Preparation process for the Chinese customs

China Compulsory Certificate

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**Abstract**
Metso Paper, Inc. has been having occasional problems with the Chinese customs because of insufficient documentation has been provided for the customs. Lack of the China Compulsory Certificate (CCC) has been causing delays in delivery times. The goal of the thesis was to find better and more efficient way to prepare for the Chinese customs.

For gathering information to analyze the situation and to find the final conclusions, it was required to do theoretical research, interviews and gain practical experience of exporting goods to China. Theoretical research was done with aid of literature, interviews were conducted to Metso Paper, Inc. Service employees and practical experience was gained in Metso Paper, Inc. Service through practical training period in early 2011 as a forwarding coordinator trainee.

Through interviews it was clear that better and more efficient information chain for the CCC was needed to be developed. The information flow was assigned in a way to reduce relatively the delay times caused by applying the CCC. Also proper destination for storing the CCC documents was decided to be built up.

The improved preparation process for Chinese customs for the goods that require the CCC will be more efficient. Possibility for delaying in delivery times will be reduced and required resources are reduced.

**Keywords**
China Compulsory Certificate, CCC, Customs, Customs process,
# Contents

1 Introduction ............................................................................................... 4  
1.1 Background............................................................................................ 4  
1.2 Purpose of the thesis ............................................................................. 5  
  1.2.1 Internal Information Flow ............................................................... 5  
  1.2.2 Document Organizing ................................................................. 6  
1.3 Methodology ......................................................................................... 7  
1.4 Commission Company ......................................................................... 7  
  1.4.1 Metso Corporation ............................................................... 7  
  1.4.2 Metso in China ............................................................................. 10  
2 Theory Background .................................................................................. 10  
  2.1 Logistics ............................................................................................... 10  
    2.1.1 Definition of Logistics ............................................................... 10  
    2.1.2 Logistics in China ...................................................................... 11  
    2.1.3 Definition of Supply Chain Management .................................. 12  
  2.2 Terms of Delivery ............................................................................... 13  
3 Customs Process ....................................................................................... 17  
  3.1 Definition of Customs ......................................................................... 17  
  3.2 Customs Process ................................................................................. 18  
  3.3 Documentation and markings for customs and shipping .................... 20  
4 Analysis .................................................................................................... 22  
  4.1 Internal Information Flow ................................................................. 22  
  4.2 CCC Documentation Storing ............................................................. 23
5 Conclusion ..........................24
  5.1 Internal Information Flow .........................24
  5.2 CCC Documentation Storing ....................26
  5.3 Instructions ..................................27
  5.4 Areas of Development ..........................27
  5.5 Results ....................................28
References ...........................................29
Appendices .........................................31
  Appendix 1: Countries with Metso operations ....31
  Appendix 2: Commercial Invoice (Sample) ..........32
  Appendix 3: Proforma Invoice (Sample) ..........33
  Appendix 4: Packing List (Sample) .............34
  Appendix 5: CCC Certification (Sample) .......35
  Appendix 6: CCC Mark (Sample) ...............36
  Appendix 7: IPPC Mark (Sample) ...............37
  Appendix 8: Non-wood certificate (Sample) ......38
  Appendix 9: ATA Carnet (Sample) .............39
  Appendix 10: Bill Of Lading (Sample) ..........40
  Appendix 11: Waybill (Sample) .................41
  Appendix 12: Products subject to China Compulsory Certificate .................42
Figures

Figure 1: Internal Information Flow for applying the CCC..6
Figure 2: Metso Personnell 2010.........................................9
Figure 3: Metso net sales by customer industry 2010......9
Figure 4: Improved Internal Information Flow for applying
the CCC........................................................................25

Tables

Table 1..............................................................................11
Table 2..............................................................................17
1 Introduction

1.1 Background

Metso Paper, Inc. is growing and strengthening its presence in Asia. China is Metso Paper’s biggest market in Asia. China’s growth measured in its Gross Domestic Product is expected to reach to 10% in 2011 and China’s Gross National Product is rising at an annual rate of 8%. China is building up and reforming its regulations and legislations all the time while growing as a one of the biggest industrial economies in the world. China has grown rapidly as a market area for Metso Paper. Within the last decade Metso Paper has almost doubled its net sales in China, in 2005 China was Metso’s fourth largest country in sales and in 2010 China was Metso Paper’s biggest country in sales. (Metso Paper growing in China, 2010.)

Companies have been facing challenges many times with the Chinese legislation when exporting goods to China. To export to China has been a major issue for many companies when planning expansion to China. The customs regulations are strict and China as a market is difficult. Production and supply in China is huge and the price limits in are low for. Products planned to be exported to China need to be quite unique for succeeding in the market. Metso Paper has been successful in the Chinese market. (Lee 2011)

The customs regulations have been increasing and more detailed information is needed to be provided for the customs. More detailed information and thorough informing is needed about the goods that are being exported. This has also affected the fact that the preparation process for the Chinese customs is requiring more and more resources. The Chinese customs are developing all the time and new requirements for the customs have been faced several times within recent years. The preparation for the customs has been occasionally hard to be managed efficiently as has been eliminating the unnecessary negative effect of the customs on the process of exporting to
China. Deficiencies in the preparation for the customs cause delays in delivery schedules and may cause additional costs. (Berkowitz 2005)

**China Compulsory Certificate**

China Compulsory Certificate (CCC) (see Appendix 5 and Appendix 6) is a safety and quality certification for the Chinese market. The CCC mark is required for both domestically manufactured products and products imported into China. The certification is needed for the Chinese customs and in the Chinese market for a large range of goods (see Appendix 12). The products that need the CCC are needed to be certified by the China National Regulatory Commission for Certification and Accreditation. The applying process for the CCC takes 1-3 months. The CCC system was established on the May 1, 2002, and it replaces the two older systems, CCIB and CCEE. The products that need the CCC are categorized in nineteen (19) main categories and these categories have subcategories. (What is CCC Mark?, 2009)

**1.2 Purpose of the thesis**

The study deals with the preparation process for the Chinese customs and the goal was to survey if it was possible to execute the preparing process more efficiently than it has been done so far. The internal information flow and document organization of the CCC were taken into consideration for a better performance than earlier.

**1.2.1 Internal Information Flow**

An indication for the need of the CCC has been received in the Forwarding Department of Metso Paper, Inc. Service when the product is going to be shipped to a internal customer in China. The certification is requested and if a valid certification does not exist it needs to be applied for. The Forwarding department needs to inform the Sales Department about the need for the product to be certified and Sales Department will forward this information to
the Purchasing Department. The Purchasing Department needs to have the certification from the supplier, because the manufacturer has the required information about the product for applying the certification. Once the supplier has the certification for the product, the information flow will be executed backwards. The applying process for the CCC takes a relatively long time, 1 to 3 months. (Metso Paper employees. Interviews 8.9.2011)

Figure 1: Internal Information Flow for applying the CCC

1.2.2 Document Organizing

The CCC documents have been passed on by email as attached files from one user to another and one department to another. Certifications are stored in users personal email folders and as a paper copy in file folders. The documents do not have a location where they could be stored with all the other similar documents. The certifications are processed more than once and possibly by some other user than at the first time. Time is spent for locating the correct documents when used more than once. (Metso Paper employees. Improvement discussions 7.11.2011)
1.3 Methodology

For gathering information to analyze the situation and to find final conclusions it was required to do theoretical research, conduct interviews, improvement discussions and also to gain practical experience was necessary. Information found during the research was needed to be analyzed thoroughly for to find solutions and an action plan for avoiding the same problems in the future.

The improvement discussions were conducted to Metso Paper employees who were involved in the supply chain and exporting and importing. The improvement discussions took place in the fall of 2011 in Jyväskylä, Finland. Theoretical data was gathered from e-mails, customs regulations, online publications and literature. Literature was gathered from libraries and from Metso Paper. Practical experience was gained in Metso Paper, Inc. Service through a practical training period in the early 2011 as a forwarding coordinator trainee.

1.4 Commission Company

1.4.1 Metso Corporation

History
Metso Corporation was established in 1999. It was created through the merger of two traditional Finnish industrial companies, Valmet Oy and Rauma Oy. The outcome from this merger was an equipment supplier for the global process industry, because Valmet Oy was a paper and board machine supplier and Rauma Oy operated within the fiber technology, rock crushing and flow control solutions. (The late 1990's - Metso is born, 2009)

History in China
Companies that eventually formed Metso have had interaction in the Chinese market since the 1950s. Valmet Oy made its first paper machine and pulp mill
deliveries to China and also Rauma Oy delivered crushing equipment
deliveries to China in the 1950s. In the 1970s Valmet Oy rebuilt of sack paper
and newsprint machines in China and Rauma Oy delivered a thermo
mechanical pulp plant to China. In the 1980s the Valmet-Xian joint venture for
manufacturing for paper machines was established and also deliveries of a
complete coal handling system and large grinding mills were made. In the
1990s the fiber technology representative office was established to Beijing,
China, the world’s first OptiConcept newsprint line is started in Nanping, China
and the first fully owned crusher plant in China. (Metso in China 2010)

Present Day
Metso is a global (see Appendix 1) supplier of process industry machinery and
systems as well as know-how and aftermarket services and is headquartered
in Helsinki, Finland. It supplies and provides services for pulp and paper
industry, rock and mineral processing, power, panelboard production and the
hydrocarbon and process industries. It is an international corporation
operating in several different areas of business (see Figure 3). Metso consists
of three reporting segments: Mining and Construction Technology, Energy and
Environmental Technology, Paper and Fiber Technology. It has engineering,
production, procurements, services business, sales and other operations in
more than 50 countries. It employs almost 29 000 (see Figure 2) professionals
in over 100 countries. The net sales in 2010 were EUR 5,552 million and its
shares are listed on NASDAQ OMX Helsinki Ltd. (Metso in brief 2011)

Metso Paper, Inc.
Metso Paper is a part of Metso Corporation. Its main products include pulp,
chemical pulp and mechanical pulp production lines, paper, board and tissue
machines and industrial disk production lines. Also Metso Paper manufactures
spare and wear parts for its main products. Metso Paper, Inc. Service is
providing expert and maintenance services for the customer. Metso Paper,
Inc. net sales in 2010 were EUR 1,141 million and Metso Paper, Inc. Service
net sales in 2010 were EUR 766 million. (Paper and Fiber Technology 2011)
Present day in China

In the 2000s when Valmet Oy and Rauma Oy had joined their forces as a Metso the expansion in China began. The major Metso locations in China
were established in the 2000s e.g. the Pulp and paper service center in Wuxi, the Logistics center in Shanghai, a new crushers manufacturing plant in Tianjin, a paper and board workshop in Jading, the Pulp and paper service center in Guangzhou, and the Pulp and paper service center in Zibo. In more recent times Metso has established a Metso Technology Center in Shanghai. (Metso in China 2010)

1.4.2 Metso in China

Metso Corporation employs approximately 2,810 professionals serving customers in China, including the Chinese joint venture, Valmet-Xian. Metso runs five manufacturing plants and shares one joint venture with local partners. China has grown rapidly as a market area for Metso. Within 4 years Metso has almost doubled its net sales in China, in 2005 China was Metso’s fourth largest country in terms of net sales with EUR 239 million and in 2009 China was Metso’s second biggest country in terms of net sales with EUR 334 million and the total sales to China in 2009 was EUR 583 million (Metso in China 2010)

2 Theory Background

2.1 Logistics

2.1.1 Definition of Logistics

Logistics is the way for managing the flow of goods between the point of origin and finally the point of disposal. The process starts from collecting the raw materials, the manufacturing, providing the goods to the customer, usage of
the goods and in the end of the process is the correct disposal of the goods as agreed with the customer. The process must respect the agreement made with the customer and requests placed by the customer for the process. Request usually cover issues like correct timing, correct place, correct quantity, right product and right condition and costs of the product. The essential aspect for logistics is to minimize costs and manage the flow of goods as efficiently as possible. The costs consist of purchasing raw materials, handling costs, warehousing costs, manufacturing costs and shipping costs. (Waters 2007, 1-3.)

2.1.2 Logistics in China

Since China became a member of World Trade Organization (WTO) in 2001, its industrial growth has been fast and it has became one of the largest economies in terms of Gross Domestic Product (GDP) in the world. Because of this China’s logistics sector has also been expanding so significantly that it has never been seen before. With such a significant growth of logistics processes within a relatively small period of time, the efficiency of China’s logistics has been a great challenge to the government of China (see Table 1). Compared to the other great industrial economies such as Japan, the European Union and United States, the spending on logistics has been relatively higher, because of developing of a new business area to a great need of efficient logistics processes. (Waters 2007, 391-395.)

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Logistics spending as percentage of GDP %</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>20</td>
</tr>
<tr>
<td>Japan</td>
<td>14</td>
</tr>
<tr>
<td>European Union</td>
<td>10-13</td>
</tr>
<tr>
<td>United States</td>
<td>10.3</td>
</tr>
</tbody>
</table>

Table 1 (State Development and Planning Commission (SDPC), 2006)
2.1.3 Definition of Supply Chain Management

Supply Chain Management (SCM) is the combination of the guidelines provided by the science of logistics and the chosen means to implement fluent and efficient flow of material. Supply Chain Management can be thought as a logistics management in practice. Logistics provide the knowledge for efficient decision-making, but making the decisions and the management of the effects by the decisions made is Supply Chain Management. The chain starts from finding the best raw components for your need and these components need to make a product or service to be delivered to the customer. Five (5) basic components are needed to be taken under consideration for successful and efficient supply chain management.

1. For a company to practice efficient SCM it needs a strategic plan for managing all the resources that are prior to responding to customers demand about the product or the service offered. For building up a good quality strategic plan one needs to have developed a monitoring system for monitoring the level of efficiency of the supply chain.

2. The source for the raw components is needed to be carefully chosen and succeeding in choosing the best suppliers is in developing metrics for monitoring pricing lists, delivery accuracy, payment processes and relationships.

3. Monitoring the production of an end product for the customer is the most metric-intensive information for SCM. A company needs to monitor production output and quality levels constantly.

4. A network for product distribution is needed to be carefully built-up for an efficient product delivery for customer: order collecting from customers, network of warehouses, use of best freight forwarders and setting up an invoicing system for receiving payments. These are essential functions for a working product distribution network.

5. Reversed product distribution is also needed to be considered. A responsive and flexible network for returning malfunctioning products back from the customer or give support for the customer who is having problems with the delivered product. (Gourdin 2006, 4-8)
2.2 Terms of Delivery

In the international movement of goods, precise and exact regulations are highly used and needed for ensuring rightful results in various situations. Goods are sold internationally in large quantities and the variety and volume of the goods is large; this increases challenges for forwarding the goods in the promised condition. Misunderstandings and costly disputes when selling terms are not adequately respected are likely to occur. Incoterms are defining legal responsibilities of buyers and sellers for delivering goods respecting the sales contracts. Legal complications are reduced highly when both parties have agreed to a specific agreement of the responsibilities during forwarding the cargo.

Incoterms
The Incoterms (see Table 2) rules explain a set of three-letter trade terms reflecting business-to-business practice in contracts for the sale of goods. The Incoterms rules describe mainly the tasks, costs and risks involved in the delivery of goods from sellers to buyers. The terms are needed to be chosen carefully in every situation to ensure the correct agreement for both parties of the sales contract. The terms are suggested to be specified as precisely as possible, for example specifying the place or port that the particular term is valid for each party. The terms clarify responsibilities of the parties in different points of the forwarding process. The responsibilities for the parties are for example freight costs, terminal-, packaging-, handling charges and insurance coverage.
(Incoterms 2010, 120-127)

Rules for any mode or modes of transport
EXW, EX Works
FCA, Free Carrier
CPT, Carriage Paid To
CIP, Carriage and Insurance Paid To
DAT, Delivered At Terminal
DAP, Delivered At Place
DDP, Delivered Duty Paid

Rules for sea and inland waterway transport
FAS, Free Alongside Ship
FOB, Free On Board
CFR, Cost and Freight
CIF, Cost Insurance and Freight

Examples of use
EXW Jyväskylä, Incoterms 2010
The seller is only responsible for making the goods available at the seller’s premises. The seller has no obligation to the buyer to load the goods. Buyer bears the full risk from the seller’s premises to the destination. In this case buyer will arrange the loading in the seller’s premises in Jyväskylä, Finland and when the loading starts, the risk has been transferred from the seller to the buyer.

FCA Helsinki, Incoterms 2010
The seller is responsible for delivering the goods to the freight carrier or another agent nominated by the buyer for to be handling the goods to the destination or premises specified. When the seller has delivered the goods to this agreed destination specified and the loading has taken place the risk has been transferred from the seller to the buyer. In this case the seller will deliver the goods to agreed destination in Helsinki, Finland to the freight carrier nominated by the buyer.

CPT Shanghai, Incoterms 2010
The seller delivers the goods to the carrier at an agreed place of delivery and pays for transport to the named destination. Risk is transferred at the place of delivery, whereas seller pays for transport to the destination. In this case the seller is responsible to arrange the goods to the agreed destination in Shanghai, China by the freight carrier nominated by the seller and will pay the
freight to this specified destination. The buyer will arrange the delivery for the goods from this destination to the point of disposal and will pay the freight.

CIP Shanghai, Incoterms 2010
The seller delivers the goods to the carrier at an agreed place of delivery and pays for transport and insurance to the named destination. Risk is transferred at the place of delivery, whereas seller pays for transport and insurance to the destination. In this case the seller is responsible to arrange the goods to the agreed destination in Shanghai, China by the freight carrier nominated by the seller. The seller is required to obtain only on minimum cover, so the buyer might need to have more insurance coverage for better protection of the goods.

DAT Shanghai, Incoterms 2010
The seller delivers the goods unloaded at a specified place inside the agreed terminal. Risk is transferred as soon as the goods have been unloaded. In this case the seller is responsible to deliver the goods to the agreed destination in Shanghai, China by the freight carrier nominated by the seller and unload them for disposal of the buyer. “Terminal” can be warehouse, distribution center, container yard or road, rail or air cargo terminal.

DAP Shanghai, Incoterms 2010
The seller delivers the goods to the disposal of the buyer on the arriving means of transport at the agreed place. Seller assumes the risk until the goods are made ready for unloading from the arriving means of transport. In this case the seller is responsible to deliver the goods to the agreed destination in Shanghai, China by the freight carrier nominated by the seller and unload them for disposal of the buyer.

DDP Shanghai, Incoterms 2010
The seller is responsible for all the costs, paying any duty and making the goods available to the buyer. Risk is transferred as soon as the buyer has access to the goods ready for unloading at the agreed destination. In this case
the seller is responsible to deliver the goods for disposal of the customer at the agreed destination in Shanghai, China. The seller will pay all the costs.

FAS
The seller is responsible for delivery of the goods at the quay alongside the ship. From this point onwards, risk lies with the buyer.

FOB
The seller is responsible for delivery of the goods loaded on board the ship. Risk is transferred as soon as the goods have been set down inside the ship.

CFR
The seller covers cost of freight, duty unpaid, to the named port of destination. Risk is transferred as soon as the goods have been set down inside the ship.

CIF
The seller covers costs of insurance and freight, duty unpaid, to the named port of destination. Risk is transferred as soon as the goods have been set down inside the ship.

(Incoterms 2010, 131-233)
Table 2

3 Customs Process

3.1 Definition of Customs

Customs is an authorized party and a government-defined agency for inspecting legality and gathering data of imported and exported goods. National customs are acting under the World Customs Organization (WCO). WCO is internationally responsible for developing tools, guidelines and regulations for customs establishments around the world to operate on. The management of customs duties is the core function for the customs to ensure the correct flow of goods in foreign trade. The customs duties and regulations are based on national legislation and international agreements for ensuring
correct foreign trade and the manufacturing of goods related to customs duties, taxes and charges.

Every country has its own customs establishment. The customs establishment consists of the facilities and personnel, situated in the exit points where goods can be carried out from the current country that they are situated in. These facilities and personnel are operated for securing the correct code of conduct of importing and exporting businesses. (World Customs Organization 2011)

**Customs functions**

The Customs establishment is not only responsible for collecting customs duties and taxes, but also to prevent the smuggling of drugs and other hazardous substances and financial crime. Subjects for the customs to control are goods, vehicles and passengers. The customs controls will be at the external and internal borders and inland. Under the supervision the most important is to prevent drugs, firearms and ammunition, dangerous weapons, endangered animal and plant species and their products in the import of animal and plant diseases, national cultural treasures, the export and criminal money laundering. In addition, Customs monitor that the import and export restrictions are met and the goods are declared correctly in terms of customs, and that the various duties are paid correctly. (Tullihallitus 2010)

Customs is also gathering data about the imported and exported goods. The documents are needed to give information about the content of the packages. For traded products customs are inspecting that their specified classification is correct. Classification is made with the help of the Harmonized Commodity Description and Coding System (HS). The Harmonized System is globally used and standardized for customs to collect the information about imported and exported materials by their standards maintained by the WCO. (World Customs Organization 2011)

**3.2 Customs Process**
The Customs process starts from the country of origin of the product and ends to the destination country, usually to the country where the product is supposed to be used. Between these two destinations customs is taking over the management of the goods from the freight carriers twice, when exported out from the country of origin and when imported to the country of destination. In these two points customs are involved in inspecting the contents of the shipment. The process starts when the consignor is preparing the goods for the freight carrier to take them into their custody and take the goods to the customs territory for inspection of the customs clearance. The consignor is responsible for providing all the needed information and documentation for the instance that is making the customs clearance.

Efficient and planned preparation for customs will reduce the risks of delay time in the customs and additional costs caused by insufficient information provided for the customs. (DHL International 2011)

**Customs Clearance & Customs Broking**

Globally, the duty rates, customs clearance and entry processes are different in different countries. When acting without knowledge of these factors, tariff classifications, value declaration and duty management may cause additional costs and complex situations with the customs.

**Customs Clearance**

Customs Clearance is the customs formalities made for the freight subjected to the procedure for authorization the freight when it is released from the customs control and enters in full disposal of the importer. The importer has provided all required charges, tariffs and other duties paid for the customs.

**Customs Broking**

Customs broking is an area of business where trained professionals provide their knowledge and services for ensuring efficient flow of goods through customs. The customs broker deals directly with the customs authorities in connection with the bringing of goods or removal of goods from the customs territory. The customs broker makes sure that the documentation for customs
clearance is up to date before the goods enter the customs territory for eliminating delays in the customs. (United Parcel Service of America, Inc 2011)

3.3 Documentation and markings for customs and shipping

The customs require certain documents for inspection and making the customs clearance for the contents of the shipment. These documents need to provide specified information about the contents of the shipments. The most basic requirements for the customs are detailed descriptions of every item in the shipment, the commercial value of each item and the total value package. (China Reference Guide: Practical Business and Shipping Information for U.S. Exporters)

**Commercial Invoice**

Commercial invoice (see Appendix 2) is most common document required in order to make customs clearance for the cargo when you are shipping outside of the free trade zone. Commercial invoice indicates the total value of the goods and item value of a single item for taxation. Also when shipped unique machine parts to China the commercial invoice does need to show the country of origin for the items. (Cornelius Bothma 2011)

**Proforma Invoice**

Pro-forma invoice (see Appendix 3) is an invoice what demonstrates what the final invoice will be when invoiced. It also indicates the commercial values of the goods in the cargo for customs clearance. Pro-forma invoice is often used when goods are going to be shipped without invoicing at that time, but the whole sales order is going to be invoiced collectively at the same time for the customer. (Cornelius Bothma 2011)

**Packing List**
Packing list (see Appendix 4) indicates the amount of packages in the shipment and detailed information about the packages. The packing list shows descriptions of the contents of the package and the amount of items, weight and dimensions of the package.

**CCC Mark**
China Compulsory Certification (see Appendix 5) mark (see Appendix 6) is needed to be attached on to a large range of products sold in Chinese market. The goods are mostly electrical products and these products are needed certified by the China National Regulatory Commission for Certification and Accreditation. (CCC-Mark.com 2011)

**IPPC Mark**
IPPC Mark (see Appendix 8) needs to be shown in packages made of solid wood. IPPC standard is build up and maintained by the International Plant Protection Convention (IPPC). The packaging materials, including pallets dunnage and crates, are needed to be treated in a way that the material is free of pests. The standard applies only to solid wood packaging materials (both coniferous and non-coniferous), but the standard does not apply to engineered wood materials (for example plywood). (Transport Information Service 2011)

**Non-wood certification**
Non-wood certification (see Appendix 8) needs to be used for the service of China entry and exit inspection and quarantine when packaging materials does not contain any solid wood packing materials. (Forestry Commission Great Britain 2011)

**ATA Carnet**
ATA Carnet (see Appendix 9) is international customs document what can be used for temporary importing to carnet countries. Temporary importing means that the goods are allowed in that particular country for certain period of time, defined by the validity of the carnet. ATA Carnet is usually valid for one year from the starting date. Exhibition goods, professional equipment (tools, etc.)
and commercial samples are allowed items to be imported and exported using ATA Carnet. (Suomen Huolintaliikkeiden Liitto ry 2010, 243)

**Bill Of Lading**

Bill of Lading (B/L) (see Appendix 10) is a legal document made between shipper and freight carrier. The B/L is detailing the type, quantity and destination of the shipments being carried. The B/L is also a receipt of the shipment and is valid when the goods are delivered to the predetermined destination. Document must be shipped always with the goods attached with the package or with person who is responsible for the freight carrying and handling the goods. The B/L must be signed by the shipper, the carrier and shipper for correct inspection of the process. (Suomen Kuljetusopas 2011)

**Waybill**

Waybill (WB) (see Appendix 11) is a document made for the cargo providing details and instructions and information relation to the shipment and about the goods in inside. WB will also show the names of consignor and consignee, point of origin, destination and route of the shipment. Air Waybill (AWB) will also provide information about the destination airport, flight numbers and flight time. (Suomen Kuljetusopas 2011)

### 4 Analysis

As mentioned earlier (see 1.3 Methodology) that the improvement discussions and interviews were conducted during fall 2011 for Metso Paper, Inc. Service employees involved in supply chain of Metso Paper products in Chinese market. These improvement discussions and interviews were concerning Chinese customs regulations and China Compulsory Certifications.

#### 4.1 Internal Information Flow
More efficient flow of information about the Chinese customs regulations were needed to be found, because shipping times were effected by delays because of insufficient documentation provided for the Chinese customs. More frequent interaction and informing were desired about the changed requirements in Chinese customs. Information about specific actions for preparing for customs was needed to have earlier in the supply chain for gaining more efficient preparation for saving time. (Metso Paper employees. Interviews 8.9.2011)

For the CCC, the improvement discussions showed that there was no preparation process. The information flow about the need for the CCC was insufficient or it was provided too late. The information about the need for the CCC to a product was received when the product was supposed to be shipped. The forwarding department was not able to ship the goods until the CCC was received. If the goods were shipped without the CCC they were stuck in customs and were not released before the CCC was provided to the customs. The applying for the CCC takes relatively long time to get the goods certified for Chinese market. It takes from 1 to 3 months for a single product to be certified. The applying process was needed to get started as early stage of the supply chain as possible. (Metso Paper employees. Improvement discussions 7.11.2011)

Situations where the supplier was not willing to certify its products for Chinese market also had occurred. Because of the suppliers gradual movement of products to China may cause too big amount of work for having the products to be certified in just for Chinese market. (Metso Paper employees. Improvement discussions 7.11.2011)

4.2 CCC Documentation Storing
The certification documents were passed on by email as attached files from user to another and department to another. Certifications were stored in users personal email folders and in as a paper copy in file folders. (Metso Paper employees. Improvement discussions 7.11.2011)

Lack of proper data storage destination for unique customs documents has also been a major issue for ensuring the fluent preparation for the Chinese customs. It was clear that it has been difficult to manage all CCC documents in individuals private email folders and printed out certifications stored in a file folders were difficult to find for using later. The documents were lost easily when stored in email and lost for good if the responsible employee was not using the email account any more. The new certification was needed to be requested from the suppliers every time when certification could not be found. (Metso Paper employees. Improvement discussions 7.11.2011)

5 Conclusion

5.1 Internal Information Flow

The internal information flow in Metso Paper was needed to be arranged more systematically for eliminating delay times for shipping goods to the customer. The improvements are based on the information received from the improvement discussions of Metso Paper employees for making the internal information flow reach a more efficient level. The suggested information flow will be approved with every department.

The information about the need for the CCC is needed to be available as early as possible in the products supply chain. The customer’s purchase order is needed to contain this information. When the information about the CCC requirement is given in the customers purchase order, this information is received in the sales department and can be interacted on relatively more
early than previously. Through these actions, the applying for the CCC can be started before it is supposed to be shipped to the customer.

**The improved information chain for CCC**
The improved information chain (see Figure 4) for acquiring the CCC more efficiently. The internal customer has the information about the need for the CCC and will include this information in their purchase order which is going to be provided to the Metso Paper, Inc. Service sales department when placing the order for the product. The sales department receives the information from the customer in the customer’s purchase order and will give the information forward for applying the CCC if a valid CCC does not exist in the custody of Metso and in the CCC database. The sales department will provide the information about the need for the CCC to purchasing department in the purchasing assignment. The information will reach every point of the information chain and the information for the need of the CCC will be picked up from the purchasing department’s work queue as soon as the order is processed. The purchasing department will inform the supplier about the need for the CCC and that the certification is needed to be delivered when the product is ready for Metso Paper’s disposal. Once the purchasing department receives a valid CCC, it is able to create a datasheet for this product to the CCC database for the users to utilize. The purchasing department will forward the information of the valid CCC to the forwarding department. The forwarding department will be able to ship the product straight away with a valid CCC and the possibilities for delay times are reduced.
5.2 CCC Documentation Storing

The lack for CCC documentation storing location was planned based on the software platform that Metso Paper is utilizing globally for ensuring users to access the data from all over the world and anytime.

The database for storing the CCC documentation is planned in a way that everyone involved in material handling within the supply chain can access the data. The data was needed to be available easily and browsing through different parameters of data needed to be easy too. The data was needed to be available for the user by browsing through four major parameters: Item, Supplier, Author, Status and Expiration Date. When the user creates a new data page it needs to be filled in a way that all these parameters have been given a value. In the item parameter, the data are organized under the item code of each item. In the supplier parameter the data are organized under the supplier info provided by the author. Through the author parameter, the user
can browse all the data that the certain author has created to the database. In the status parameter the author is required to give information about the status of the CCC, whether the certification is applied, a valid certification is received or if the certification is expired. The expiration date parameter gathers all the data about the data where filled expiration date has expired.

5.3 Instructions

For ensuring the success of the improvements made for the CCC documentation storing, internal information flow and customs preparation process, proper instructions are needed for the support of the personnel involved. As instructions manual in a form of a presentation is created and old instructions concerning the CCC are updated for supporting a more efficient preparation process for the Chinese customs.

5.4 Areas of Development

For maintaining the benefits of improved information chain, it is required to execute as concluded earlier (see Chapter 5.2 Internal Information Flow). For reviewing this to be done, supervisors and employees need to interact frequently. Also observing the customers reliability on providing information about the need for the CCC is required for avoiding the delay times.

The CCC database needs upkeep from every user for gaining best results and as wide range of certifications as needed accessible for everyone. Employee should be considered for taking responsibility of answering questions and inquiries about the CCC database and to give instructions of the use of the database.

Automatic functions for the database should also be taken under consideration for developing the database. Automatic information impulse from the database to the author of the datasheet and possibly to the system.
This impulse should contain information about the expired certification. The system interacting with the database for making the applying for CCC continuous and automatic function. This could increase the possibility for continuance for to the CCC being valid. Combined datasheet of the products that will require the CCC in the future. The CCC could be applied as combined for several products simultaneously.

5.5 Results

Every link in the information chain needs to forward the information exact further on as planned in this thesis for gaining best results in the future. It is possible to reduce the delay times totally caused by the applying for the CCC.

Organized documentation storing will eliminate the possibility for missing certificates. It will also reduce the amount of used resources for locating and having the correct certificate for shipping the product. The organized preparation can reduce the additional costs caused by the customs can be reduced and the preparation can be executed more efficiently.
References


Metso Paper, Inc. Service employees. Improvement discussions in Jyväskylä 7.11.2011


Appendices

Appendix 1: Countries with Metso operations
Appendix 2: Commercial Invoice (Sample)

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Line Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PISTON</td>
<td>1</td>
<td>PCE</td>
<td>1,0</td>
<td>1,0</td>
</tr>
</tbody>
</table>

Commodity code: 84129080
Country of origin:

<table>
<thead>
<tr>
<th>NET</th>
<th>USD</th>
<th>1,0</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAT</td>
<td>0.00%</td>
<td>USD</td>
</tr>
<tr>
<td>Total</td>
<td>USD</td>
<td>1,0</td>
</tr>
</tbody>
</table>

VAT 0% supply outside EU
Appendix 3: Proforma Invoice (Sample)

![Proforma Invoice Sample](image)

---

**Contact person:**
Tuomas Mäenpää

**Invoice date:**
November 19, 2010

---

**Package Description/Marks and Numbers**

<table>
<thead>
<tr>
<th>Dimension(cm)</th>
<th>Gross Weight(kg)</th>
<th>Net Weight(kg)</th>
<th>Volume(km³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ TNT</td>
<td>40x30x20</td>
<td>3.2</td>
<td>0.024</td>
</tr>
<tr>
<td>123/456789</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Position and item**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Quantity and unit</th>
<th>Unit price</th>
<th>Currency</th>
<th>Discount</th>
<th>Line total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 ITMI</td>
<td>1 PCE</td>
<td>1.0 USD</td>
<td>USD</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Country of origin:**
Piston

**Commodity code:**
84129080

**Total Value:**
USD 1.0

**Value for Customs Purposes Only:**
USD 1.0

**VAT 0% supply outside EU:**

---

Tuomas Mäenpää
### Appendix 4: Packing List (Sample)

#### PACKING LIST

<table>
<thead>
<tr>
<th>Packing Plan:</th>
<th>Package Number:</th>
<th>LBU Project:</th>
<th>Packer:</th>
<th>Company:</th>
</tr>
</thead>
<tbody>
<tr>
<td>123456</td>
<td>1</td>
<td>ABC</td>
<td>Mäenpää, Tuomas</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date &amp; Time:</th>
<th>Net Weight (kg):</th>
<th>Gross Weight (kg):</th>
<th>Sales Order No:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov 15, 2011</td>
<td>3.2</td>
<td>4</td>
<td>987654</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions (cm):</th>
<th>Type of Package:</th>
<th>Notes:</th>
<th>Terms of Delivery:</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 x 30 x 20</td>
<td>Box, Carton</td>
<td></td>
<td>FCA Jyväskylä Incoterms 2010</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Volume (m³):</th>
<th>IU: Inside unheated</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.024</td>
<td></td>
</tr>
</tbody>
</table>

**CUSTOMER/delivery address:**

**Marks and Numbers:**

- Contact: Matti Meikäläinen
- Customer PO No: 123/456789
- Shipping Area: Jyväskylä

**Name of the Package:**

**Notes:**

- By Air Freight / TNT

**Consignor:**

<table>
<thead>
<tr>
<th>Parent Item</th>
<th>Parent Item Description</th>
<th>Parent Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITM1234567</td>
<td>PISTON</td>
<td>1 PCE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drawing</th>
<th>Quantity</th>
<th>Unit</th>
<th>PCS-Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

---
Appendix 5: CCC Certification (Sample)
Appendix 6: CCC Mark (Sample)
Appendix 7: IPPC Mark (Sample)

- IPPC Symbol
- “DE” stands for country code of Germany
- “NW” identifies more specified regional code, North Rhine-Westphalia
- Unique registration number starting with 49.
- Treatment method, HT (heat treatment), MB (methyl bromide), if applicable, DB (debarked)
Appendix 8: Non-wood certificate (Sample)

CERTIFICATE OF NON WOOD PACKING MATERIAL

We hereby certify that below mentioned package (4.0 kg) is of non-wood packing material.

Package references:
-123456
-123/450789

Tuomas Mäenpää

November 19, 2011
Appendix 9: ATA Carnet (Sample)
### Appendix 10: Bill Of Lading (Sample)

**BILL OF LADING – SHORT FORM – NOT NEGOTIABLE**

<table>
<thead>
<tr>
<th>Date</th>
<th>BILL OF LADING – SHORT FORM – NOT NEGOTIABLE</th>
<th>Page 1 of 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BILL OF LADING – SHORT FORM – NOT NEGOTIABLE</td>
<td></td>
</tr>
</tbody>
</table>

**SHIP FROM**

<table>
<thead>
<tr>
<th>Name</th>
<th>[Street Address]</th>
<th>City, ST ZIP Code</th>
<th>SID No.:</th>
</tr>
</thead>
</table>

**Bill of Lading Number:**

**BAR CODE SPACE**

**SHIP TO**

<table>
<thead>
<tr>
<th>Name</th>
<th>[Street Address]</th>
<th>City, ST ZIP Code</th>
<th>CID No.:</th>
</tr>
</thead>
</table>

**Carrier Name:**

**Bar Code Space**

**THIRD PARTY FREIGHT CHARGES BILL TO**

<table>
<thead>
<tr>
<th>Name</th>
<th>[Street Address]</th>
<th>City, ST ZIP Code</th>
<th>CID No.:</th>
</tr>
</thead>
</table>

**Special Instructions:**

- Freight Charge Terms (Freight charges are prepaid unless marked otherwise): Prepaid ❑ Collect ❑ 3rd Party ❑
- Master Bill of Lading with attached underlying bills of lading.

**CUSTOMER ORDER INFORMATION**

<table>
<thead>
<tr>
<th>Customer Order No.</th>
<th># of Packages</th>
<th>Weight</th>
<th>Pallet/Slip (circle one)</th>
<th>Additional Shipper Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y N</td>
</tr>
</tbody>
</table>

**Grand Total**

<table>
<thead>
<tr>
<th>Handling Unit</th>
<th>Package</th>
<th>LTL Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty</td>
<td>Type</td>
<td>Qty</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CARRIER INFORMATION**

| COD Amount: $ | Fee Terms: Collect ❑ Prepaid ❑ Customer check acceptable ❑ |

Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the commodity as follows: The agreed or declared value of the property is specifically stated by the shipper to be $ [ ].

**Note:** Liability limitations for loss or damage in this shipment may be applicable. See 49 USC § 11706(c)(1)(A) and (B).

**Shipper Signature/Date**

This is to certify that the above named materials are properly classified, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the DOT.

**Trailer Loaded:**

- By shipper
- By driver

**Freight Counted:**

- By driver/pallets said to contain
- By driver/pieces

**Carrier Signature/Pickup Date**

Carrier certifies that the COD amount stated is acceptable and that the COD package was received by the carrier at the time of COD signature and that all COD documentation is complete. Property described above is received in good order, except as noted.
Appendix 11: Waybill (Sample)

### Waybill

<table>
<thead>
<tr>
<th>Shipment Reference</th>
<th>Account No.</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consignee Name and Address</th>
<th>Consignee account Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shipping Agent Name and City</th>
<th>Accounting Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agent OFA Code</th>
<th>Approval No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount of Consignment</th>
<th>Originated and requested Routing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To</th>
<th>By</th>
<th>By</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Handling Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of Pieces</th>
<th>Gross Weight</th>
<th>Tare Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Gross Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Charge</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature of Shipper or Agent</th>
<th>For British Airways or Carrier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Shipper certifies that the particulars on the face hereof are correct and that no part of the consignment contains dangerous goods, such part is properly described by name and in proper condition for carriage by air according to the applicable Dangerous Goods Regulations.

---

### ORIGINAL 2 (FOR SHIPPER)
Appendix 12: Products subject to China Compulsory Certificate

1. **ECW - Electrical Wires and Cables** (5 categories)
   - Cord Sets
   - Flexible rubber-sheathed cords for mining purposes
   - Insulated cables (wires) for railway vehicles of rated voltage up to and including 3kV
   - Rubber insulated cables of rated voltages up to and including 450/750V
   - Polyvinyl chloride (PVC) insulated cables of rated voltages up to and including 450/750V

2. **SCIPCD - Switches for Circuits, Installation Protective and Connection Devices** (6 categories)
   - Appliance couplers (household and similar purposes, industrial purpose)
   - Plugs and socket outlets (household and similar purposes, industrial purpose)
   - Thermal-links
   - Cartridge fuse-links and thermal fuse
   - Switches fixed electrical installations for household and similar purposes
   - Enclosures for accessories fixed electrical installations for household and similar purposes

3. **LVEA - Low-voltage Electrical Apparatus** (9 categories)
   - Residual current protective devices
   - Circuit-breakers (including RCCB, RCBO, MCB)
   - Fuses
   - Low-voltage fusers (disconnectors, switch-disconnectors, and fuse-combination units)
   - Other protective equipment for circuits (current limiting devices, circuits protective devices, over current protective devices, thermal protectors, over load relays, low-voltage electromechanical contactors and motor starters)
   - Relays (voltage above 36V, up to and including 1000V)
   - Other switches (switches for appliances, vacuum switches, pressure switches, proximity switches, foot switches, thermal sensitive switches, hydraulic switches, push-button switches, Position limit switches, Micro-gap switches, two direction switches, temperature sensitive switches, travel switches, change–over switches, auto-change-over switches, knife switches)
   - Other devices (contactors, motor starters, indicator lights, auxiliary contact assemblies, master controllers, A.C. Semiconductor motor controllers and starters)
   - Low-voltage switchgear and gear assemblies

4. **SPM - Small Power Motors** (1 category)
• Small power motors

5. **ET - Electrical Tools** (16 categories)
   • Drills (include impact drills)
   • Screwdrivers and impact wrenches
   • Electric grinders
   • Sander
   • Circular saws
   • Electric hammers (electric pickax)
   • Spray guns for non-flammable liquid
   • Electric scissors (electric scissors for double-edged blades, electric impact scissors)
   • Electric tapping machine
   • Reciprocating saws (jig saw and sabre saws)
   • Internal Concrete vibrators
   • Electric chain saws
   • Electric planer
   • Electric hedge trimmer and Electric grass shears
   • Electric stone cutters (including Marble cutters)

6. **WM - Welding Machines** (15 categories)
   • Portable A.C. arc welding machines
   • A.C. Arc welding machines
   • D.C. Arc welding machines
   • TIG welding machines
   • MIG/MAG welding machines
   • Submerged arc welding machines
   • Plasma arc cutting machines
   • Plasma arc welding machines
   • Electric shock protective devices for arc welding transformer
   • Coupling devices for welding cables
   • Resistance welding machines
   • Fire feeder for welder
   • TIG welding blow lamp
   • MIG/MAG welding torches
   • Electrode holders

7. **HSUA - Household and Similar Use Appliances** (18 categories)
   • Refrigerators and food freezers (with the effective volume under 500L, household and similar use with/without frozen compartment, frozen food storage cabinet, freezer and their combination)
   • Electric fans (with single-phase alternate current and direct current for household and similar use)
   • Air-conditioners (the refrigeration shall not be exceed 21000 cal/h for household and similar use)
   • Household washing machines (with/without the devices of water heating, spinning extraction and drying)
   • Storage water heaters (including fixed storage water heaters and instantaneous water heater, heating water to a temperature below its boiling point)
• Room heaters (radiant heaters, panel heaters, liquid-filled radiators, fan heaters, convector heaters, tubular heaters for household and similar purposes)
• Vacuum cleaners (vacuum cleaners having the functions of suction dust or liquid, driven by either series or D.C. motors)
• Electric irons (electric dry irons and steam irons for household and similar purpose)
• Electromagnetic cookers (electromagnetic heating kitchen appliance which may contain electromagnetic heating components single hob or hobs for household or similar purpose)
• Roasters (including rated volume not over 10L roasters, toasters, waffle irons, and similar appliances for household or similar purpose)
• Electric food processors (household food preparation machines and similar multiple-use food preparation machines)
• Microwave ovens (household appliances for heating food and beverages using electromagnetic energy in one or more of the I.S.M. frequency bands OVER 300 MHz. These appliances may also incorporate a browning or steaming functions)
• Cooking ranges, hobs, ovens and similar appliances (including household cooking ranges, stationary electric ovens, hobs, stationary cooking ranges, hobs, grills and griddles, induction ovens and grills)
• Range hoods (electric range hoods installing above household cooking ranges, hobs and similar cooking appliances, with fans, lights and controllers)
• Appliances for heating liquids and water dispensers
• Electric rice cookers (automatic heat-preservation or timer electric rice cooker with heating components)

8. **AVA- Audio and Video Apparatus** (excluding the acoustics apparatus for broadcasting service and automobiles) (15 categories)
• Active loudspeaker system having single or multiple speaker with the max output sound power under 500W (R.M.S.)
• Audio power amplifier
• Tuners
• Radio receivers
• Recorders, players, dealers for audio and video with kinds of carrier, media (including kinds of carrier of cassette tape and laser disc)
• Power adapters for audio/video products
• Color television receivers with all kinds of display types
• Display monitors (not including television receivers for automobiles)
• B/W television receivers and other monochrome television receivers
• Picture/display tubes
• Video recorders
• Satellite television receivers
• Electronic organs
• Antenna amplifiers
• Equipment and components for cable distribution systems of sound and television signals

9. **ITE - Information Technology Equipment** (12 categories)
   - Personal computers
   - Portable personal computers
   - Display units connected with computer
   - Printers connected with computer
   - Multiplying printer & coping machines
   - Scanners
   - Switching power supply units for computer and adapters, chargers
   - Computer game equipment
   - Educating appliances
   - Duplicators
   - Servers
   - Finance and trade settlement equipment

10. **LA - Lighting Apparatus** (excluding the lighting apparatus with voltage lower than 36V) (2 categories)
    - Luminaries
    - Ballasts

11. **TTE - Telecommunication Terminal Equipment**
    - Cordless telephone terminal (Analogue Cordless telephone set, Digital Cordless telephone set)
    - Key-phone system (Key-phone system, Telephone Conference Exchange)
    - Fax machine, Voice/Fax Card and Fax machine with multi-functions
    - Modem (Voice-band Modem, Base-band Modem, DSL Modem, including card)
    - Mobile Terminal (Analogue Mobile Station, GSM Digital Cell Mobile Station (including handset and other terminal), CDMA Digital Cell Mobile Station (including handset and other terminal))
    - ISND Terminal (NT1, NT1+ TA (including card))
    - Data Terminal (Storing/Transmitting Fax/Voice card, POS terminal, Interface Transformer, Network Hub, Other Data Terminal)
    - Multimedia Terminal (Video Phone, Conference System, VOD Terminal, Other Multimedia Terminal)

12. **MVSP - Motor Vehicles** (2 categories)
    - Automobiles
• Motorcycles

13. MVT - Motor Vehicle Tires (3 categories)
• Passenger car tires (Passenger car radial ply tire, Passenger car diagonal tire.)
• Truck tires (Ultra light Truck tires, Light Truck tires, Medium/heavy Truck tires)
• Motorcycle Tires (Code indicating series, Metric system series, Light type series, Scooter series)

14. SG - Safety Glasses
• Safety Glass for Road Vehicle (Laminated Glass A, Laminated Glass B, Zone-Tempered Glass and Tempered Glass)
• Safety Glass for Building (Laminated Glass, Tempered Glass)
• Safety Glass for Railway Rolling Stock (Laminated Glass, tempered Glass, Insulated Safety Glass)

15. AM - Agricultural Machinery (1 category)
• Equipment for Crop Protection (Motorized or Manual Liquid Knapsack sprayer, Motorized or Manual Powder Knapsack sprayer, Motorized Liquid and Powder Knapsack sprayer)

16. LP - Latex Products (1 category)
• Rubber Condoms

17. MD - Medical Devices (7 categories)
• Medical Diagnostic X-Ray Equipment
• Hemodialysis Equipment
• Hollow Fiber Dialyzers
• Extra-corpooreal Blood Circuit for Blood Purification Equipment
• Electrocardiographs
• Implantable Cardiac Pacemakers
• Artificial Heart-Lung Machine

18. FFF - Fire Fighting Products (3 categories)
• Fire Alarm Equipment (Point Type Smoke Fire Detectors, Heat Sensitive Point Fire Detectors, Fire Alarm control Units, Control for Fire Protection Equipment, Manual Fire Alarm Button)
• Fire Hose: Lined Fire Hose, Wet Fire Hose
• Sprinkler Extinguishment Equipment (Sprinkler, Wet System Alarm Valves, Water Flow Indicator, Fire Pressure Switch)

19. DIAS - Detectors for Intruder Alarm Systems (1 category)
• Detectors for Intruder Alarm Systems (Microwave Doppler detectors for use in building, Active infrared intrusion detectors, Passive infra-red detectors for use in building, Combination microwave and passive infrared intrusion detector)

(CCC-Mark.com 2009a)