take action on the basis of trademark law.²⁴⁰

8.11. Open innovation as a complementary or an alternative concept

In addition to the foregoing, both the Commission and the industry should also consider other means to cope with the fast evolution of innovations and try (whenever possible) to share knowledge within Europe as effectively and efficiently as possible. From an 'open innovation' point of view, the emphasis lies on sharing knowledge and innovations in a constructive way. This can result in better economic performance because of increasing market share and increasing profits. In many European countries shipbuilding and other industries are already moving in this direction through a variety of initiatives, such as the organisation of patent pooling and patent auctions. For example, selling patents that are valuable but not directly of use to the owner himself, does not only benefit the owner (who receives a return for the R&D expenditures through royalties), but also offers the additional advantage that unused technology is being developed further and more rapidly than otherwise would have been the case. In that way, the innovation processes can be accelerated through mutual gain. This will benefit the industry as a whole and therefore deserves further support.

²⁴⁰ Which has the additional advantage that the problems related to Article 5ter Paris Convention (see section 8.6 above) are evaded, because this article only applies to patent law and not to trademark law.

LIST OF ANNEXES

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Annex I: Questionnaire

1. What product does your company produce?

- Hull
- Propulsion & power systems
- Steering equipment
- Stability system
- Deck equipment
- Other
-
- Central commanding
- Pipework, pumps, compressors
- Navigation
- Loading and unloading system
- Interior construction

2. Is your company confronted with a leaking away of technological knowledge?

- Yes
- No

3. If yes, how did the technological knowledge leak away?

- Through shipyards
- Through classification societies
- Through suppliers
- Through universities and research centres
- Through other ways, namely
-

Please provide us with an example (if possible)

.....
.....

4. If yes, does most technological knowledge leak away:

- Within the EU
- To the Far East (e.g. China, South Korea)
- To other parts of the world, namely
-

5. How many cases of leakage of technological knowledge did you experience in the last five years?

- 1
- 2-3
- 4-5
- 5-10
- 10-30
- 30-100

6. What was the estimated loss of profit (or damage) as a result of the leakage of technological knowledge?

.....
.....

7. Did your company take any measures to end the leakage of technological knowledge?

Yes No

If yes, which measures did you take?

.....
.....

8. Does your company generally protect its technological knowledge?

Yes No

9. If yes, how does your company protect its technological knowledge?

- Via patent law Via trademark law
- Via design law Via law of unfair competition
- Via intellectual property rights protection clauses in our contracts

10. If no, for what reason(s) does your company not protect its technological knowledge?

- We are not fully aware of the possibilities of how to protect our knowledge
- It causes an administrative burden
- The benefits of protecting our knowledge do not outweigh the costs
- Even if we protect our knowledge, there is still a problem of enforcement
- We do not want to harm the business relations
- Other, namely

.....

11. May we contact you for further questions regarding our investigation if necessary?

Yes No

If yes, please correct and/or complete contact details on the next page.

Annex II: List of major European yards and suppliers

Shipyards

3M Maj Shipyard	Croatia
A&P Birkenhead	United Kingdom
Aker Finnyards	Finland
Aker MTW Werft	Germany
Aker Warnemünde Operations	Germany
Aker Yards France	France
Akeryards	Norway
Astillero La Naval	Spain
BAE	United Kingdom
Blohm + Voss	Germany
Brodosplit Naval & Special Vessel Shipyard	Croatia
Brodosplit Shipyard	Croatia
Brodotrogir Shipyard	Croatia
Cantiere del Mediterraneo	Italy
Cantiere Navale De Poli	Italy
Cantiere Navale	Italy
Cassens Werft GmbH	Germany
Chantier Piriou	France
Conoship International	Netherlands
Damen Shipyards Group	Netherlands
DCNS	France
Elefsis Shipyards	Greece
Estaleiros Navais de Viana do Castelo	Portugal
Fincantieri Cantiere	Italy
Flensburger Schiffbau-Gesellschaft	Germany
Gdanska Stocznia Remontowa im. Pilsudskiego	Poland
Hellenic Shipyards	Greece
Howaldtswerke-Deutsche Werft	Germany
Husumer Dock- und Reparatur	Germany
IHC Holland	Netherlands
J.J. Sietas KG Schiffswerft	Germany
Keppel Verolme	Netherlands
Lisnave, Estaleiros Navais	Portugal
Lloyd Werft Bremerhaven	Germany
Meyer Werft	Germany
Navantia Astillero Cartagena	Spain
Navantia Astillero San Fernando-Puerto Real	Spain
Niestern Sander	Netherlands
Nordseewerke GmbH	Germany
Odense Steel Shipyards	Denmark
S.C. Aker Shipyards Braila	Romania
S.C. Aker Shipyards Tulcea	Romania
S.C. Damen Shipyards Galati	Romania
S.C. Santierul Naval	Romania
Scheepswerf Ferus Smit	Netherlands
Scheepswerf Peters	Netherlands
Stocznia Gdansk	Poland

Stocznia Gdynia	Poland
Stocznia Pólnocna	Poland
Stocznia Remontowa Nauta	Poland
Stocznia Szczecinska Nowa	Poland
Szczecinska Stocznia Remontowa Gryfia	Poland
Turku Repair Yard	Finland
Uljanik Shipyard	Croatia
Volharding Shipyards	Netherlands
Volkswerft Stralsund	Germany

Marine equipment suppliers

Aalborg Industries	Denmark
ABB	Sweden
ABC	Belgium
Akzo Nobel industrial paints	Netherlands
Alewijnse	Netherlands
Alfa Laval	Sweden
Alfing Kessler	Germany
Allen Gears	United Kingdom
Allweiler	Germany
Ameron	Netherlands
Amot	United Kingdom
Atlas Copco	Belgium
ASI Robicon	Italy
Autronica	Norway
Bakker Sliedrecht Electro Industrie	Netherlands
Becker Marine Systems	Germany
Beele	Netherlands
Bloksma	Netherlands
Bohler	Austria
Boll + Kirch	Germany
Bornemann	Germany
Bosch Rexroth	Germany
BP Marine	United Kingdom
Brunvoll	Norway
Cargotec Corporation (incl. MacGregor)	Finland
Caterpillar MaK	Germany
C-Map	Norway
Converteam	France
Croon	Netherlands
Damcos	Denmark
Danfoss	Denmark
Daros	Sweden
Deerberg	Germany
Deltamarine	Finland
Dose	Germany
Elomatic	Finland
Evac	Finland
Exxon Mobil Marine	United Kingdom
Fassmer	Germany

Fläkt
Garbarino
Geislinger
Goltens
Grenco
Hamworthy
Hatlapa
Heinzmann
Hempel
HMS
Hoerbiger
HRP
HSV
ICH
Imtech
Inmarsat
Jotun
Kaefer
Kelvin Hughes
Kone
Kongsberg Maritime
Kral
Kumera
Leistritz
Leutert
Liebherr
Loipart
Mahle
MAN
Marin
MCI
McMurdo
Mecklenburger Metalguss (MMG)
Miba
MTU
Muehlhan
Navalimpianti
Neuenfelder
NK-Neuenhauser
Norac
Noske Kaeser
Novenco
OMT
Palfinger
Pielstick (now MAN)
Piening
Pleiger
Pres-Vac
Radio Holland
Raytheon Anschutz
Reintjes

Sweden
Italy
Austria
Norway
Netherlands
United Kingdom
Germany
Germany
Denmark
France
Austria
Netherlands
Germany
Netherlands
Netherlands
United Kingdom
Norway
Germany
United Kingdom
Finland
Norway
Austria
Norway
Germany
Germany
Switzerland
Finland
Germany
Germany
Netherlands
Denmark
United Kingdom
Germany
Austria
Germany
Germany
Italy
Germany
Germany
Norway
Germany
Denmark
Italy
Austria
France
Germany
Germany
Denmark
Netherlands
Germany
Germany

Renk	Germany
Rizzio Valvole	Italy
Rolls-Royce	United Kingdom
Rockwell Automation	Italy
Roxtec	Sweden
Saab Trasponders	Sweden
SAM Electronics	Germany
Sauer & Sohn	Germany
Scan Rope	Norway
Schelde	Netherlands
Scheuerle	Germany
Schindler	Italy
Schottel	Germany
Siemens	Germany
SigmaKalon	Netherlands
Simrad	United Kingdom
Sperre	Norway
SSAB	Sweden
Stromag	Germany
Teufelberger	Austria
Telenor	Norway
Thales Naval Systems	France
Thermax	Austria
Thrane & Thrane	Denmark
Total Marine	France
TNO	Netherlands
Transas	United Kingdom
TurboNed	Netherlands
Ulstein	Norway
Umoe Schatt Harding	Norway
VAF	Netherlands
VA Tech Escher Wyss	Germany
Viking	Denmark
Voith	Germany
Vulkan	Germany
Wärtsilä	Finland
Wildenauer	Germany
Woodward	Netherlands
Xantic	Netherlands
ZF	Germany
Zollern	Germany

Annex III: List of contacted companies and persons²⁴¹

Aalborg Industries	<i>Kim Sørensen</i>
Aker Yards	<i>Eero Mäkinen*</i>
BAE Systems	<i>John MacLean</i>
Bakker Sliedrecht	<i>Gert den Dunnen</i>
Beele Engineering	<i>Hans Beele</i>
CESA	<i>Reinhard Lüken*, Jing Shen*</i>
Damen shipyards	<i>Jan-Wim Dekker, Peter van Terwisga</i>
EMEC	<i>Paola Lancellotti, John Kuehmayer</i>
Ficantieri	<i>Piero Boico*</i>
HME	<i>Martin Bloem, Gert-Jan Huisink</i>
Howaldtswerke-Deutsche Werft	<i>Ulf Kopf*</i>
IHC	<i>Fred Brouwer, Jaco van der Hoeven*</i>
Lloyd's register	<i>Flans Kemp</i>
Marin	<i>Henk Prins</i>
Meyer Werft	<i>Thomas Witolla*</i>
NML	<i>Niko Wijnolst</i>
Padmos	<i>Johannis Padmos</i>
Pres-Vac	<i>Eric Sørensen</i>
ThyssenKrupp Marine Systems	<i>Patrick Kaeding*</i>
TNO Quality	<i>Ben van Baarle</i>
VNSI	<i>Ruud Schouten, Marco Kirsenstein</i>
Volkswerft Stralsund	<i>Dietmar Simon</i>
Winel	<i>Bert Knijp</i>

* Also member of the IPR Working group of CESA

²⁴¹ Please note that this list does not include the companies and persons contacted through the questionnaire, and that some companies and persons that were contacted have not been included in this list at their request for reasons of confidentiality.

Annex IV: IPR protection in China and South Korea

First a short overview of the existing laws with regard to the IPR protection in China and South Korea will be provided, after which the shortcomings of both systems will be considered in further detail.

IV.1 China

a. Legal framework

China has been a member of various international IPR protection agreements, treaties and organisations for many years. China became a member of the World Intellectual Property Organisation (WIPO) on 3 June 1980. In March 1985, it acceded to the Paris Convention for the Protection of Industrial Property. After more than a decade of negotiations, China entered the WTO in 2001.

– Patent Law

In 1984, China adopted the Patent Law to protect and encourage patent rights for inventions-creations (the Patent Law has in the meanwhile been revised in 1992 and 2000).²⁴² Under the Patent Law protection can be obtained for inventions, utility models and designs.

In the Chinese Patent Law, an *invention* is defined as “*any new technical solution relating to a product, a process or improvement thereof.*”²⁴³ The invention patent consists of two major categories which include product invention and process invention.²⁴⁴ First, the *product invention* is a man-made product which does not protect the process of making such a product. Secondly, a *process patent* includes a special process that is used to make a product with special characteristics. A patent granted for the process protects the product made by such process.²⁴⁵

²⁴² Article 1 Patent Law, via www.sipo.gov.cn.

²⁴³ Article 2 Rules for the Implementation of the Patent Law of the People’s Republic of China 2001, via www.sipo.gov.cn.

²⁴⁴ Any improvement on a product invention or process invention should be deemed as a product invention or process invention itself.

²⁴⁵ Article 11 Patent Law.

The subject of a *utility patent* includes “any new technical solution relating to the shape, the structure, or their combination of a product, which is fit for practical use” and requires a much lower level of technical skills than an invention patent.²⁴⁶

The last subject conveys a *design patent* which refers to any new design of the shape, the pattern or their combination, or the combination of the colour with the shape or pattern of a product, which creates an aesthetic feeling and is fit for industrial application.²⁴⁷

In order to obtain a patent right three conditions have to be fulfilled: novelty, inventiveness and usefulness.

- a) The requirement of novelty means that “before the date of filing no identical invention or utility model has been publicly disclosed in publications in the country or abroad or has been publicly used or made known to the public by any other means in the country, nor has any other person filed previously with the Patent Administration Department Under the State Council an application which described the identical invention or utility model and was published after the said date of filing.”²⁴⁸
- b) The requirement of *inventiveness* for an invention conveys no technical solution existing before the filing date. The invention has prominent and substantive distinguishing features and represents a notable progress.²⁴⁹ A utility model requires a lower level of inventiveness than an invention; whereas a design patent requires an even lower level of inventiveness.²⁵⁰
- c) The requirement of *usefulness* means that, “the invention or utility model can be made or used and can provide positive results.”²⁵¹ Generally, this means that an invention has to be applicable in the industrial world and that it cannot just be considered an imagination.

²⁴⁶ Article 2 Rules for the Implementation of the Patent Law of the People’s Republic of China 2001, via www.sipo.gov.cn.

²⁴⁷ Article 2 Rules for the Implementation of the Patent Law of the People’s Republic of China 2001, via www.sipo.gov.cn.

²⁴⁸ Article 22 Patent Law.

²⁴⁹ Article 22 Patent Law.

²⁵⁰ Presentation by Ms. Ivy Lee May, Patent attorney at SHIIPS in California, U.S.

²⁵¹ Article 22 Patent Law.

In order for a design to qualify as a patent, it shall not be identical with or similar to any design which, before the filing date of the application, has been publicly disclosed in domestic or foreign publications or has been publicly used within the country.²⁵² Since a design patent is being used for a particular product, the patent right is limited to such type of product. That also implies that the use of a similar design on a different type of product does not constitute a patent infringement.²⁵³

The following inventions are excluded from patent protection: scientific discoveries, rules and methods for mental activities, methods for the diagnosis or for the treatment of diseases, animal and plant varieties (processes used for producing such varieties may be granted a patent right)²⁵⁴ and substances obtained by means of nuclear transformation.²⁵⁵

Applications for patent registrations have to be submitted to the (Patent Administration Department of the) State Intellectual Property Office (SIPO) in Beijing. SIPO offices at the provincial and municipal level deal with the administrative enforcement. A foreign company that wants to file a patent can only do so through an authorised Chinese patent agent. China applies the so-called '*first-to-file system*', meaning that the patent is granted to the applicant that first files the patent (and not to the one that first invented the product or process).²⁵⁶ If there is no reason to reject a patent invention after substantial examination and no reason to reject a utility model or design after preliminary examination,²⁵⁷ SIPO issues the certificate of patent, and registers and announces the patent. A patent invention can be protected for 20 years, while the duration of design patents and utility patents is 10 years.

The Paris Convention obliged China to incorporate the right of priority in its Patent Law.²⁵⁸

²⁵² Article 23 Patent Law.

²⁵³ Xiang Wang, *Chinese Patent Law and Patent litigation in China* (Asian Studies, School of Law University of Maryland, number 5, 1998(148)), p. 17.

²⁵⁴ China promulgated Plant New Varieties Protection Regulation in 1997. Some plant varieties may be granted a plant varieties right subject to such Regulation.

²⁵⁵ Article 25 of the Patent Law.

²⁵⁶ This is the same system as is applied in the European Union. In some other countries, such as the United States, the "*first-to-invent*" rule is applied. See U.S. Department of Commerce, International Trade Administration, January 2003, via www.usembassy-china.org.cn/ipr/ovview.html.

²⁵⁷ Whether the patent certificate is issued by SIPO is based on the examinations for different categories of patents.

²⁵⁸ Since 1992 the right of priority applies to both foreign and Chinese applicants (see Article 29 Patent Law). The applicant enjoys a right of priority during 12 months from the date that an applicant first filed an application for a patent in another country (or 6 months in case of a design patent).

– Trademark Law

The Chinese Trademark Law was promulgated on 23 August 1982 and has been revised twice after, in 1993 and 2001.²⁵⁹ China joined the Madrid Protocol in 1989 which obliged China to extend its reciprocal trademark registration to all Member countries. The Chinese Trademark Law now shows consistency with the international standards and the requirements which are outlined in the TRIPs Agreement, especially Articles 15-21 and Article 24 (right of priority). In accordance with Article 15 (1) of the TRIPs Agreement, any ‘word, design, letters of an alphabet, numerals, three-dimensional symbol, combination of colors and any combination of the above’ can be registered.²⁶⁰ However, trade names are not expressly covered by the Chinese Trademark Law, as is required under the TRIPs Agreement.²⁶¹ In conformity with Article 16(1) of the TRIPs Agreement, the Chinese Trademark Law states that to sell or make counterfeit products without authorisation, to use an identical or similar mark in respect of similar goods without authorisation or to cause prejudice to the exclusive right of the trademark registrant amounts to an infringement of the right to exclusively use a registered trademark.²⁶² If a trademark has not been used for three consecutive years it may be annulled. This rule does not provide in any exception in case there is a valid reason for non-use, although that is also provided by the TRIPs Agreement.²⁶³ The trademark is protected for a period of ten years from the date the registration is approved. The period of validity for each renewal of registration shall be ten years.²⁶⁴

Comparable to the filing of a patent application, China has adopted a first-to-file system. Although a foreign company could initially only register a trademark through an authorised Chinese agent, recent amendments to the Implementing Regulations of the

²⁵⁹ In addition to the Chinese Trademark Law, the Implementing Regulation also sets out rules that govern Chinese trademark law.

²⁶⁰ Article 8 Trademark Law, via www.chinaipr.com.

²⁶¹ A. Gregory, *Chinese trademark law and the TRIPs Agreement: Confucius meets the WTO, China and the world trading system: entering the new millennium*, Cambridge University Press (2003).

²⁶² Article 52 Trademark Law.

²⁶³ Article 19 TRIPs Agreement.

²⁶⁴ The minimum term of protection prescribed by the TRIPs Agreement is seven years, Article 18 TRIPs Agreement. According to Chinese Trademark Law, the trademark owner is entitled to renew the right of trademark within six months before expiration of the ten years.

Trademark Law have made it possible for operating establishments of foreign companies (such as a WFOE or an EJV)²⁶⁵ to directly register trademarks without use of a Chinese agent.²⁶⁶

Unregistered trademarks are protected under the Anti Unfair Competition Law if such trademarks are well-known enough. The application of a trademark is published in the China Trademarks Gazette and is open to opposition for three months.

– Copyright Law

In 1990 China adopted the Copyright Law of the People's Republic of China. Soon after China acceded to the Berne Convention for the Protection of Literary and Article Works, it joined the Universal Copyright Convention.²⁶⁷ To ensure the enforcement of the applicable Copyright Treaties, China put into play a series of laws and regulations which include the Enforcement Regulations of Copyright Laws of the People's Republic of China, the Protective Regulations on Computer Software, the Rules on the Enforcement of International Copyright Pact, and the Resolution on Punishment of Infringing Copyrights. In 2001, China revised its Copyright Law in order to meet international standards and to respond to the challenges in copyright protection due to rapid scientific and technical developments.

Any work, published or not, may be protected by the Chinese Copyright Law. Without registration, protection is in any case granted to individuals from countries that have joined the International Copyright Conventions or bilateral agreements to which China is a member. If copyright owners wish to register their right, they can do so with the National Copyright Administration (NCA) to establish evidence of ownership with a view to potential enforcement actions. According to the Chinese Copyright Law, copyrightable works include "*works of literature, art, natural science, social science, engineering technology and the like which are expressed in the following forms: written and oral works; musical, dramatic, quyi [a form of Chinese opera], and choreographic and acrobatic works; works of fine art and architecture; photographic works; cinematographic works and works created by virtue of an analogous method of film production; drawings of engineering designs, and product designs; maps, sketches and other graphic works*

²⁶⁵ WFOE means 'Wholly Foreign Owned Enterprise', which is a limited liability company established in China by foreign investor(s). EJV means 'Equity Joint Venture', which is a limited liability company separate and distinct from its investors. An EJV is jointly established by one or more Chinese parties and one or more foreign parties.

²⁶⁶ Representing offices of foreign companies are however not authorised to directly register trademarks without the use of a Chinese agent.

²⁶⁷ China has been a party to the Universal Copyright Convention since 30 July 1992.

and model works; computer software and other works as provided for in laws and administrative regulations".²⁶⁸ Laws, regulations, resolutions, decisions and orders of State organs and other documents of a legislative, administrative or judicial nature and their official translations as well as prohibited works are however not protected by the Copyright Law either.²⁶⁹

A foreign work is protected if the work meets one of the following two conditions: 1) the work is first published within the Chinese territory; or 2) if the work is first published outside the Chinese territory, the author of the work belongs to a country which has entered into an agreement with China on copyright or whose country has joined an international copyright agreement to which China is a party.²⁷⁰ If a work is created by adaptation, translation, annotation, compilation, or arrangement of a pre-existing work, the copyright in the derivative work belongs to the adaptor, translator, compiler, or arranger.²⁷¹

The work of a citizen is protected during the lifetime of the author and fifty years after, while the copyright of a legal entity or other organisation is protected for a period of fifty years, expiring on December 31 of the fiftieth year after the first publication of such work.²⁷² The Copyright Law mentions some circumstances where a work may be exploited without the permission from, and without remuneration to, the copyright owner,²⁷³ provided the name of the author and the title of the work are mentioned.²⁷⁴

– Unfair Competition

The Anti-Unfair Competition Law²⁷⁵ provides protection for unregistered trademarks, packaging, trade dress and trade secrets. The Fair Trade Bureau that belongs to the

²⁶⁸ Article 2 and 3 Copyright Law, via www.chinaiprlaw.com.

²⁶⁹ Article 4 and 5 Copyright Law.

²⁷⁰ Article 2 Copyright Law.

²⁷¹ Article 12 Copyright Law.

²⁷² Article 21 Copyright Law.

²⁷³ If anyone other than the copyright owner wants to exploit a copyrighted work, he has to enter into a licensing agreement with the copyright owner (Article 24 Copyright Law).

²⁷⁴ See Article 22 Copyright Law. Examples are: the use of published work for the purposes of the user's own private study, appropriate quotation from a published work in one's own work and reuse or citation of a published work in newspapers, periodicals, at radio stations, television stations or any other media for the purpose of reporting current events.

²⁷⁵ Via <http://en.chinacourt.org>.

State Administration for Industry and Commerce (SAIC) is responsible for the interpretation and implementation of the Unfair Competition Law.²⁷⁶

- Enforcement

In China, three different routes are available for the enforcement of IP rights: administrative, civil and criminal enforcement.

Administrative enforcement can take place via the following agencies and offices:

- *Administration for Quality Supervision, Inspection and Quarantine (AQSIQ)*

This agency is primarily tasked with ensuring product quality, but also deals with infringements of registered trademarks, when the infringing products are in the form of an inferior quality.

- *State Administration on Industry and Commerce (SAIC), Trademark Office*

The SAIC is responsible for trademark registration, administrative recognition of well-known trademarks and the enforcement of trademark protection. The Fair Trade Bureau ensures the enforcement of the Anti-Unfair Competition Law. SAIC has the power to investigate a case, as well as – in case of an infringement – the power to order that the sale of infringing items ceases and to stop further infringement, order the destruction of infringing goods, impose fines and remove machines that were used for the production of the counterfeited goods.

- *State Intellectual Property Office (SIPO)*

SIPO is responsible for the examination of foreign and national patents.

- *National Copyright Administration (NCA)*

NCA is responsible for the registration of copyrights and the enforcement thereof.

²⁷⁶ U.S. Department of Commerce, International Trade Administration, January 2003, via www.usembassy-china.org.cn/ipr/ovview.html.

- *General Administration of Customs (GAC)*
The GAC bans the import and export of IPR infringing and counterfeited goods. The GAC hands out a record certificate that is valid for ten years as from the date of approval by the GAC. If the period of validity of an IPR is less than ten years from the effective date of record, the period of validity for record shall be the period of the validity of the IPR. If a rights holder suspects infringing goods to enter China, he may notify the GAC by submitting a written application at the suspected point of entry. In case of a discovered infringement, the GAC has the authority to confiscate the goods, destroy or remove them and impose a fine.

- *Public Security Bureau (PSB) (police) / Procuratorate (prosecutors)*
In accordance with the TRIPs Agreement, China's IPR laws allow IP administrative authorities to transfer IP infringing cases to the police and the prosecutors for criminal investigation. Also IPR owners and legal users may report infringing cases to PSB. However, it has been shown that most IPR infringing cases continue to be dealt with by the administrative authorities.

- *Regional IPR Bureau*
Most local and regional IPR offices rather occupy themselves with campaigning and the provision of information concerning IPR enforcement to companies than enforcement itself.²⁷⁷

Appeals from administrative IPR decisions should in principle be made to the Administrative Tribunals of the competent People's Court with jurisdiction according to the Administration Procedure Law of the PRC.²⁷⁸

Civil enforcement takes place through civil actions in the Local People's courts. There are special Intellectual Property Tribunals in the Intermediate People's Courts and Higher People's Courts. Although the route of civil litigation is not chosen as often as the route of administrative enforcement, there are arguments in favour of the use of civil litigation:

²⁷⁷ See U.S. Department of Commerce, International Trade Administration, January 2003, via www.usembassy-china.org.cn/ipr/ovview.html.

²⁷⁸ People's Courts at intermediate level or above have the right to review the appeals from administrative IPR decisions. The Supreme Court merely has the jurisdiction over grave and complicated administrative cases in the whole country.

- *flexibility to determine forum for dispute*. This flexibility enables the plaintiff to remove the case from the defendant's influence sphere and to choose a court that is known for its IPR expertise;²⁷⁹
- *public and open nature of litigation*: civil litigation is more open than administrative enforcement, which enables the plaintiff to involve the press and the public opinion;
- *availability of "provisional measures"*: certain provisional measures such as preliminary injunctions, evidence preservation orders²⁸⁰ or property preservation orders²⁸¹ are only available in civil courts;
- *compensation and other remedies*: civil courts may grant various forms of redress to the plaintiff. They can:
 - (i) order the cessation of infringing acts;
 - (ii) require the provision of undertakings of non-infringement;
 - (iii) order the confiscation and/or destruction of infringing products, tools and moulds;
 - (iv) impose fines;
 - (v) require the issuing of public apology;
 - (vi) order the defendant to pay damages.

Compensation for damage can only be claimed in a civil procedure (administrative courts are only allowed to impose fines). The Chinese courts can grant compensation of damage based on the proven losses of the plaintiff, the profit made by the defendant or on a multiple of 1-3 times the royalty of a legitimate licensee. In case none of the abovementioned compensations are

²⁷⁹ The Beijing No. 1 and Shanghai No. 2 Intermediate People's Courts are said to have considerable IPR expertise, see E. Papageorgiu, C. Bailey, 'Effective intellectual property enforcement in China', *BMM bulletin*, volume 113, no. 1/2007, p. 6.

²⁸⁰ Evidence preservation orders may even imply "*the judge visiting the infringer's premises and ordering that relevant documentation and other media containing information about the alleged infringement be seized and/or copied*", see E. Papageorgiu, C. Bailey, 'Effective intellectual property enforcement in China', *BMM bulletin*, volume 113, no. 1/2007, p. 6.

²⁸¹ Property preservation orders usually involve "a petition to the court requesting, for example, that certain assets of the infringer be sequestered to ensure they are not disposed of or lost, and remain available for any award made by the court in subsequent action", see E. Papageorgiu, C. Bailey, 'Effective intellectual property enforcement in China', *BMM bulletin*, volume 113, no. 1/2007, p. 6.

applicable the law also provides for statutory damages of up to 500,000 RMB (approx. € 50,000).²⁸²

The strongest form of enforcement is *criminal enforcement*, with potentially unlimited fines and up to seven years imprisonment. The organs that are responsible for the criminal enforcement are the Public Security Bureau (PSB) and the Public Procuratorate. There are three ways criminal prosecutions can start:

- i. by bringing a private criminal complaint and private prosecution before the court by the rights holder;
- ii. by requesting the PSB to bring a criminal enforcement action. The IP holder then usually supplies evidence for the infringement (which has to meet the criminal liability thresholds).
- iii. by bringing an administrative enforcement proceeding (AIC, AQSIQ or NCA), seeking the evidence needed for the criminal liability thresholds and transferring the case to the PSB (in practice this method is most used).

b. Problems of enforceability

The analysis we have conducted shows that the theoretical legal framework is not so much the problem (both China and South Korea are bound to the TRIPs Agreement and have national intellectual property laws), but that the lack of enforceability forms the main bottleneck. China was even the source of 80% of counterfeit goods intercepted at EU borders in 2006.²⁸³

Important burdens of litigation in countries in the Far East are a lack of awareness of industry about what is and what is not allowed, the cost of litigation, ‘discriminatory’ procedural requirements (e.g. the need to notarise and legalise powers of attorney and evidence from other countries than China) and a low commitment to supporting intellectual property laws due to the – government supported – overriding goal of rapid economic development and (particularly for China) the lack of a tradition in IPR protection.²⁸⁴ A recent study of the European Commission also shows that China is not

²⁸² E. Papageorgiu, C. Bailey, ‘Effective intellectual property enforcement in China’, *BMM bulletin*, volume 113, no. 1/2007, p. 6. However, in legal practice it is understood that compensation for damages may be more than statutory RMB 500,000, if evidences show that the losses of the plaintiff are apparently beyond the statutory damages of 500,000 RMB.

²⁸³ See e.g. MEMO/07/237, EU-China Ministerial Meeting of 12 June 2007.

²⁸⁴ See also Ranjard P., Misonne B., Study on the Future Opportunities and Challenges of EU-China Trade and Investment Relations, Study 12: Exploring China’s IP Environment – Strategies and Policies.

performing the commitments it has made within the WTO framework and that is especially lagging behind in the field of IP.

The Chinese Trademark Law encourages the parties to mediate settlement, including the quantum of damages, before exercising their right to institute legal proceedings.²⁸⁵ The administrations of Industry and Commerce (AIC's) and the People's Court are both authorised to order injunctions and to confiscate and destroy infringing products, trademarks and manufacturing equipment.²⁸⁶ In case of infringement, compensation is defined to include either an account of profits or the losses incurred by the party during the period of infringement. Generally speaking, in cases where the amount of compensation is difficult to determine, the statutory damages may not be higher than RMB 500,000.²⁸⁷ Although the amount of fines awarded is often so low that it hardly seems worth while for foreign IP holders to engage in IP litigation, the Chinese courts have awarded high fines *against* foreign companies. The Chinese court has ordered the French company Schneider Electric, for example, to pay a Chinese company € 31m in damages for infringing its patent, the largest amount ever awarded in an intellectual property case in the country.²⁸⁸

Chinese vendors who have been caught selling infringing goods can even avoid liability if they do not know such goods are made and sold without the permission of the rights owner and prove that they obtained their infringing products legitimately.²⁸⁹ All these circumstances provide the image of a rather protectionist environment.

Furthermore, many cases that meet the criminal thresholds are still not prosecuted for the following reasons:

- a) *reluctance of administrative officials to transfer the case*, because administrative authorities are often assessed on the number and size of successful cases;
- b) *local protectionism*: often economic priorities seem to prevail over law enforcement;
- c) *lack of manpower and knowledge*;

²⁸⁵ Article 54 Trademark Law.

²⁸⁶ A. Gregory, *Chinese trademark law and the TRIPs Agreement: Confucius meets the WTO, China and the world trading system: entering the new millennium*, Cambridge University Press (2003).

²⁸⁷ Article 56 Trademark Law. However, as stated before, in legal practice it is understood that compensation for damage may be more than statutory RMB 500,000, if evidences show that the losses of the plaintiff are apparently beyond the statutory damages of 500,000 RMB.

²⁸⁸ See 'China fines Schneider €31m' in the Financial Times of 1 October 2007, p. 19.

²⁸⁹ Art. 56 Trademark Law.

- d) *valuation of products*: there are three different methods to value the value of infringing products (the sales value, the average market price and value of genuine goods). The valuation method has a significant influence on the question whether the case meets the criminal liabilities thresholds.²⁹⁰

IV.2 South Korea

For many years South Korea has been a member of various international IPR protection agreements, treaties and organisations, among which the World Intellectual Property Organisation (1979), the Paris Convention for the Protection of Intellectual Property Rights (1980), the Patent Cooperation Treaty (1984), Universal Copyright Convention (1987), the TRIPs Agreement of the WTO (1995), the Berne Convention (1996), the Trademark Law Treaty (2003) and the WIPO Copyright Treaty (2004).

- a. Legal framework
 - Patent Law

The protection and registration of patents in South Korea is provided for by the Patent Act, dating from 31 December 1961.²⁹¹ Under the Patent Act, for a patent to be registered it should fall under the definition of invention as well as have novelty, industrial applicability and an inventive step.²⁹² The following inventions are not patentable:

- 1) inventions publicly known or worked in Korea or in a foreign country before the filing of the patent application;
- 2) inventions described in a publication distributed in Korea or in a foreign country before the filing of the patent application or inventions published through electric telecommunication lines as prescribed by Presidential Decree;
- 3) inventions that could have been easily conceived by a person skilled in the art from the prior art; and
- 4) inventions likely to contravene public order or morality or to injure public health.²⁹³

²⁹⁰ E. Papageorgiu, C. Bailey, 'Effective intellectual property enforcement in China', *BMM bulletin*, volume 113, no. 1/2007, p. 7.

²⁹¹ Via www.kipo.go.kr.

²⁹² Via www.kipo.go.kr or www.epo.org.

²⁹³ Article 29 Patent Act.

A patent application must be submitted to the Korean Intellectual Property Office (KIPO).²⁹⁴ The KIPO is in charge of intellectual property administration and grants IPR, but also commercialises them and protects them from infringement. Either the inventor or his assignee can file the patent application with the KIPO. The applicant may both be a natural or a legal person. The Korea Patent application is based on the principle of '*first-to-file*', meaning that where two or more applications related to the same invention are filed on different dates, only the applicant of the application with the earlier filing date can obtain a patent for the invention.²⁹⁵ After the application, a patent right is granted through various steps: formality examination,²⁹⁶ laying open of publication for public inspection, request for examination, substantial examination,²⁹⁷ rejection, registration and publication. Usually it takes about ten months to issue the first office action after a formal request for examination of the application is made in South Korea.²⁹⁸

The duration of patent protection is twenty years from the filing date of the application (fifteen years for models) commencing upon registration and that term can, in principle, not be renewed.²⁹⁹ However, in certain exceptional cases it is possible to obtain a five-year extension.³⁰⁰ South Korea has incorporated the right of priority in its patent laws.³⁰¹ In order to benefit from the priority right, the application should be filed in South Korea within one year from the filing date of the priority application. The priority document (a certified copy of the priority application together with a Korean translation) may be submitted within one year and four months from the priority date. If the priority document is submitted after that period of time, the claim of priority will become null and void.³⁰² Additionally, the Patent Act provides for a series of provisions regarding the international application procedure under the Patent Cooperation Treaty (which can be done directly to the KIPO).³⁰³

²⁹⁴ See also on patent applications, Article 42 Patent Act.

²⁹⁵ Article 36 (1) Patent Act.

²⁹⁶ Article 11 Enforcement Regulation of the Patent Act. The application will be treated as if it had never been submitted where the kind of application is not clear, where the name or address of a person is not described, where the application is not written in Korean, where the application is not accompanied by the specification/claims or drawings or where the application is submitted by someone who has no address or place of business in South Korea, without using an agent in South Korea (www.kipo.go.kr).

²⁹⁷ A patent application will not be substantially examined until a formal request for substantive examination is made by the applicant or a party in interest, within five years from the filing date of the application. If no request for examination is made within the five-year period, the patent application is deemed to have been withdrawn.

²⁹⁸ Via www.epo.org/patents/patent-information/east-asian/helpdesk/korea/faq.html.

²⁹⁹ Article 88 Patent Act.

³⁰⁰ Article 89 Patent Act.

³⁰¹ Article 54 Patent Act.

³⁰² Korean Intellectual Property Office, Procedures for granting a Patent, via www.kipo.go.kr.

³⁰³ Article 192-224 Patent Act.

Article 96 Patent Act implements Article 5ter Paris Convention³⁰⁴

The effect of a patent right does not extend to any of the following subparagraphs:

- i) working a patented invention for research or experimental purposes;
- ii) vessels, aircraft or vehicles merely passing through The Republic of Korea, or machinery, instruments, equipment, or other accessories used on the vessels, aircraft or vehicles; or
- iii) articles existing in the Republic of Korea when the patent application was filed.

– Utility Models

Registering an invention as a utility model is another – less difficult and less expensive – way of protecting a product. The protection of utility models is laid down in the Utility Act.³⁰⁵ The purpose of this Act is “*to encourage, protect, utilise practical devices, thereby improving and developing technology, and to contribute to the development of industry*”.³⁰⁶ A utility model can be granted for “*devices that are industrially applicable and relate to the shape and structure of an article or combination of articles*”.³⁰⁷

A utility model application can be filed with the KIPO. Shortly, the utility model application proceeds in the same manner as a patent application, except that the request for examination of the utility model application should be filed with KIPO by the applicant or an interested party within three years from the filing date of the application.³⁰⁸ The ‘*first-to-file*’ rule is equally applicable to utility models.³⁰⁹

It is not possible to file a patent application and a utility model application at the same time. Prior to 1 October 2006, it was possible to file these two applications in parallel in order to get early protection for an invention. In case the patent was granted the registered utility model had to be withdrawn. Since the abolition of the possibility of dual filing in October 2006, South Korea decided to reintroduce the possibility of converting

³⁰⁴ See section 3.1 where it is explained that this provision can form a burden to protection.

³⁰⁵ Via www.kipo.go.kr.

³⁰⁶ Article 1 Utility Model Act.

³⁰⁷ Article 5 (1) Utility Model Act.

³⁰⁸ The non-substantive examination system and the opposition system have been abolished and instead the substantive examination system has been commenced as of July 1, 2007.

³⁰⁹ Article 8 Utility Model Act.

patent applications into utility model applications and vice versa.³¹⁰ The protection for a utility model lasts for ten years.³¹¹

– Design Law

Another way to protect inventions is offered by the Design Protection Act of 31 December 1961.³¹² To apply for an industrial design, the product needs to fall under the definition of a design as given by the Design Protection Act: “*the shape, pattern, colour or a combination of these in an article that produces an aesthetic impression in the sense of sight*”.³¹³ The same applies to a part of an article.³¹⁴ When qualifying as a design the invention needs to fulfil the following criteria. Firstly, the design should be industrially applicable,³¹⁵ meaning that the design is mass-produced in an industrial method.³¹⁶ Secondly, the design must be a novel, meaning that the design should not be identical or similar to any design that is already publicly known or worked or published in Korea or in a foreign country.³¹⁷ Thirdly, the design must correspond to a certain level of creativity, or, to put it differently, “*the design should be a design that could not have been easily created by any person having an ordinary skill in the art to which the design pertains*”.³¹⁸

Applications for an industrial design should be filed with the KIPO. Currently, most applications are examined under the non-substantial examination system. This means that applications still need to fulfil the same requirements as with a substantial examination system. However, if they do not fulfil the requirements they will be invalidated through the post-grant opposition or trial. Due to the introduction of the non-substantial examination system an industrial design can be obtained much faster than before, namely within two or three months. A right of priority may be claimed under the Paris Convention or a bilateral agreement. To claim a right of priority the design application should be filed in South Korea within six months from its first application in a foreign country, the priority date.³¹⁹ The appeal and trial procedure are the same as those of patent and trademarks.³²⁰

³¹⁰ Via www.epo.org/patents/patent-information/east-asian/helpdesk/korea/faq.html.

³¹¹ Article 36 (1) Utility Model Act.

³¹² Via www.kipo.go.kr.

³¹³ Article 2 Design Protection Act.

³¹⁴ *Ibid.*

³¹⁵ Article 5 (1) Design Protection Act.

³¹⁶ Via www.kipo.go.kr.

³¹⁷ Article 5 (1) Design Protection Act.

³¹⁸ Article 5 (2) Design Protection Act.

³¹⁹ Article 23 Design Protection Act.

³²⁰ See under ‘Enforcement’ below.

– Trademark Law

The protection and registration of trademarks is laid down in the 1949 Trademark Act, which has been amended several times. The South Korean Trademark Law has been revised to conform with the Trademark Law Treaty and the Madrid Protocol.

A trademark is defined as ‘*a sign, a character, a figure, a three-dimensional shape, colour, hologram or any combination thereof, as well as others which are visually recognisable*’.³²¹ Trademark registration may be obtained, except:

- where the mark consists solely of a sign indicating the usual name of the goods;
- where the mark is customarily used on the goods;
- where the mark consists solely of a mark indicating one of the characteristic of the product (such as origin, quality);
- where the mark consists solely of sign indicating a conspicuous geographical name (or abbreviation or map);
- where the mark consists solely of a sign indicating a common surname or name of legal entity;
- where the mark consists solely of a very simple and commonplace sign; or
- where the mark does not enable consumers to recognise the person whose goods are indicated by the good.³²²

Article 7 of the Trademark Act sums up the grounds for not admitting the registration of a trademark, such as similarity to senior mark, similarity to well-known marks, public order or morality, etc.

The Madrid Protocol allows companies from the member nations to apply for trademark ownership in several member nation countries simultaneously. In South Korea, a foreign company can register its trademarks and patents with the KIPO.³²³ Registration of a trademark is no prerequisite for the use of a trademark; however, no protection is provided without registration. Foreign applicants are required to retain a licensed local attorney in order to prepare applications in Korea and to conduct necessary follow-up correspondence locally. In South Korea the trademark registration system is based on

³²¹ Article 2 (1) Trademark Act.

³²² Article 6 (1) Trademark Act.

³²³ Via www.buyusa.gov/korea/en/ipoverview.html. See also on the application procedure, Article 9 Trademark Act.

'first-to-file' instead of 'first-commercial-use' or 'first-intend-to-use'.³²⁴ The duration of trademark protection is ten years counting from the registration date of its establishment and the registration may be renewed for another ten years.³²⁵

In order to enjoy the right of priority,³²⁶ an application should be filed in South Korea within six months from the filing date of the priority application. The priority document (a certified copy of the priority application together with a Korean translation) has to be submitted within three months from the filing date of the application.

– Copyright Law

In order to comply with its obligations under the TRIPs Agreement of the WTO, South Korea amended the Copyright Act and the Computer Program Protection Act.³²⁷ The protection of copyrights is provided by the Copyright Act.³²⁸

The following works can be protected: "*novels, poems, theses, lectures, recitations, plays and other literary works; musical works; theatrical works; paintings, calligraphic works, designs, sculptures, crafts, works of applied art; architectural works; photographic works; cinematographic works; maps, charts, design drawings, sketches models or other diagrammatic works; and computer program works*".³²⁹ "A derivative creation produced by means of translation, arrangement, alteration, dramatisation, cinematisation etc. of an original work", as well as a compilation shall be independently protected".³³⁰

Copyrights can be registered at the Copyright Commission³³¹ designated by the Ministry of Culture and Tourism (MOCT).³³² Korean copyright law provides copyright protection for

³²⁴ Article 8 Trademark Act.

³²⁵ Article 42 Trademark Act.

³²⁶ A right of priority can be claimed under Article 20 of the Trademark Act.

³²⁷ Y. Choi, 'Development of Copyright Protection in Korea: its history, inherent limits, and suggested solutions', *Brook J. Int'l L.*, Vol. 28:2, 2003, p.663. However, the Korean Copyright still fails to comply with the TRIPs Agreement, for example, as it does not protect foreign works whose authors died before 1957.

³²⁸ Via www.kipo.go.kr.

³²⁹ Article 4 (1) Copyright Act.

³³⁰ Article 5 (1) and Article 6 (1) Copyright Act.

³³¹ See www.copyright.or.kr.

³³² The Copyright Team forms part of the Cultural Industry Office that falls under the Ministry of Culture and Tourism. The Copyrights Team establishes, formulates, and executes a general plan of copyrights policy, handles matters related to approval and registration of copyrights, is concerned with International Cooperation and exchange regarding copyrights, prevents infringement of copyright and copyright protection, deals with matters related to establishing a foundation for the improvement of the copyrights industry, affairs related to copyrights law education and publicity activities of the system and matters regarding the Copyright Commission for Deliberation and Conciliation. See <http://www.mct.go.kr/english/>.

only 50 years from the date of 'making it public' for works authored by juridical persons, while individuals can receive protection for the lifetime of the author, plus 50 years from the date of creation.

– Unfair Competition and Unfair Trade Practices

The protection against unfair competition and trade secrets misappropriation is covered by the Unfair Competition Prevention and Trade Secret Protection Law (UCPA Act). The Act was substantially amended on 31 December 1986. The purpose of the UCPA Act is *'to maintain the order of sound transactions by preventing unfair competitive acts, such as unjust use of another person's trademark, trade name, etc. known to the public in Korea, and any act infringing on another person's trade secret'*.³³³ In 2004, the UCPA Act was once more amended, strengthening penalties for disclosing trade secrets.

Anyone who discovers unfair trade practices within one year from the alleged infringement and who can present concrete information and evidence, can rely on the Act on the Investigation of Unfair Trade Practices and Remedies against Injury of Domestic Industry (Trade Remedy Act³³⁴).³³⁵ Activities constituting an unfair trade practice under the Act are:

- 1) the import or export of any products which infringe on intellectual property rights such as patent, trademark, copyright, etc. and/or
- 2) the sale of such infringing products in South Korea.³³⁶

Under this Act, the Korean Trade Commission (KTC)³³⁷ is empowered to initiate investigation of and impose sanctions for unfair trade practices. In its investigation the KTC may: 1) order testimony of parties or interested persons; 2) order inspection of locations and materials and 3) appoint an expert. The KTC may impose provisional measures (injunction or measures to prevent injury from unfair trade practices),³³⁸ corrective measures (suspending imports, exports, sales and/or manufacture, blocking

³³³ Article 1 UCPA Act.

³³⁴ Via www.ktc.go.kr. In 2000, the Trade Remedy Act was enacted for the purpose of increasing the effectiveness of the Korean Trade Commission in preventing unfair trade practices. The Act, which is similar to provisions in the Foreign Trade Act, became effective as a separate bill on May 4, 2001.

³³⁵ Article 5 (2) Trade Remedy Act.

³³⁶ Article 4 (1) Trade Remedy Act.

³³⁷ The KTC is a government agency responsible for supervising the relief system for import-related injuries and preventing unfair trade practices in Korea. It is organised under the Korean Ministry of Commerce, Industry and Energy.

³³⁸ Article 7 Trade Remedy Act.

customs clearance of or destroying infringing goods)³³⁹ and monetary penalties (based on a transaction amount formula).³⁴⁰

– Enforcement

The main form of patent enforcement in South Korea is a civil action in a District Court, but criminal sanctions can also be imposed on a patent infringer by a District Court. A criminal patent infringement action is handled by a public prosecutor; the patentee files a complaint with the prosecutor's office but is not a party *per se*. Criminal actions for patent infringement are not common. Appeals from the District Courts (in civil actions) are reviewed by the intermediate High Courts. The highest level of appeal is at the South Korean Supreme Court.

Other actions related to patent enforcement may be initiated before the Intellectual Property Tribunal (IPT). The IPT is an administrative tribunal within KIPO. The IPT is the first *ex parte* appeal review board for patent prosecution appeals. The IPT is also an inter-parties forum where opposing parties may resolve disputes on the validity and scope of enforceability for a granted patent. For issues on the validity of a patent, the IPT has exclusive subject matter jurisdiction. The patentee, the alleged infringer or any other party in interest, may file such administrative patent related actions, either in parallel with or independent of a District Court action.

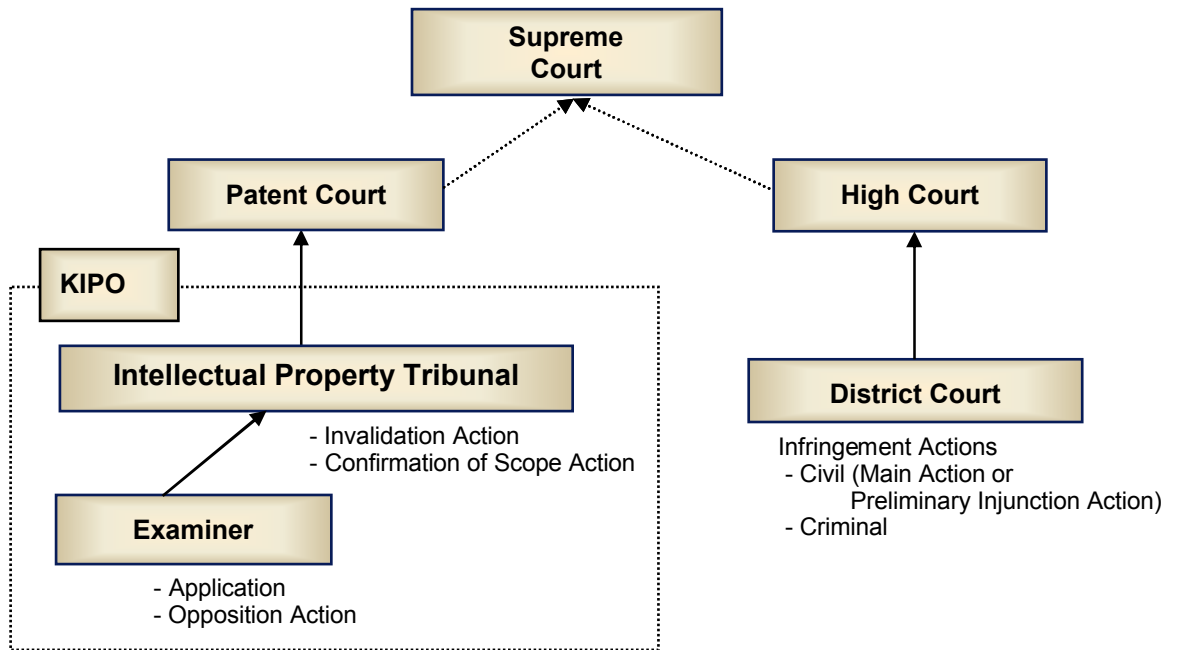
Jurisdiction for review of IPT decisions lies solely with the Korean Patent Court. The Patent Court is an intermediate appeal court. It is a judicial court, which reviews IPT administrative decisions. The Patent Court does not review patent infringement-related decisions from the District Courts. Appeals from the Patent Court are reviewed by the Korean Supreme Court.

³³⁹ Article 10 Trade Remedy Act.

³⁴⁰ Article 11 Trade Remedy Act.

The following is a schematic overview of the Korean court system for patent lawsuits.

Korean Court System: Patent Litigation



There are two types of *civil actions* possible for patent infringement:

- 1) *Preliminary injunction action* (if there exists an immediate or present danger of irreparable harm to the patentee, but no remedies other than injunction are available in this type of action);³⁴¹ and
- 2) *Main action* (all civil remedies including permanent injunction and monetary compensation are available in a main action).

Two types of *administrative action* are common:

- 1) *Invalidation action*
An invalidation action may be filed with the IPT. It may be initiated by either an interested party or by an examiner of the KIPO at any time, even after a patent has expired. An interested party is defined as any person who is, or is likely to be,

³⁴¹ South Korean courts have substantially raised the threshold for granting preliminary injunctions; and they are rarely granting preliminary injunctions in patent infringement actions.

affected because he may have the patent in question asserted against him by the patentee. Therefore, any person who is in the business of manufacturing or selling products made by using a patented invention or who is suspected of using a patented invention from the nature of his business, is an interested party for the purpose of an invalidation action.

2) *Confirmation of the scope of action*

An action to confirm the scope of a patent may be filed with the IPT.³⁴² In such an action, the petitioner seeks a decision on whether or not a certain article or process falls within the scope of a patent's claims. Therefore, such actions are normally instituted by an interested party who seeks a decision that his article or process does not fall within the scope of a patent right. In theory, a patentee may bring such action. However, in order for the patentee to establish standing for filing such an action, it must show that the article or process presented in the action is, or at least likely, to be actually used by a third party. Because of this burden of proof, there have been much fewer cases brought by patentees.

A *criminal action* can be filed with the prosecutor's office.³⁴³ The complaint must be filed in the name of a designated company official of the patentee company. The complainant is generally a senior company executive; and may be called upon by the prosecutor's office and/or the police. The complainant may be a foreign resident (i.e., he does not need to be located in Korea), but will have to be available for the prosecutor and police investigation.³⁴⁴ After the complaint has been filed with the prosecutor's office, the complaint will go through the following phases:

– *Preliminary investigation by the police*³⁴⁵

The investigation can consist of taking the testimony of the complainant; the suspect; the review of the physical evidence and interrogation of other involved individuals. The investigation by the police takes about two

³⁴² A District Court is, however, not bound by the decision rendered by the IPT as the administrative decision may be considered only an advisory opinion.

³⁴³ Although there are exceptions, the complaint is usually filed with the Prosecutor's Office having geographic jurisdiction over the suspect's place of business.

³⁴⁴ If the Complaint is later founded to be a false accusation, the table could be turned and the Complainant may be found criminally liable for "false accusation." Such "false accusation" charges are rarely upheld – it will be found only if the original accusation was based on false facts. Nonetheless, such a charge "false accusation" could be difficult and harassing for the individual.

³⁴⁵ The prosecutor has the discretion to refer the case to the police for investigation or to initiate an investigation within the Prosecutor's Office. For patent infringement cases, the Prosecutor is likely to refer to the police for the preliminary investigation.

months, where after the police will prepare a report for the prosecutor's office.

- *Transfer to the prosecutor and further investigation*
The prosecutor will conduct his own investigation, which takes about three months.
- *The prosecutor's decision: non-prosecution or indictment*
The prosecutor has the discretion not to seek an indictment in all cases. In practice prosecutors have generally taken a cautious approach to issuing indictments. If an indictment is issued, the prosecutor will bring a criminal action against the suspect.
- *Criminal action*
The criminal action will be conducted before the District Court having geographical jurisdiction over the case. The prosecutor may request the court to apply a summary procedure to a case where the sought penalties are limited to fines. In such case no trial is generally held, and the court issues its judgment within thirty days from the suspect's indictment. If the sought penalties involve relatively heavier fines and/or imprisonment, a trial will be held before the District Court.
- *Appeal*
The defendant or prosecutor can appeal a District Court decision to the High Court within seven days of the District Court Decision. The High Court decision can be appealed by either side to the Supreme Court, the final court of appeal.

Generally speaking, criminal prosecution for patent infringements is rare in South Korea; it is more common with regard to copyright and trademark infringements. First, police often has difficulty understanding the relevant technologies. Second, unless the patent infringement case is simple and very strong, it is very difficult to persuade the prosecutor to indict.³⁴⁶

³⁴⁶ A decision by the prosecutor's office not to indict could negatively impact other related cases and significantly affect the bargaining position between parties.

b. Problems of enforceability

As Korea became more attractive for investment, the number of foreign companies has grown steadily. Understandably, these foreign companies often seek increased protection of their IP rights. Despite efforts to comply with the TRIPs Agreement and the World Trade Organisation rules, there have been serious problems with regard to a lack of protection and enforcement of IP rights in South Korea.³⁴⁷ There is (especially) room for improvement in the field of trademark and copyright protection. Counterfeit goods, cyber squatting and copyright piracy committed by individual underground market players are major problems.

Part of the difficulties may be related to cultural factors.³⁴⁸ More specific, in South Korea enforcement mechanisms are present in various sectors, but they are often not yet effective enough to cope with the counterfeiting and piracy on broad scale.³⁴⁹

The following aspects could, in particular, be improved:³⁵⁰

- More active participation by the government authorities in the IPR enforcement policy and more support for actions against IPR infringements by government authorities;
- Improvement of human resources (i.e. judges, prosecutors, police men, customs officials);
- Improvement of the implementation of civil and criminal judicial procedures and remedies;
- Improvement of the damages awards in civil litigations;
- Improvement of the customs procedures to prevent exports of IP infringing goods;
- Reorganisation of the current judicial system, placing more emphasis on education and specialization with regard to IPR;
- Granting of exclusive jurisdiction to the Patent Court to avoid inconsistency and legal uncertainty concerning all patents matters, including infringements (instead

³⁴⁷ H. Kim, 'Korea's experience with intellectual property protection and membership to the Agreement on Trade-Related Aspects of Intellectual Property Rights', *Korean J. Int'l & Comp.*, Vol. 32, 2004, p. 129.

³⁴⁸ See also Y. Choi, 'Development of Copyright Protection in Korea: its history, inherent limits, and suggested solutions', *Brook J. Int'l L.*, Vol. 28:2, 2003.

³⁴⁹ See also trade.ec.europa.eu/doclib/docs/2006/november/tradoc_130596.pdf, www.amchamkorea.org, 2005 Annual Report KIPO (p. 23).

³⁵⁰ *Ibid.*

of a shared jurisdiction to review appeals from Patent decisions between the Patent Court and the High Courts);

- Amendment of the Copyright Act, as to protect the work authored by a juridical person as well 50 years from the death of the creator (instead of 50 years from the date the work is first published);
- Extension of the period of copyright protection from 50 to 70 years (in conformity with the majority of other industrialised nations);
- Shortening of lengthy trial procedures;
- Increasing enforcement action by government authorities, especially in cases of high quality counterfeits.

Annex V: Competition law aspects of cooperation in the field of R&D and IP

INTRODUCTION

1. Article 81 (1) EC Treaty prohibits any form of agreement and other collusive behaviour between undertakings that appreciably restrict or are intended to restrict competition.
2. Agreements on the joint execution of research work or the joint development of the results of the research, up to but not including the stage of industrial application, as well as technology transfer agreements will usually improve economic efficiency and generally do not fall within the scope of Article 81 (1) EC Treaty. In certain circumstances, however, such as where the parties agree not to carry out other research and development (hereinafter: "R&D") in the same field, thereby forgoing the opportunity of gaining competitive advantages over the other parties, or when a patent licensing agreement's object restricts a party's ability to determine its prices when selling products to third parties, such agreements may fall within Article 81 (1) EC Treaty.³⁵¹
3. For agreements falling under Article 81 (1) EC Treaty, the Commission or the Council may exempt certain types of agreements from the general prohibition in Article 81 (1) by virtue of "block exemption regulations". For example, Regulation 2659/2000 on the application of competition law to research and development agreements³⁵² and Regulation 772/2004 on the application of competition law to technology transfer agreements.³⁵³

³⁵¹ Preamble of Commission Regulation (EC) No 2659/2000 of 29 November 2000 on the application of Article 81 (3) of the Treaty to categories of research and development agreements, Official Journal L 304 (2000), point 3 and Commission Regulation (EC) No 772/2004 of 27 April 2004 on the application of Article 81 (3) of the Treaty to categories of technology transfer agreements, Official Journal L 123 (2004), preamble points 5-6 and Article 4(1)(a).

³⁵² Commission Regulation (EC) No 2659/2000 of 29 November 2000 on the application of Article 81 (3) of the Treaty to categories of research and development agreements, Official Journal L 304 (2000).

³⁵³ Commission Regulation (EC) No 772/2004 of 27 April 2004 on the application of Article 81 (3) of the Treaty to categories of technology transfer agreements, Official Journal L 123 (2004).

R&D AGREEMENTS

4. As underlined in Article 163(2) EC Treaty, cooperation between undertakings in research and technological development represents an essential tool in making Community industry internationally competitive. Collaboration in R&D may bring significant advantages, including a more efficient allocation of tasks and resources and the likelihood of earlier breakthroughs. However, an agreement which restricts the parties' freedom in R&D or which prevents one party obtaining a competitive advantage in R&D over the other is likely to restrict the competition.³⁵⁴

5. In 1985, the European Commission summarised the factors weighing on each side as follows:

"R&D collaboration has various economic advantages:

- (i) Investment in R&D can be kept to a minimum. Economies of scale can be achieved.*
- (ii) Research budgets can be made to go further and risks spread by sharing the costs and benefits of a project between several firms or spreading a given sum over a series of relatively independent projects.*
- (iii) Cross-frontier R&D collaboration within the Community can help to open up national markets. (...). International R&D collaboration can enlarge markets and supply for the products (high technology or otherwise) incorporating the results of the joint research to a Community or even world scale.*

But the economic effects on R&D are not always wholly beneficial:

- (i) Powerful firms may enter into R&D agreements with potentially very innovative rivals in order to be able to control technological progress. In other cases, R&D collaboration may raise entry barriers to non-participating competitors.*
- (ii) R&D collaboration can also facilitate coordination of pricing and production and enable abnormal profits to be made from innovations. Such dangers are greatest where, as it is frequently the case in the Community, there are non-tariff barriers between national markets. In such cases, cross-frontier collaboration at the*

³⁵⁴ Bellamy & Child, European Community Law of Competition, Sweet & Maxwell, 2001, p. 315.

*R&D stage may give way to geographical division of the market on national lines for the product resulting from the R&D.*³⁵⁵

6. Below four questions will be addressed:
 - A. When will an R&D agreement not fall under Article 81 (1) EC Treaty?
 - B. When will an R&D agreement fall under Article 81 (1) EC Treaty?
 - C. When will an R&D agreement falling under Article 81 (1) EC Treaty be exempted under Regulation 2659/2000?
 - D. Calculation of parties' market share.

A. Agreements that generally do not restrict competition

7. In general Article 81 (1) EC Treaty should not apply to agreements relating solely to a stage prior to commercial exploitation and having as their sole object the cooperation on pure R&D projects, nor to the placing of R&D contracts, typically with specialised companies or research institutes, which are not active in the exploitation of the results.³⁵⁶
8. The Guidelines on the applicability of Article 81 to horizontal cooperation agreements³⁵⁷ provide that there are essentially three types of R&D agreements that generally do not restrict competition under article 81 (1) EC Treaty:
 - Agreements not involving joint exploitation
9. Those pure R&D agreements can only cause a competition problem, if effective competition with respect to innovation is significantly reduced.³⁵⁸
 - R&D cooperation between non-competitors
10. R&D cooperation between non-competitors does generally not restrict competition.³⁵⁹ However, the Guidelines state that even R&D agreements between non-competitors may fall under Article 81 (1) EC Treaty when the

³⁵⁵ Fifteenth report on Competition Policy (1985), point 282.

³⁵⁶ Bellamy & Child, European Community Law of Competition, Sweet & Maxwell, 2001, p. 317.

³⁵⁷ Guidelines on the applicability of Article 81 to horizontal cooperation agreements, Official Journal C 3 (2001), p. 2.

³⁵⁸ Guidelines, para. 58.

³⁵⁹ Guidelines, para. 56.

agreement leads to foreclosure, i.e. if it relates to an exclusive exploitation of results and if it is concluded between firms, one of which has significant market power with respect to key technology.³⁶⁰

- Out-sourcing

11. Due to the complementary nature of the cooperating parties in these scenarios, Article 81 (1) does not apply.³⁶¹

B. Agreements that generally restrict competition

12. A restrictive agreement is an agreement between undertakings whose objective is to limit or eliminate competition between them in order to increase the prices and profits of the undertakings concerned without producing any objective counterbalancing advantages. In practice, these agreements usually entail price-fixing; production quotas; sharing markets, customers or geographical areas; restricted access to R&D results; or a combination of these practices. Such agreements damage consumers and society as a whole since the undertakings involved set prices higher than they would in conditions of free competition.³⁶²

13. The following agreements will generally fall under Article 81 (1) EC Treaty:

- Restrictions on innovation³⁶³

14. If the effect of the agreement between potential competitors is that *de facto* the parties will no longer conduct research independently of one another, the agreement will restrict competition.

- Restricted access to the results³⁶⁴

15. Unless justifiable by objective reasons such as unequal contributions to the joint R&D, provisions whereby the parties agree to pay royalties to each other may infringe Article 81 (1) EC Treaty.

³⁶⁰ Guidelines, footnote 30.

³⁶¹ Guidelines, para. 57.

³⁶² <http://europa.eu/scadplus/leg/en/lvb/l26102.htm>

³⁶³ Van Bael & Bellis, *Competition law of the European Community*, 4th edition, Kluwer Law International, 2007, p. 491.

³⁶⁴ Bellamy & Child, *European Community Law of Competition*, Sweet & Maxwell, 2001, p. 318.

- Restricted exploitation of results³⁶⁵
16. An agreement will fall under Article 81 (1) EC Treaty if the parties accept restrictions on their ability to exploit the results of the joint research.
- Disguised cartel
17. If the true object of an agreement is not R&D but the creation of a disguised cartel, i.e. otherwise prohibited price fixing, output limitation or market allocation, it falls under Article 81 (1).³⁶⁶

C. Block exemption R&D agreements

18. Regulation 2659/2000 has been adopted by the European Commission because cooperation in the field of research and development is often essential to innovation, particularly in high technology sectors where the technical and financial risks are high. Not only does such cooperation enable firms to share their risks, but it also allows firms with complementary technologies to avoid costly duplication of efforts and promotes economies of scale.³⁶⁷
19. R&D agreements that fulfil the conditions of Regulation 2659/2000 will be exempted from the application of Article 81 (1) EC Treaty.³⁶⁸

³⁶⁵ Bellamy & Child, *European Community Law of Competition*, Sweet & Maxwell, 2001, p. 319.

³⁶⁶ Guidelines, para. 59.

³⁶⁷ Van Bael & Bellis, *Competition law of the European Community*, 4th edition, Kluwer Law International, 2007, p. 487.

³⁶⁸ Where an agreement falls within Article 81 (1) EC Treaty and outside the exemption of Regulation 2659/2000, an individual exemption under Article 81 (3) EC Treaty will be necessary. This requires the parties to show that the agreement:

- (i) contributes to improving the production or distribution of goods or to promoting technical or economic progress;
- (ii) allows consumers a fair share of the resulting benefit;
- (iii) does not impose restrictions that are not indispensable to the attainment of those objectives; and
- (iv) does not afford the parties the possibility of eliminating competition in respect of a substantial part of the products in question.

20. Regulation 2659/2000 basically exempts two types of agreements having as their main purpose the joint R&D:
- agreements for joint R&D; and
 - agreements for joint exploitation of the results of R&D jointly carried out pursuant to a prior agreement between the same undertakings.³⁶⁹
21. The exemption only applies if six threshold conditions are met.³⁷⁰ The first four conditions are:
- i. All the parties must have access to the results of the joint R&D for the purposes of further research or exploitation;³⁷¹
 - ii. Where the research and development agreement provides only for joint research and development, each party must be free to exploit the results independently;³⁷²
 - iii. Any joint exploitation must relate to results (i) which are protected by intellectual property rights or constitute know-how, (ii) which substantially contribute to technical or economic progress and (iii) the results must be decisive for the manufacture of the contract products or the application of the contract processes;
 - iv. Undertakings charged with manufacture by way of specialization in production must be required to fulfill orders for supplies from all the parties, except where the research and development agreement also provides for joint distribution.

³⁶⁹ Van Bael & Bellis, *Competition law of the European Community*, 4th edition, Kluwer Law International, 2007, p. 494-495.

³⁷⁰ Article 3 Regulation 2659/2000.

³⁷¹ However, research institutes, academic bodies, or undertakings which supply research and development as a commercial service without normally being active in the exploitation of results may agree to confine their use of the results for the purposes of further research (Article 3(2) of Regulation 2659/2000).

³⁷² Such right to exploitation may be limited to one or more technical fields of application, where the parties are not competing undertakings at the time the research and development agreement is entered into (Article 3(3) of Regulation 2659/2000).

22. The two last conditions³⁷³ are a market share threshold and a duration threshold:
- v. Where the parties are not (potential) competitors, the agreement applies for the duration of the R&D phase, and if there is joint exploitation, for at least seven years³⁷⁴ after the products are first placed on the market;
 - vi. Where at least two of the parties are (potential) competitors the exemption will apply for the same period only if, at the time the research and development agreement is entered into, the combined market share of the participating undertakings does not exceed 25 % of the relevant market for the products capable of being improved or replaced by the contract products.
23. R&D agreements that fulfill these six conditions but that include hardcore restrictions will not be exempted. The hardcore restrictions are territorial restrictions, customer restrictions, restrictions on R&D carried out independently or with third parties, no-challenge clauses, output limitations, price-fixing and the requirement not to grant licenses to third parties.³⁷⁵

D. Market share

24. Exemption under Regulation 2659/2000 requires that competitors do not have a market share above 25% on the relevant market.
25. The question we need to address is how to calculate this market share. In this respect, The European Commission has adopted a Notice on the definition of the relevant market for the purposes of Community competition law.³⁷⁶
26. The Notice states that the relevant market combines the product market and the geographic market, defined as follows:
- a relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer by reason of the products' characteristics, their prices and their intended use;

³⁷³ Article 4(1) Regulation 2659/2000.

³⁷⁴ The exemption shall continue to apply as long as the combined market share of the participating undertakings does not exceed 25 % of the relevant market for the contract products. Article 4(3) Regulation 2659/2000.

³⁷⁵ Article 5 Regulation 2659/2000 and Van Bael & Bellis, *Competition law of the European Community*, 4th edition, Kluwer Law International, 2007, p. 501-505.

³⁷⁶ Official Journal C 372 (1997) p. 5-13.

- a relevant geographic market comprises the area in which the firms concerned are involved in the supply of products or services and in which the conditions of competition are sufficiently homogeneous.³⁷⁷
27. It is not always easy to define the relevant market on the basis of the Notice. A broad case-law developed by the European Commission constitutes a very useful source of information to determine the relevant market.
28. With regard to the shipbuilding industry the Commission has adopted a few decisions that can be very helpful to verify whether the combined market share of undertakings wishing to enter into a R&D agreement exceeds the 25% threshold.
29. For example, in 2006 the Commission defined a market for commercial shipbuilding in general that could be divided into several separate product markets according to the main groups of ships such as oil tankers, bulk carriers, container ships, product and chemical carriers, LNG tankers, LPG tankers, roll-on roll-off vessels, ferries, cruise ships, offshore-specialised vessels etc. Whether there could be a further differentiation with the market for repair and conversion of commercial vessels has so far been left open by the Commission, but it is likely that the Commission will accept such a differentiation.³⁷⁸ The Commission considered that most of these product markets are global in scope.³⁷⁹ The Commission has also defined a separate market for naval vessels that could be divided into several segments and that could be differentiated from the markets for assembly for material packages for naval vessels and the market for repair and minor conversions of naval vessels.³⁸⁰

³⁷⁷ <http://europa.eu/scadplus/leg/en/lvb/l26073.htm>.

³⁷⁸ Decision of 25 April 2002, Case No Comp/M.2272 – HDW/Ferrostaal/Hellenic Shipyard.

³⁷⁹ Decision of 27 March 2006, Case No COMP/M.4104 – Aker Yards / Chantiers de l'Atlantique. The Commission considers that the market for ferries is at least European-wide and very likely global.

³⁸⁰ Decision of 25 April 2002, Case No Comp/M.2272 – HDW/Ferrostaal/Hellenic Shipyard. These markets are national in scope when domestic producers exist.

TECHNOLOGY TRANSFER AGREEMENTS

30. Even if the European Commission states that technology transfer agreements (hereinafter: “TFAs³⁸¹”) “will usually improve economic efficiency and be pro-competitive as they can reduce duplication of research and development, strengthen the incentive for the initial research and development, spur incremental innovation, facilitate diffusion and generate product market competition”,³⁸² the exercise of intellectual property rights or of contractual rights in accordance with limitations or restrictions in a license may infringe Article 81 (1) EC Treaty.
31. For the purpose of this section, TFAs can be divided in four categories:
- A. TFAs that do not restrict competition;
 - B. TFAs that do restrict competition and qualify for an exemption under the Block exemption TFAs;
 - C. TFAs that do restrict competition and do not qualify for an exemption under the Block exemption TFAs;
 - D. Patent pooling agreements.

³⁸¹ A TFA means a patent licensing agreement, a know-how licensing agreement, a software copyright licensing agreement or a mixed patent, know-how or software copyright licensing agreement, including any such agreement containing provisions which relate to the sale and purchase of products or which relate to the licensing of other intellectual property rights or the assignment of intellectual property rights, provided that those provisions do not constitute the primary object of the agreement and are directly related to the production of the contract products; assignments of patents, know-how, software copyright or a combination thereof where part of the risk associated with the exploitation of the technology remains with the assignor, in particular where the sum payable in consideration of the assignment is dependent on the turnover obtained by the assignee in respect of products produced with the assigned technology, the quantity of such products produced or the number of operations carried out employing the technology, shall also be deemed to be technology transfer agreements (Article 1(b) of Commission Regulation (EC) No 772/2004 of 27 April 2004 on the application of Article 81 (3) of the Treaty to categories of technology transfer agreements, Official Journal L 123 (2004)).

³⁸² Preamble of Commission Regulation (EC) No 772/2004, point 5.

A. TFAs that do not restrict competition

32. An agreement falls beyond the scope of Article 81 (1) EC Treaty when:³⁸³
- it contains no provisions that restrict competition; or
 - the restrictions are ancillary to the opening of new markets; or
 - the agreement is of minor importance.³⁸⁴

B. TFAs that do restrict competition and qualify for an exemption under the Block exemption TFAs

33. To be exempted of the application of Article 81 (1) EC Treaty, a TFA:
- (i) must be limited to two parties,³⁸⁵
 - (ii) must concern the production of the contract products.³⁸⁶
34. Where the undertakings party to the agreement are competing undertakings, the exemption shall apply on condition that the combined market share of the parties does not exceed 20 % on the affected market.
35. Where the undertakings party to the agreement are not competing undertakings, the exemption shall apply on condition that the market share of each of the parties does not exceed 30 % on the affected market.³⁸⁷

³⁸³ Van Bael & Bellis, *Competition law of the European Community*, 4th edition, Kluwer Law International, 2007, p. 622.

³⁸⁴ In the Commission's view, Article 81 (1) EC Treaty does not apply to agreements between competitors where the parties' aggregate market share does not exceed 10% (15% between non-competitors) (Commission Notice on agreements of minor importance which do not appreciably restrict competition under Article 81 (1) EC Treaty, Official Journal C 368 (2001).

³⁸⁵ Nevertheless, the European Commission shall analyse multilateral agreements in a manner similar to the way it analyses two-party agreements (Guidelines on the application of Article 81 EC Treaty to TFAs, Official Journal C 101 (2004), point 40.

³⁸⁶ Article 2 of Commission Regulation (EC) No 772/2004.

³⁸⁷ Article 3(1) and (2) of Commission Regulation (EC) No 772/2004. The market share of a party on the relevant technology market is defined in terms of the presence of the licensed technology on the relevant product market. A licensor's market share on the relevant technology market shall be the combined market share on the relevant product market of the contract products produced by the licensor and its licensees (Article 3(3))

C. TFAs that do restrict competition and do not qualify for an exemption under the Block exemption TFAs

36. Where a TFA caught by Article 81 (1) EC Treaty falls outside the scope of the Block exemption, then an individual assessment of the TFA will have to be carried out by the parties to determine whether the TFA merits an individual exemption under Article 81 (3) EC Treaty.³⁸⁸

D. Patent pooling agreements

37. Pools between actual or potential competitors which bundle competing technologies may raise serious competition concerns. They generally do not fall under the framework of the Block exemption TFAs because they are not concluded for the manufacture or provision of contract products, but instead for agreeing to grant bundled licenses to third parties or for supporting an industry standard which is open for the industry concerned.³⁸⁹
38. Pooling technologies required to produce the product or carry out the process to which the technologies relate (“complementary technologies”) shall usually fall outside the scope of Article 81 (1) EC Treaty, provided that the pool includes only essential technologies. Where non-essential but complementary patents are included in the pool there is a risk of foreclosure of third party technologies and the agreement is likely to be caught by Article 81 (1) where the pool has a significant position on any relevant market.³⁹⁰
39. Pools of substitutable technologies generally infringe Article 81 (1) EC Treaty and it may not always be possible to satisfy the (rather strict) conditions for exemption.³⁹¹
- they must be indispensable;

³⁸⁸ This requires the parties to show that the agreement:

- (i) contributes to improving the production or distribution of goods or to promoting technical or economic progress;
- (ii) allows consumers a fair share of the resulting benefit;
- (iii) does not impose restrictions that are not indispensable to the attainment of those objectives; and
- (iv) does not afford the parties the possibility of eliminating competition in respect of a substantial part of the products in question.

³⁸⁹ Ritter, Braun, *European Competition Law: A Practitioner’s Guide*, 3rd Edition, Kluwer Law International, 2004, p. 842-844 and Guidelines on the application of Article 81 EC Treaty to TFAs, *Official Journal C* 101 (2004), points 215-235.

³⁹⁰ Guidelines, points 220-221.

³⁹¹ Guidelines, point 219.

- they must not extend to non-essential technologies;
 - they must not extend to the exchange of sensitive information, such as price or output data, which are likely to facilitate collusion;
 - they must be open and non-exclusive;
 - access must be granted to third parties in a non-discriminatory manner;
 - the parties must not be prevented from creating, or participating in, alternative pools; and
 - the licence agreements concluded between the pool and third parties must satisfy the conditions of the Block exemption TFAs.³⁹²
40. Technology pools for the purpose of creating industry standards are often pro-competitive, but can infringe Article 81 (1) EC Treaty when the members have a strong collective market position and create difficult market entry conditions for third parties. Such pools shall be exempted only if the pooled technologies are selected in an objective way and if they are non-exclusive.³⁹³

³⁹² Guidelines, points 222-234 and Ritter, Braun, *European Competition Law: A Practitioner's Guide*, 3rd Edition, Kluwer Law International, 2004, p. 844.

³⁹³ Guidelines, points 225-233.

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