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MARKET ANALYSIS OF DEMKO FIELD OPERATIONS

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Executive Summary

Based on the data collected in the survey, DEMKO should continue to develop and expand its Field Operations Department. The market appears to be especially fertile in both the household and IT companies. To develop the existing field operations market to its full potential, DEMKO must ensure that the target clientele are properly educated about any potential field services that DEMKO can provide. Additionally, it is imperative that DEMKO makes use of its relation with Underwriters Laboratories to fulfill the large need for on-site testing according to North American standards.

The information for this analysis was gathered through a survey directed at a selection of DEMKO clients and potential future clients. Spatial and temporal constraints required the conduction of the survey by phone. Companies were questioned on areas of interest and testing needs to determine the size and characteristics of the potential market.

The survey results provided a very positive view of the potential for future field operations initiatives from DEMKO. The demand for on-site testing is high within all investigated industries with 61% of household companies and 44% of IT companies were interested or very interested in on-site testing. More importantly for DEMKO, the willingness to use DEMKO is high among companies interested in on-site testing. Ninety-four percent of clients and thirty-five percent of non-clients indicated an interest in using DEMKO for on-site service.

The largest obstacle to overcome in accessing this market is educating customers that the service exists and that DEMKO can provide it in a timely and cost efficient manner. A surprisingly large percentage of companies (25% of clients) had never heard of on-site testing. Forty-four percent of these companies were interested in on-site service with DEMKO after learning it was available.

The need for UL certification makes the market especially promising for DEMKO. Sixty percent of companies interested in on-site testing were in need of UL certification. In the majority of these cases, this UL certification is needed in addition to European testing schemes. This is a market area that DEMKO has the qualifications and abilities to fulfill.

The outlook for DEMKO's Field operations is positive. All aspects of the survey and analysis indicate a vast market that is larger than previously conceived.[62] Properly managed and implemented, there should be vast growth in the Field Operations Department in the future.

Acknowledgments

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1.0 Introduction

It is of paramount importance, that businesses in every field understand the market in which they operate. For businesses to survive and prosper, it is necessary to understand the needs of the customers and to satisfy those needs. In order to create a focus on its client's needs, close attention must be paid toward understanding the customer's problems and determining the best course of action to minimize these concerns.[1]

DEMKO and its parent company Underwriter's Laboratories are leaders in safety testing and certification of electrical and hazardous products. DEMKO's testing and certification capability includes Nordic, European, North American and International product safety standards for a wide array of consumer and industrial products. In the safety testing and certification field it is crucial that clients can rely on DEMKO for prompt, high quality, reliable service.

Current operational procedures allow for timely, quality service by testing products at DEMKO's facilities in Herlev, Denmark. Naturally, there are time considerations involved with shipping the product and examining it in a different location than it is produced in. It is possible however, that bringing testing to the client can reduce time and thus improve the service to the customer. Such a service, generally referred to as known as field operations, could potential provide a great benefit to both DEMKO and its clients.[1]

DEMKO does have a field operations department. The department is responsible for coordinating testing and certification of client's products at the client's facilities. At DEMKO, Field Operations is responsible for only 5% of total testing revenue. Compared to Underwriters Laboratories, which generates 30% of testing revenue from field operations, this is a limited sector of DEMKO's current service market.[2] Expansion of this department

could mean improving the satisfaction of existing clients as well as attracting new clients that are interested in the additional service of on-site testing.

In order to consider the expansion of the field operations department, DEMKO must first reach an understanding of the needs and priorities of its clients and potential clients. Providing a service that is not needed by the consumer does not serve DEMKO or the client. In examining the needs of it clients, DEMKO can deliver better service to a targeted clientele that needs the potential services.

It is the goal of this project to determine the future expansion possibilities and develop marketing strategies for the field operations department at DEMKO. Determining the future expansion will be achieved by conducting a survey and using the results of the survey to make a recommendation of what possibilities exists for DEMKO's Field Operations Department. The coordination of the marketing and the field operations department along with the survey results will be needed in order to evaluate market strategies for the future of field operations at DEMKO.

2.0 Background

2.1 History of DEMKO

Based on the need for safety in consumer products DEMKO conducts third party product safety testing as the National Certifying Body (NCB) for Denmark. In accordance with its mission, "*DEMKO is committed to meet the clients needs for trade facilitation while providing the services for the product to obtain market acceptance.*" DEMKO was founded in 1928, under the Copenhagen Lighting Authority, because of a growing concern over the safety of electrical goods at the time[3]. The intent was to provide unbiased third party testing of electrical products to ensure their safety for consumer use.

In 1964, DEMKO was nationalized and DEMKO's safety testing became mandatory for electric goods sold in Denmark. The testing requirement was replaced with agreements to a European system of registration starting in 1978, resulting from Denmark's entrance to the European Union six years earlier in 1972. Through the years, DEMKO has continued to provide a high standard for safety testing in Denmark[3].

DEMKO became a private company on July 15, 1996 when it was acquired by the US based Underwriters Laboratories (UL). Since then, DEMKO has become the subsidiary of UL and has continued its high standards of safety testing, long recognized throughout Europe[3]. DEMKO's connection with UL has provided it a dual role as a certification agency. It's current capabilities allow for certification of products for European markets as well as those products that are to be exported to the United States and North America where UL standards apply.

2.2 History of Underwriters Laboratories

Founded in 1894, Underwriters Laboratories has long dedicated itself to safety testing, standardization, and quality assurance in wide range of products, industries and countries. Expanded greatly beyond its beginnings, the non profit organization now employs

over 4,000 personnel with more the 1.5 million square feet of laboratory space[4]. Its base of operation consists of the United States as well as international subsidiaries and service locations located in Mexico, Japan, Hong Kong, Korea, Singapore, Taiwan, Malaysia, India, Denmark, England, Italy, Sweden, Canada, China, Thailand, France, Germany, and the Netherlands. Beyond this, UL posses an equally vast network of affiliate testing agencies globally[5].

The first "UL" report was made at the request of the Chicago Fire Department after the much-famed "Palace of Electricity" required much of their attention and the Chicago World's Fair. William Merrill was brought in as an expert to evaluate the safety of the devices on display at the fair. His report was the beginning of long and dedicated service to the safety testing of products, and the foundation of Underwriters Laboratories.[6]

The range of products serviced by UL is very diverse. While testing began in the field of electrical consumer products, this is no longer the exclusive case. Today, UL investigates and tests a wide range of products including alarm technologies, bulletproof glass, refrigerants, as well as more traditional testing of electronics and other electric items.[7] This market is continually expanding with more than 14 million products entering the marketplace with UL markings.[4]

The UL mark itself has become nearly second nature to the American consumer. It represents that a given product has been tested by UL's rigorous standards to comply with all pertinent safety regulations and guidelines set forth by the government or developed by UL itself. Such recognition of quality, ability and standards represents the cornerstone of the UL family's dedication to the cause of safety testing.[7]

2.3 CB Certification Scheme (CB)

With the continual expansion of the global market place it becomes more important all the time to have unified standards that cross national boundaries. The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) provide a forum for the creation and monitoring of international certification standards. All products within the electrotechnical industries are standardized by the IEC, currently comprised of 57 member nations. All other products are covered by standards set forth by the ISO.[8]

Together, the IEC and ISO work to create and maintain standards that all member nations are agreeable to and will agree to comply with. In doing so, some of the barriers otherwise in place are broken down as testing agencies worldwide will know the standards that other testing agencies meet. This allows for easier transition of a product between different global markets.[9]

The IEC certification scheme for electrical products, known as the Committee on Certification Bodies (CB), represents the broadest certification scheme. Its standards are agreed on by 44 signatories in 34 countries around the world. Member nations include Australia, Austria, Belgium, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Republic of Korea, Netherlands, Norway, Poland, Russia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Ukraine, United Kingdom, United States, Yugoslavia. Each member signatory meets on various committees relating to their areas of expertise. Together with other agencies they set the standards by which all CB nations will comply.[10]

Manufacturers from all over the world can apply to any National Certifying Body (NCB) for certification whether or not their country is represented in CB. Manufacturers applying from non-CB countries however must pay an additional fee to the CB secretariat.

In either case the manufacturer and the NCB will then work in testing the product to ensure compliance with CB certification standards appropriate for the industry and product.[10]

2.4 CENELEC Certification Agreement (CCA)

Within Europe, another certification group known as the European Committee for Electrotechnical Standardization (CENELEC) operates. Its standards, known as the CENELEC Certification Agreement (CCA), provide standards specific for European certification. The agreement focuses primarily on reciprocal recognition of testing between the 18 member countries (Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom). Products tested at one CENELEC testing facility will qualify for the mark of any other CENELEC country.[10]

The reciprocal agreement stipulates that the primary testing agency will represent the manufacturer in receiving additional testing marks. Often data collected by the primary testing agency will be transferred to the second testing agency and be granted certification based on the original test results. According to the provisions in the CCA, reciprocal arrangements are only open to manufacturers located within one of the member countries of CENELEC.[10]

In order to avoid overlapping, or possible contradictory standards, CENELEC works closely with IEC to ensure consistent standards are set. CENELEC will accept all standards set forth by IEC. Agreements and standards set by CENELEC are thus those effecting the European community and not the international community. In order to assure that new CENELEC items will not interfere with IEC business any new CENLEC directive is developed jointly with IEC. After a short period IEC will make a decision if the agreement will be made on the International level or stay as a European agreement. Any standards of

international importance or influence will be developed and implemented by IEC. Those not developed by the IEC are left to the European level and developed by CENELEC.[11]

2.5 Nordic Certification Service (NCS)

The Nordic certification authorities (DEMKO, NEMKO, SEMKO, and FIMKO) have another certification agreement known and the Nordic Certification Service (NCS). The NCS is a similar agreement to that on the CENELEC in that it is a reciprocal testing agreement. The difference with NCS is that testing is more easily accepted between Nordic certifiers. If for instance DEMKO certifies a product it can be assumed to meet FIMKO, SEMKO, and NEMKO standards as well. For the manufacturer this means a quicker turn around time for multiple Nordic certifications.[10]

In the past, NCS was open only to those manufacturers located in one of the Nordic countries supporting the NCS. This is no longer the case as now any manufacturer may receive the services of the NCS by using any one of the four Nordic certifying bodies. This provides manufacturers with greater flexibility when marketing products within multiple Nordic countries.[10]

2.6 Overview of European Certifications Offered by DEMKO

Certification of products with the European market represents the core market of DEMKO's client and certification market. While the recent partnership with Underwriters Laboratories has added to the importance of testing outside of Europe, testing to European standards remains the largest section of DEMKO's business. DEMKO's location and past experience with European standards makes DEMKO the natural hub for UL European markets in addition to the market already connected.

Whatever the certification needs of a company there is a process by which companies can pursue certification from DEMKO. The first step is to determine all standards that will be applicable to the end product. At this stage the company will need to have a good idea of the market they intend to place a product in to consider what national, regional, or international standards apply. It is also important to consider upcoming standards that may come into effect within the lifetime of the product. Because of the complex issues and vastness of national and international regulations many companies find that consultation with DEMKO is crucial through this process. DEMKO has the knowledge and background to provide for the company.[12]

With many products it is possible for DEMKO to test partial products before the completed product is completed. By testing partial products less time will be spent on fixing problems then if a tests were conducted only on the final product. This reduces the time and resources that a company spends on product development and safety testing. Such partial testing is encouraged by DEMKO as part of product development within the company. If DEMKO tests partial products, it is usually unnecessary for DEMKO to retest those portions of the final product.[12]

When the completed product is finished, DEMKO will conduct the electrical safety tests necessary to ensure compliance with standards. At this stage, it is necessary for companies to sit down with DEMKO and make final decisions on what areas to test the product for. Third decision will be influenced by the nature of the product and the countries for which certification are desired. At this time companies will work with DEMKO in deciding the number of products to be tested to ensure the most accurate of test sample of products.[12]

Once all decisions are made regarding the testing procedures, the company will submit an official application to receive certification. The application includes information

on the product as well as the countries of intended certification. From this application DEMKO will complete a testing timetable that will be used to determine the charges associated with the testing process.[12]

Upon receipt of the product samples, DEMKO will begin testing and investigations of the product. If at any time throughout the process problems or discrepancies are found the company will be made aware to allow correction of nay errors. This may continue for multiple repetitions as the product is redesigned and re-tested until DEMKO is satisfied from testing data that the product meets all testing standards agreed upon in advance.[12]
When all tests are satisfactorily completed, the results will be transferred to another section of DEMKO for further review of the testing process, and to assure there were no testing errors that could effect the outcome. After assuring the accuracy of testing the certification will be drawn up for the product outlining what testing was completed and the standards that it is compliant with. At this stage, DEMKO can also send test reports to affiliated testing agencies in other nations to receive certification for those nations.[12]

2.6.1 The D-Mark

The primary mark for DEMKO is the D-Mark (figure 2.1). The D-Mark has long represented the high standards of certification set by DEMKO. Behind the mark is a guarantee that the product has been tested and certified by DEMKO to conform to all applicable safety standards. In Denmark the D-Mark has long been the standard for safety in consumer electrical products. While the mark itself is no longer mandatory, many companies choose to pursue certification to reassure consumers and to obtain the CE Marking that is mandated by law.[3]

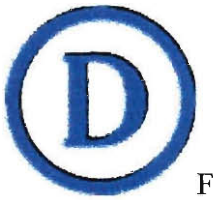


Figure 2.1: The D-Mark

2.6.2 CE Marking

Any manufacturer wishing to market or sell electrical products with the European Union is required to comply with various regulations dependent on the product type. To demonstrate compliance with all pertinent regulations products are granted the CE Mark (figure 2.2). The CE Mark differs in meaning from the D-Mark in that it is not a safety or quality mark. The consumer is granted no guarantee or safety assurance from a CE. Instead the CE mark signifies that a given product meets all European regulations related to that product type. For instance, obtaining of the CE marking for a product may include factory testing to ensure that the facilities are within regulations. Because of this, the CE Mark is more a mark for the authorities than the average consumer.[3]

Figure 2.2: The CE Mark

Due to the large number of regulations that any company or product can be required to follow, it can become extremely difficult for the average company to stay current on all applicable standards. In order to aid their customers, DEMKO provides consultation services in relation to CE standards and regulations. Experts in the field can provide clients with current information on important regulations in order to ensure compliance with CE standards.[3]

2.6.3 European EMC Testing

Electromagnetic Capability (EMC) has become an increasing concern as electronic products become more sophisticated and prevalent. When a product fails to properly comply with EMC standards interference can be caused between two electronic products. The two important measures of EMC compatibility relate to the amount of electromagnetic radiation given off and the reaction when receiving electromagnetic radiation from an outside source. Minimization of broadcasted electromagnetic radiation is desirable because of the interference that can be created when left unchecked. Likewise, a product will ideally not malfunction when exposed to external electromagnetic radiation. The European EMC Mark (Figure 2.3) represents compatibility with European standards for electromagnetic radiation and tolerance.[13]

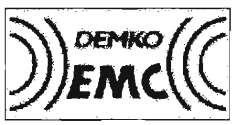


Figure 2.3: European EMC Mark

2.6.4 European Norms Electrical Certification (ENEC)

The "European Norms Electrical Certification" is a special certification provided within Europe for products relating to the luminaries industry. Previous to 1996, the "LUM" agreement regulated the luminary industry in matters of consumer safety and production standards. Its goal was to unify standards within Europe in the area of luminaries and create a single standard to replace the multitude of national standards and marks.[15]

In 1996, the ENEC mark was created to mark those luminaries complying with this European standard.[15] By 1997, the agreement was expanded to encompass other areas of certification such as IT equipment, transistors, and other equipment relating to the luminaries industry. Manufacturers wishing to receive the ENEC mark must comply with applicable

safety standards set for by the ENEC certifying agencies, and submit to an annual inspection of production facilities.[16]

The mark itself is a single identifiable mark for all European nations. All participating nations, which are loosely parallel to those in the CCA, agree to accept the ENEC mark as they previously did their own national marks. In order to differentiate the certifying body, a number is place next to the ENEC mark that is distinct for each certifying agency. The number 15 represent DEMKO.[17]

Figure 2.4: European Norms Electrical Certification

2.6.5 HAR Agreement

Within the CENELEC nations, the cable and wire industry has an agreement specifying standards for the industry. These standards, known as harmonized standards or as the HAR agreement, dictate that complying manufacturers must seek inspection from a certifying agency four times a year. Compliance and certification grants that the marked wire complies with wire and cable safety standards set forth by the CENELEC nations. The mark itself is either marked externally or integrated as a mark-wire in the cable or wire.[18]

2.6.6 Nordic Certification System

In accordance with the provisions of the NCS agreement DEMKO is capable of authorizing the marks for its associate Nordic certifiers through consultation with those agencies. Used in similar applications as the D-Mark the marks of NEMKO (figure 2.5), FIMKO (figure 2.6), and SEMKO (figure 2.7) can be added to products at the desire of the

manufacturer. Provision for this can be completed through coordination with the appropriate organizations in accordance with the Nordic Certification System.[19]

Figure 2.5: NEMKO Mark

Figure 2.6: FIMKO Mark

Figure 2.7: SEMKO Mark

2.6.7 The GS-Mark

For manufacturers wishing to receive certification to German standards, DEMKO is able to provide the German GS-Mark (figure 2.8) in cooperation with German certifier Landesgewerbeanstalt (LGA). The GS mark is similar to that of the D-mark, in its recognition as a symbol of product safety within Germany. DEMKO is able to pursue certification to GS standards on behalf of the manufacturer by following similar guidelines and application process as for a D-mark[20]

Figure 2.8: The GS-Mark

2.6.8 Keymark

The next major European certification is the Keymark (figure 2.9). The Keymark represents standards agreed upon within the member nations of CCA. Like other European marks, the goal of the Keymark is to create a unified safety mark for all of Europe. While it may seem initially similar to the CE Mark, the Keymark is aimed not at national authorities

and their requirement but rather the end consumer. The goal of the Keymark is to create a mark that the safety conscious consumer can recognize and look for throughout Europe.[21]

Because of similarities with the ENEC mark CCA regulations require that the two certification systems take measures to ensure they do not overlap. Currently the ENEC mark is limited to luminaries and their associated components while the Keymark is applied to products outside of the luminary industry. Qualification for the Keymark is based on similar concepts as other certification schemes such as upon testing that focuses on factory inspections; random sample supervision and testing performed by testing institutes. Because the Keymark represents a single mark granted by multiple certifying agencies, the same numbering system used for ENEC marks in used in the Keymark, whereby a number (15 for DEMKO) is used to represent the certifying agency.[22]

Figure 2.9: Keymark for DEMKO

2.6.9 EX Mark

Potentially explosive areas require that a product receive special testing to ensure product safety in these often-dangerous environments. While no formal agreement scheme exists a set of harmonized standards within the European Union allow certification and granting the Ex Mark. The mark ensures compliance with all applicable standards depending on the particular environment in which the equipment will be used.[23]

Depending upon the circumstances DEMKO will either grant a certificate of conformity or a DEMKO certificate for the item. The certificate of conformity is issued for those products that comply 100% with the harmonized standards set forth. Certification is

based on the classification zone (0, 1 or 2) in which the manufacturer determines where the end product will be used. The DEMKO certificate will be issued in place of the certificate of conformity for those items marketed exclusively within Denmark, and meeting criteria specific to the product. These items will be marked the Ex Mark with the addition of an s to signify the special protection area.[23]

In July of 2003, the ATEX Directive will come into effect. This directive will become the new European standard for equipment used within explosive environments. Many manufacturers find it desirable to ensure conformity to this new standard before it comes into effect. DEMKO is able to provide this service on the basis of similar criteria to the current Ex harmonized standards.[23]

2.7 Overview of North American (UL) Certificates

Many of the certifications offered by DEMKO are those applicable to the European market. Similar to the variety of certifications within the European market, the North American and specifically the United States offer a variety of different certifications specific to the regional area. DEMKO's unique position as a UL subsidiary gives DEMKO the ability to certify certain products for export to the United States and North America according to UL standards.

Pursuit of UL certifications through DEMKO follows the same lines as certification according to European standards. During the early planning stages DEMKO will work with the manufacturer to determine which UL certificates may be necessary to comply with North American regulations and directives. At this time DEMKO can begin testing along UL guidelines along with European standards if necessary.

2.7.1 UL Listing Mark

The most common of the UL marks is the UL Listing Mark (figure 2.10). The UL Listing Mark represents that samples of the product have passed UL's safety requirements. It is similar in many respects to the D-Mark in Denmark as the national mark of safety and consumer protection. Perhaps more than any other mark the UL Listing Mark represents safety to the American consumer when purchasing a wide variety of products including appliances, fire extinguishers, computers, televisions and other electronic equipment.[7]

Figure 2.10: UL Listing Mark

2.7.2 UL Classification Mark

In some fields, a general UL listing mark is not appropriate. Some products such as fire doors and some protective clothing must undergo more rigorous testing based on their intended usage. These products typically earn the UL Classification Mark (see figure 2). This mark certifies that the product is suitable for a given environment. Based on the marking and testing it can be trusted within its normal operational location.[7]

Figure 2.11: UL Classification Mark

2.7.3 UL Recognized Component Mark

Another mark provided by UL is rarely seen by a product's end user. This is the component recognition mark. This recognizes that a given component is safe by itself. Its

recognition by UL does not necessarily indicate that the component will operate safely as part of a larger system. To guarantee the larger system's safety a UL listing mark must be earned by the overall product.[7]

It is important to note that recognition of individual components does not necessarily indicate that the end product is certified or that when assembled in a larger product will meet safety requirements. The UL listing mark accomplishes end product certification. Component testing is important because it guarantees to industry that given components such as wire, plastics, boards, pumps, and heaters will not cause safety problems. This allows concentration on the rest of the design rather than worrying about testing each subsystem along the way.[7]

Figure 2.12: UL Recognized Component Mark

2.7.4 International EMC Mark

For products in which EMC or electromagnetic compatibility is an issue, UL grants the International "EMC-Mark" (figure 4). Similar in nature to the corresponding DEMKO mark, the International EMC Mark ensures that marked products will meet EMC standards of radiation and acceptance of the United States, Japan, Australia, Europe, or a combination there of, for all electrical products.[7]

Figure 2.13: International "emc-Mark"

2.7.5 Food Service Product Certification Mark

Products used in the food preparation industry must obtain yet another UL mark. Because of the nature of what these products will be used for it has been decided necessary to regulate their design. The Food Service Product Certification Mark (figure 14) certifies that the product in question has met the standards necessary for food preparation such as sanitation and other concerns specific to the food service industry. Products such as gas appliances and other non-powered equipment are eligible to receive this mark.[7]

Figure 2.14: Food Service Product Certification Mark

2.7.6 Field Evaluated Product Mark

In some cases, equipment may require on site modifications that can effect their original safety qualification. In this event it is often infeasible or impossible to remove the equipment for testing at a UL facility. In this case the Field Evaluated Product Mark is used. Like other UL marks, the Field Evaluated Product Mark represents a product that has met UL's high standards but has been evaluated in the field after extensive modifications to its original form.[7]

Figure 2.15: Field Evaluated Product Mark

2.7.7 Facility Registration Mark

The last of the UL marks does not certify a product but a facility. The Facility Registration Mark indicates a facility certified by UL to meet quality assurance guidelines set forth in ISO 9000, QS 9000, and ISO 14001. These guidelines ensure compliance with quality principles along a variety of guidelines set forth.[7]

Figure 2.16: Facility Registration Mark

2.7.8 Canadian Certification

Canadian certification requirements are set forth by the Standards Council of Canada (SCC). The SCC has authorized UL and by association its subsidiaries the power to grant certification marks for the Canadian Market. Many of the same certifications used in the American market will be used in conjunction with the Canadian Market. The primary difference in the marks is the C that is added to create the C-UL Listing Mark (figure 2.17), C-UL Classification Mark (figure 2.18) and the Canadian Recognized Component Mark (figure 2.19). It is also possible to receive a joint listing for both Canadian and UL standards by use of the C-UL US Listing Mark (figure 2.20).[7]

Figure 2.17: C-UL Listing Mark

Figure 2.18: C-UL Classification Mark

Figure 2.19: Canadian Recognized Component Mark

Figure 2.20: C-UL US Listing Mark

2.8 Supervised Management Testing (SMT)

In the age of larger multinational companies, it becomes more common within the certification community that manufacturers will possess testing equipment and personnel that is on par or even exceeds that of a NCB in certain areas. Due to this ever-present reality it is recognized by NCBs that an alternative system of certification must be made available to these companies with the means to test their own products. With the CENELEC countries an agreement was reach in August 1985, and later revised in April 1988, September 1988, and April 1991, regarding situations requiring special provisions for manufacturer completed testing.[24]

The CENELEC agreement outlined what it referred to as Supervised Manufacturer's Testing (SMT). The premise of SMT is based on the model of a company that has extensive testing apparatus and are able to perform all tests necessary for certification at its own facilities with its own personnel. The manufacturer's benefit lies in the removal of the need to submit each new product for approval by the NCB. By completing testing within the manufacturer's facilities, the total design and certification time can be reduced, thus bringing the product to market quicker.[25]

In order to enter into a SMT agreement with a NCB it is typically necessary for the manufacturer and NCB to have some level of established relations. The greater the previous connection, the easier it will be to receive SMT certification ability, because it is first necessary for the NCB to be assured of the capabilities of the equipment and personnel and the manufacturer's location.[14] The NCB must be guaranteed that all test equipment is available and properly calibrated. By a similar nature the manufacturer's testing coordinators

must be supervised by NCB officials to ensure knowledge of standards and competence with testing equipment.[24]

After preliminary assessments are made, and the resources and abilities of the manufacturer are established, an SMT agreement may be entered. In accordance with CENELEC agreements, the NCB will at this time communicate the existence of an SMT agreement to the CCA Chairman for inclusion in a register of SMT approved companies and supporting NCBs. The register will provide crucial information to other certification authorities and interested bodies demonstrating the ability of the manufacturer to comply with SMT standards. Likewise, contracts that are removed are reported to ensure that a manufacturer can not continue to use a certification that has been removed.[25]

After acceptance under the auspices of the SMT agreement the manufacturer must naturally continue to imply with all standards in the same manner as they would with any other certification. For the duration of a valid SMT, the results of the manufacturer will remain on equal footing with any other certification agreement approved by the NCB. In order to ensure compliance with the appropriate applications of the SMT agreement, it is mandated by CCA provisions regarding SMT that the NCB will randomly inspect the manufacturer's premises to ensure compliance.[24]

The SMT agreement can provide manufacturers with the ability to perform tests for certification while reducing design time through local on-site testing. These provisions can be brought forth within any of the CENELEC nations but are not applicable to the creation of products outside of the CENELEC signing nations. Copies of CENELEC agreements pertaining to SMT agreements can be found in Appendixes A, B, and C.

2.9 Testing at Manufacturer's Premises (TMP)

The provisions and potential benefits of on-site testing are not only open to those with a full spectrum of testing equipment. In accordance with CENELEC agreements, similar to the SMT provisions, there exists a system of certification known as Testing and Manufacturer's Premises (TMP). The key difference between the instrumentation of an SMT and TMP agreement is the degree of involvement by the NCB.[14]

Within the SMT agreement, the manufacturer completes the majority of the hands-on testing. The TMP agreement allows for the manufacturer with limited or non-existent testing equipment to be visited by the NCB for partial or complete testing of products in similar manner to SMT. Within a TMP agreement, however, it is no longer the responsibility of the manufacturer to provide testing equipment and knowledgeable staff. In its place the NCB is responsible for traveling to the manufacturer's premises and provide testing personnel and possibly equipment to test the products seeking certification.[14]

2.10 DEMKO's Clients

Like many companies, DEMKO has a grouping of companies from which most of its business is drawn. In the case of DEMKO, 80% of its testing revenue originates from 20% of its customers. Due to the market percentage these companies represent their views and habits can be used as an indication of DEMKO's customer's as a group. To understand the needs and priorities of its customer's an analysis of its key accounts was conducted in 1998.[26]

While many of DEMKO's clients are happy with DEMKO's services and abilities they do not for the most part use DEMKO exclusively. The wide selection of European certification bodies no doubt contributes to the 84% of key accounts that indicate they use testing laboratories other than DEMKO.[26] This demonstrates the great need DEMKO has for

understanding and satisfying the needs of its clients. It also shows that there exists a potentially large market within DEMKO's current customers if DEMKO can provide services that they go to other agencies for.

The existence of future clients within previous clients is certainly evident based on the 89% of past clients that indicated they will either definitely or probably use DEMKO again. By meeting the needs of these clients it can be expected that they will continue to use DEMKO into the future. While there is a high rate of potential repeat business, the remaining 11% of companies represented 900,000 DKr (approximately $130,000)[27] worth of business.[26] By creating a higher level of satisfaction a greater number of these clients can become repeat customers.

For DEMKO's clients, the two of the most important factors in the certification process are "Keeping agreements and time limits" and "The turnaround time". This demonstrates a need on behalf of the customer to have predictable timely service. The quicker clients can receive certification the faster they are able to market their products. Likewise clients would like to make plans based on time schedules. When certification delays arise, later stages of development and marketing are delayed as well.

These areas of "Keeping agreements and time limits" and "The turnaround time" also achieved the largest gap between expectations and satisfaction scores. This indicates that in these crucial areas DEMKO is not fully living up to the needs and expectations of the customers. In order to current this gap it is necessary to determine ways in which these areas can be improved.

Other important considerations include "Service", "Relations to DEMKO employees", "Technical skills", "Price", and "Feedback." Aside from relations with DEMKO employees, these areas also had gaps between expectations and satisfaction, that

while not as big as "turnaround time" and "Keeping agreements and time limits", were still note worth as possible areas of difficult and future expansion.[26]

2.11 Field Operations at DEMKO

At DEMKO the Field Operations Department is responsible for facilitating testing of products outside of the Herlev facilities. As a developing department, Field Operations currently makes use of other internal testing groups to test products at the manufacturers location. Currently, the department is expanding to include an engineering staff to enable future self-sufficiency.[2]

The services offered by the department are based upon the CCA provisions for SMT and TMP testing. Based upon the relationship with a manufacturer DEMKO can establish an agreement in accordance with CCA agreements concerning SMT and TMP testing.

The perceived need for an expanded Field Operations is based upon the analysis of DEMKO's key accounts. Ideally, Field Operations can reduce turn around time by testing and certifying products on-site.[2] In doing so, shipping times are eliminated and communication time between DEMKO and client is reduced. By reducing these elements the turnaround should be reduced. Likewise, the improvement in communication can help to keep the testing process on schedule. If these can be accomplished the satisfaction of clients should be increased in these areas.

2.12 Field Operations at UL

While Underwriters Laboratories is not a member of CCA, and thus is not included within the provisions for SMT and TMP testing procedures, it maintains a large Field

Operations Department. UL's Field Operation's programs are based on CB guidelines and a system of testing that is very similar to the CCA programs. Like DEMKO, UL uses its field operations department to conduct testing at the location of its clients.

The Client Test Data Program (CTDP) relies on UL's clients to produce testing results for products the wish to certify. The UL CTDP is similar to the SMT program of DEMKO and CCA. The primary difference between the programs is the markets they service and the annual inspection requirement. UL inspection criteria for the CTDP program requires the random inspection of production facilities and testing procedures on a quarterly basis.[14]

Underwriters also has a program that parallels the CCA's TMP procedures. The Witnessed Test Data Program (WTDP) allows for testing at a manufacturer's facilities. UL engineer's travel to the manufacturer's facilities to test products in the same manner as stipulated with CCA agreements in regards to TMP.[14]

2.13 Field Operations at Competing Companies

Various competitors provide services similar to those offered by DEMKO and UL in the area of Field Operations. For European competitors these programs fall under CCA agreements relating to SMT and TMP service agreements just as they do at DEMKO. For worldwide competitors the standards are based on CB scheme guidelines similar to the UL standards. It is unclear precisely which companies currently operate SMT or TMP programs and to what extend they are implemented. Kema and NEMKO are known to have SMT and TMP programs.[28,29] It is suspected that all signing members of the CCA provisions for SMT have some level of program in this area, but it is not known at this time to what extent these programs are conducted.

2.14 Market Research

Market research is "The systematic and objective identification, collection, analysis, and dissemination of information for the purpose of assisting management in decision making related to the identification and solution of problems in marketing."[30] Market research consists of six different steps: defining the problem, developing an approach to the problem, formulating a research design, collecting data, analyzing data, and making a conclusion.[31]

2.14.1 Problem Definition

The first step of a market research is defining the problem. By properly defining the problem, project goals are established which set the tone for the rest of the project. In the problem definition process, there are a series of procedure that should be followed. Finding sufficient background information, considering resources restraints, knowing the objectives of the company and the individual making decision, and predicting buyer's behavior should be accomplished prior to problem definition.[32]

Background is any information that may concern the problem. For market research, relevant background would consist of information about the past and future patterns of sales, market share, technology, and profitability. By examining past and possible future trends, potential opportunities and problems may arise.[32]

Consideration of time and money should be determined after relevant background is examined. Market research project that consumes too much time, money, or personnel will negate any benefits accomplished by the market research. It is important to discuss with the individual responsible for making the decision to determine how many resources are available for the market research.[33]

Knowing the objectives of the company and the individual making the decision are the next step in the problem definition process. Such objectives can be improving client to company relations, maintaining a quality image, improving advertising techniques, or introducing a new product line to increase sales. By satisfying the objectives of the company and the decision-maker, the market research project will successful.[34]

The next step of the problem definition process is to predict the buyer's behavior. The buyer influences increases in sales and net-worth of a company. Predicting buyer's behaviors allow problems to be identified easily.[35]

The final step in the problem definition process is the definition of the market research problem. When defining the problem, it should not be defined too narrowly or too broadly. By defining the problem too broadly, a clear-cut decision on how to solve the problem can not be decided. Defining a problem too narrowly results in possible innovative and not obvious solutions being overlooked.[36]

2.14.2 Developing an Approach to the Problem

After defining the problem, possible ways of solving the problem must be drawn. This step is needed to create a general outline for solving the problem. "An incorrect approach to a problem will, at best, lead to wasted results, or at worst, it may lead to wrong decisions."[37]

The two methods of developing an approach to the problem are looking at case studies and performing simulations. Case study is an in-depth investigation that is related to the marketing research problem. These investigations are based on a small number of cases that involve people, organizations, or situations. Case studies help identify any variables that

effect the market research, give insight about the relations between these variables, and clarify the root of the problem.[38]

The second method is to perform a simulation. This simulation involves a series of steps for developing and manipulating a problem similar to that of the market research so that possible solutions can be processed. The key to this method is to develop a problem similar to the current one. After the similar problem or representation of the problem is developed, variables associated with the representation can be used so results can be investigated.[39]

2.14.3 Formulating a Research Design

Research design is "the framework or blueprint for conducting the market research."[40] This step involves developing methods for obtaining information from the respondents. There are two key methods for obtaining information from respondents, observation and survey.

Observation method involves the recording of the people and object's behavior. The observer is responsible for recording the behavior. The test subjects are the people or object that are being observed. The observer does not interfere with the test subject's behavior by asking questioning or communicating with them. The environment in which the test subject's behavior is monitored can be either a natural or artificial environment. A natural environment is an environment that takes place where the test subject's behavior would most likely occur. An environment that the observer creates for the test subject is called an artificial environment.[41]

Survey or questionnaire methods involve an interviewer and a respondent. The interviewer asks a series of questions to the respondent and he answers the questions. The responses are collected for use in the analysis.

The survey method involves the questioning of respondent. In order to minimize unwillingness of respondent, confusion of respondent and ambiguity to answer questions a design process is needed. This process consists of eight steps: (1) selection of information, (2) interviewing method, (3) question content, (4) overcoming inability and unwillingness of respondent, (5) question structure, (6) question wording, (7) question order, and (8) pretesting.[42]

2.14.3.1 Selection of Information

The first step of the survey design process is to find what information is needed to complete the market research. Time and resources will be wasted if the survey asks questions that do not lead to a proper conclusion. In order to save time, it is necessary to consider what information is needed to base a useful recommendation that could be useful. Respondent's time is valuable, questions must be limited to those that are crucial and relevant.

2.14.3.2 Interviewing Method

The second step of the survey design is how to administer the survey. Surveys can be conducted in four major ways, telephone, personal, mail, and computer.[43] How a survey is administered will influence the time, cost, and information gathered. The survey method will also affect the phrasing of questions.

There are two ways, in which telephone surveys are conducted, traditional and computer assisted. In both methods, the respondents are asked a series of question through the use of a phone. Since the telephone interviews involve the interaction of the interviewer

and respondent, the survey must be phrased so that the interviewer is trying to carry out a conversation. The difference between the two methods is the way that the information is stored. Traditional telephone interviews force the interviewer to write down all the response on paper while the computer assisted interviews allows the interviewer to put the responses directly into the computer.[44]

Surveys conducted when the interviewer and the respondent are present at the same location are called personal interview. Personal interviews also involve the interaction of interviewer and respondent, the survey needs to be phrase so that the interviewer is carrying out a conversation. The three forms of personal interviews include in-home, mall-intercept, and computer-assisted. Personal in-home interviews require the interviewer to contact the respondent, go to their location, and administer the survey. The mall intercept personal interviews require the interviewer to stop shoppers at a local shopping mall and ask if they would like to participate in a survey. Computer assisted personal interviews require the respondent to use a computer to fill out a survey electronically. This is considered a form of personal interviews because the interviewer is present if the respondent has any questions.[45]

Mail surveys are conducted when the market researcher writes down the questions and sends the questionnaire via mail. There are two different types of mail surveys, ordinary and mail panel. Both types require the respondent to write down the answer on the questionnaire and send it back to the market researcher. The key difference between the two is that mail panel has a target audience provided before data collection while ordinary mail surveys, a target audience has to be identified.[45] When distributing the mail survey, it is important to know that there is no contact between the respondent and the interviewer so the question must be clear and precise.[46]

The last method is becoming more widely with increased availability of computers. Computer surveys are conducted via e-mail or internet. E-mail surveys are conducted similar

to mail, except the market researcher sends the survey electronically over a network. The internet surveys are conducted when the respondent goes to a specific website and is then requested to fill out a questionnaire. Since the method of communication between the interviewer and the respondent is so different, decision must be based several factors.

Speed, response rate, cost, and quantity of data received from the respondent are factors that influenced the decision making process on how the survey should be conducted. The response rate is the ratio of the information received from the client versus total number of surveys attempted.[47] For example, if twenty survey were conducted and ten responses were received then the response rate would be fifty percent.

Speed is the amount of time it takes for the respondent to answer the questionnaire and refers to the total amount of time required to collect data for analysis. Quantity of data is the amount of data received from the respondent. The number of questions asked can easily influence quantity of data. Cost is the amount of money to produce the survey and distribute the survey.

2.14.3.3 Question Content

The third step of the survey design is determining content of each question. Determining if the question is needed should be considered when determining the content of every question. By eliminating questions that are not needed, space and time are saved. Multiple questions maybe needed to get a specific desired information.[48]

2.14.3.4 Overcoming Inability and Unwillingness of Respondent

The fourth step of the survey design is overcoming the unwillingness of the respondent to answer questions and the inability of the respondent to answer questions.

Reasons that respondent are unable to answer questions are they are not informed, can not remember, or can not articulate on the subject.

A way of solving a respondent's inability to answer question is to inform the respondent about the market research being conducted. Even when respondents are not familiar with the subject matter, they often still express an opinion.[49] Because of this reason, the "don't know" option should be used to filter out responses that may cause problems with the analysis. In cases where the respondent does not remember or can not articulate about the subject matter, it is easier to give the respondent a set of answers to choose from.[49]

Even when the respondent can answer questions relating to the subject, they may be unwilling to disclose information because it requires too much energy, the question has no legitimate purpose, or the information requested is too sensitive. To overcome these obstacles, it is important to put sensitive material towards the end of survey because the respondent trust and confidence are increased after a series of questions are asked. In cases where too much energy is required from the respondent to answer the question, have predetermined list of choices for the respondent to choose from.[50] By giving the respondent a set of answers, the respondent can answer the question much easier. A respondent may feel a question serves no purpose, but by explaining why this information is desired, the respondent will be more willing to give an answer.

2.14.3.5 Question Structure

The fifth step of the survey design is determining how the question should be structured. This step involves what kind of format the question should follow. There are four ways of structuring a question: no structure, multiple choice, dichotomous, and scaled.

A question that has no structure are considered free response questions.[51] This type of question allow the respondent to express their opinion. Multiple choice questions give a list

of answers from the respondent to choose from. They can then either choose one or more answers depending on how the question is worded. Dichotomous questions limit the respondent to either yes or no answers. Scaled questions require the respondent to choose from a range of answers between two extremities.

2.14.3.6 Question Wording

The sixth step of the survey design is determining the wording of the questions. Questions must be worded so that the desired information can be received from the respondents. If the questions are phrased correctly then the respondent will know what answers to give. If a question is phrased incorrectly the respondent may give a response that is totally unexpected. Unexpected answers will make it harder to analyze the data. In order to ensure usable answer it is necessary to avoid leading questions, keep the vocabulary simple, avoid ambiguous words, and avoid assumptions.[52]

Keeping the vocabulary simple allows the respondent to understand the question. Technical words should be avoided because they may irritate the respondent and their willingness to answer more questions will decrease.[53] Questions that lead the respondent to choose a specific answer are called leading questions.[54] Formulating questions that help the respondent to certain answers creates biased answers. Information gained from leading questions is useless because it does not accurately reflect the target audience's opinion.

Ambiguous words are words that have no clear meaning. Words such as several, often, and frequently are ambiguous words because they do not have a clear-cut meaning. Two different respondents will have different interpretations of ambiguous words. In order to avoid confusion ambiguous words needs to be avoided. Asking questions that assume the

respondent knows certain details puts the respondent in an uncomfortable situtation.[55] To avoid assumptions, questions must fully explain themselves.

2.14.3.7 Question Order

The seventh step of the survey design is determining how the questions should be arranged. The way that the survey is organized influences on how the respondent answers each question. When organizing the survey, there are some rules that should be observed. Such rules that are important in organizing the survey is having an appropriate question in the beginning, a logical order of the questions, and an introduction explaining purpose of survey.[56]

By opening the survey with the correct question, the interviewer will gain the cooperation and the confidence of the respondent.[56] By starting the survey with a question that is simple and interesting, the respondent will gain confidence and more likely to continue the survey.

An informed respondent is more willing to answer questions because they may feel that their opinion can make a difference. For this reason an introduction is helpful to inform the respondent about the survey that they may take part in. The introduction should also include some background information that may relate to the survey. By having some background, it will clarify any questions that may be asked if it did not exist.

The order of the questions that are asked must be in some logical order. This is so respondents do not feel like they are being asked questions that have no relation from one another. When switching from one subject to another, it is important to use a transitional question.

2.14.3.8 Pretesting

The final step of the survey design process is practicing the survey on small group of respondents with a process known as pretesting. By distributing the survey to a small group of respondents, the survey can be tested for possible problems in wording, flow or understanding. The group of respondents in the pretesting phase should be representative of the actual population in order to ensure that pretesting will accurately reflect the conditions of the real survey. When possible, participants in the pretest should be contacted in person, no matter how the actual survey is to be distributed. By conducting the pretest in person greater feedback can be gained. It may be necessary to conduct the pretesting phase multiple times in order to correct all problems with the survey.[57]

2.14.4 Data Collection

The fourth step of the market research is the collection of data. During this phase, contact with the respondents are established, surveys and observation forms are distributed to observers or interviewers, data is recorded and stored. In this step, investigating methods on minimizing errors should be examined.[58]

There are many types of error: researcher, respondent, nonresponse, and interviewer error. Researcher errors are errors involving the observation and survey forms. Researcher error should be minimized if sufficient pretesting was done prior to distribution of surveys and observation forms. Respondent errors occurs when they are not able to answer the question, or they are unwilling to disclose any information. Non-response errors are errors that result in the respondent's refusal to answer any questions or the respondent's unavailability.[59]

The last type of error, interviewer error results when the interviewer words the question wrong or records the data incorrectly.[59] When a question is worded incorrectly, the respondent may respond differently or the desired information may not be obtained. Recording errors will occur but the goal is to minimize them because it leads to inconsistent results or biased results. Errors are detrimental to the final analysis because the results are inaccurate, and the responses are not based on what information was desired.

2.14.5 Data Analysis

Analyzing data is the fifth step of the market research. This step involves the compiling, editing and analyzing of the data collected from the previous section.[60] Compiling data can be performed by gathering all of the observational forms or response sheets of the surveys. If a computer was used during the collection process, compilation is already accomplished.

Editing the data involves sorting of all the different forms used to collect data, verifying of all data, and making any corrections to the forms. Sorting the data allows for an easy way to locate any particular result for future reference. Verification of data is making sure the data is accurately recorded. Corrections to forms may be necessary if the forms were not recorded accurately.[60]

Analysis of the data tries to "give meaning to the data that has been collected".[61] Analysis of data involves through examination of the data. By examining the results, possible solutions to the problem that was defined at the beginning of the market research are theorized.

2.14.6 Solution Presentation

The final step of the market research is to present a solution to management about the problem that was defined at the beginning. In this step, the solutions that were theorized in analysis are examined. The solution or solutions to the problem are weighed based on economic, technological, and organizational limitations. A solution that costs too much is to far technologically advanced, or takes up too many personnel will solve the problem. A proper solution must successfully answer the market research problem within given limitations.

3.0 Methodology

3.1 Survey Preparation

Properly conducted and coordinated market research will give a proper indication of the needs and demands for field operations. A survey or questionnaire provides the best means for gathering data from the market. A questionnaire fits the needs of DEMKO's situation because it allows DEMKO to gather information directly from its current and potential clientele. When the information is gathered from the survey, a properly informed decision can be made regarding the future expansion of DEMKO's Field Operations Department.

3.1.1 Selection of Desired Information

Deciding on information that is desired for analysis should be accomplished first. This information must be able to address the issues that relate to the development of DEMKO's Field Operation Department. Selection of the proper information was done through brainstorming and discussion with the Marketing and Field Operations Department at DEMKO. Information that was pertinent for the final analysis was collected and approved.

The list of the desired information is presented below:

- Availability of safety testing equipment
- Other certifying bodies that company has used
- Benefits of on-site service
- Interest of company in on-site service
- Decision on using DEMKO for on-site service
- Cost of service
- Type of products that need to be certified
- Number of products safety tested annually
- Certification type that is needed for their products concerning on-site service
- Importance of turn around time
- Importance of cost

- Countries that company exports to
- Company name
- Individual name
- Position of individual
- Phone number
- E-mail address
- Company web page
- Type of industry the company is involved in
- Number of employees
- Location of company
- Current client status
- Company's willingness to pay extra

The desired information was broken down into three parts: basic, classification, and identification information. Basic information consists of information that would directly affect the demand for field operations. Classification information is information about companies to help classify companies into different categories. Identification information is information that identifies the respondent and allows for future correspondence.

3.1.1.1 Basic Information

The following is a list of basic information needed to perform analysis concerning the development of DEMKO's Field Operations Department :

- Interest of company in on-site service
- Decision on using DEMKO for on-site service
- Benefits of on-site service
- Availability of safety testing equipment
- Cost of service
- Company's willingness to pay extra
- Certification type that is needed for their products concerning on-site service

Since the DEMKO is trying to expand its Field Operations Department, it is necessary to find out if companies are interested in on-site testing. This information is needed to find out if there is a demand for field operations. Another important piece of information was the company's decision on whether to use DEMKO concerning on-site

service. This information would explain if companies would use this new service if DEMKO provided it. This information would explain if a sufficient demand is for field operations by DEMKO is present.

Knowing the companies benefit of on-site service will be used to help market the new on-site service. The availability of safety testing equipment will help determine if companies are more able to support SMT or TMP type agreements. Knowing the company's willingness to pay extra will help determine the price level of the new service. DEMKO offers many certification schemes, it is valuable to know what type of certification scheme is needed for the company's products. This helps find which certification is in high or low demand for on-site service.

3.1.1.2 Classification Information

The following is a list of classification information:

- Type of industry the company is involved in
- Type of products that need to be certified
- Importance of turn around time
- Importance of cost
- Other certifying bodies that company has used
- Number of products safety tested annually
- Number of employees
- Location of company
- Current client status

Information about what type of products companies sell or what industries they are involved in is desired to determine the interest level of different industries. The importance of both cost and turn around time, time it takes to get certification, are important for a comparison to the data collected within the "Key Account Analysis" concerning cost and turn around time. The "Key Account Analysis" also evaluated how many DEMKO clients used other certifying bodies. Knowing what companies used other certifying bodies will help

DEMKO determine who their competitors are and ensure they can offer their clientele better service.

The number of products that the company safety tests annually will help DEMKO realize how often DEMKO's service may be needed. Knowing the number of people employed at a company determines the size of the company. This information helps to find the correlation between the size of the company versus interest in field operations. The location of the company is needed to determine the regions that are interested in on-site service. The client status is needed to differentiate if clients or non-clients are interested in field operations.

3.1.1.3 Identification Information

The following is a list of identification information:

- Countries that company export to
- Company name
- Respondent's name
- Position of respondent
- Phone number
- E-mail address
- Company webpage

Company name, position of respondent, phone number, and e-mail address are important information because this information allows future contact with the company. Information concerning what countries companies export to will help determine where companies distribute their products. The information about the company's webpage will help find more information about companies.

3.1.2 Selection of Interviewing Method

The largest limiting factor in determining the survey method in this study is time. Because the survey must be completed and analyzed in less then 2 months use of mail surveys is not a reliable option. As evidence, a previous survey conducted by DEMKO of its key accounts was distributed by mail. In two months, 60% of the mailed surveys had been returned.[26] It can be expected that a survey sent to the same audience would receive a similar response rate. This response time is unacceptable for the limitations of this project. Personal interviews are not feasible for the needs of this survey. The target audience is widely dispersed throughout Europe. Travel time and cost make this survey type unacceptable for DEMKO's purposes.

The most practical survey option for DEMKO's purposes is the telephone survey. Telephone surveys provide the quickest results for a large audience that is spread out geographically as is the case with DEMKO's clientele.

3.1.3 Question Creation

Question creation was broken down into three sections based on content. The three sections are basic, classification, and identification. When formulating these questions, phrasing and structuring of each question were evaluated to get a desired response from the respondent.

3.1.3.1 Question Creation of Basic Information

"*On a scale from 1 to 5, 1 being very uninterested and 5 being very interested, how interested is your company in on-site service*?" Structuring the question to get a scaled

response was chosen because the interest level of the company for field operations was desired. The first portion of the question was needed to explain the scale to the respondent.

"*Would your company consider using DEMKO in relation to on-site service*?" The structure of this question forced the respondent to choose from either yes, no, or don't know about the company's decision to use DEMKO concerning field operations. A question asking why the company would or would not use DEMKO concerning field operations is needed. If a sufficient amount of the responses to the first question are affirmative, this information will help DEMKO plan a marketing strategy for the new service. Knowing the reasons why companies would or would not use DEMKO would helps in determining the reasons a company will choose to use or not to use DEMKO.

When formulating the question for requesting the availability of safety equipment, it was necessary to use two questions instead of one. Two questions were needed to find this piece of information to differentiate companies who performed safety tests to companies who did not perform safety tests. *"Does your company perform its own safety testing for your products*?" This question is structured to get a response of yes, no or don't know. The question screens companies for the availability of equipment at their location. If equipment is available then the following question was then asked "*On a scale from 1 to 5, 1 being very limited and 5 being able to perform all tests necessary for certification, how much lab equipment is available at your company for on-site certification of all your products*?" This scaled question requests the amount of equipment that is available at companies for certification of their products.

The question that resulted in the benefits of on-site service was split into two different questions. Instead of starting with an open-ended question, a dichotomous question was used. "*Would your company benefit if your products were certified on-site*?" If the answer

was yes then the following question was then asked: "*Would you please indicate how it would benefit*?" The information was split up into two questions to filter out those companies that did not see a benefit to on-site testing. If the first question were phrased as an open-ended question, the company would have felt the need to give a benefit even though they felt that there was none.

"*On-site service means quicker certification. In terms of percentage, how much more would your company be willing to pay for on-site service*?" An open-ended question is desired so that a numerical value can be used to get information about the company's willingness to spend more. Responses are limited by asking respondents to answer in terms of a percentage.

3.1.3.2 Question Creation of Classification Information

"*What type of products does your company currently have tested*?" The desired result of this question are the type of products, companies have safety tested at the present time. A follow up to this question is "*What type of products would your company consider testing on-site in the future*?" This is an open-ended question, that provides information regarding the kind of products the companies may prefer testing on-site.

"*In relation to on-site service would your company need to certify your products according to International, European, or UL (North American) standards*?" The question is structured as a multiple choice because there are many certification types. The testing procedures between the certification scheme are different. The three choices of International, European and UL were decided because it was the main division between the schemes.

"*On the scale from 1 to 5, 1 being very unimportant and 5 being very important, how important is the turn around time*?" "*On the scale from 1 to 5, 1 being very unimportant and*

5 being very important, how important is cost?" These questions ascertain the companies' importance of turn around time and cost. Both questions are structured as scaled questions. The first part of both questions was needed to clarify the scale.

"*Does your company use third party testing*?" The response to the question provides information about the number of companies that use other certifying bodies. This question is structured as a dichotomous question to differentiate companies that have used other certifying bodies to companies that have not. If the response to the previous question is affirmative then a question that collected the names of other certifying bodies is asked.

Since the analysis needed to go into more in-depth evaluation of field operations, the information about other certifying bodies was broken down. Knowing information about other certifying bodies that may perform on-site service helps DEMKO by informing what competitors are in the market currently. To acquire this information, two questions were used. The first one was: "*Has your company used on-site services before*?" If the response was yes then the following questions were asked: "*What company helped you with the on-site service*?" "*What products were certified on-site*?" These questions find out what type of products companies are using to perform on-site testing and find out what other certifying companies are offering on-site services. If the response to the first question was no then the following question is then asked: "*Would you please indicate why not*?" This is to find out why the company has not used on-site service before.

3.1.3.3 Question Creation of Identification Information

Formulating identification information was relatively easy. The phrasing of the question will not greatly influence the response because this information is non-variant. All the questions were structured as open-ended questions because the responses are unique to

each company. Questions were worded politely because the information requested is rather personal.

3.1.4 Designing the Flow of the Survey

Before asking any questions, it is important to greet the respondent and make sure the individual answering the question can give the information desired. The introduction took the following:

> *Good (morning / afternoon / evening),*
> *I'm calling on behalf of DEMKO, the Danish subsidiary of Underwriters Laboratory. Could I please speak with _____ ? (name provided through listings / product safety manger / product approval manager / describe person that you are looking for)*
>
> *<Wait until transferred>*
>
> *Good (morning / afternoon / evening), my name is _____. I am an American University student working with DEMKO, the Danish subsidiary of Underwriters Laboratory. This project is concerned with the future expansion of its field operations department.*
>
> *Would it be possible to ask you some questions, it will take approximately 10 minutes?*
>
> *No - When would be a better time to call you back?*
> *Thank You!*

The first part is a greeting that asks the potential respondent, if they are the individual responsible for making sure their company's products are properly safety tested. The next part determines the respondent availability to answer questions. If the person is too busy to take the survey, then a time is determined when they can be contacted to complete the survey. If the respondent is willing to answer questions then the following introduction was used to inform the respondent of the survey that they were participating in:

> *Field operation is the testing and certification of your products outside of DEMKO's testing facilities for North America and European markets. Such testing*

and certification of your products can be completed at your location. By testing and certifying your product at your location, DEMKO can shorten the turn around time. DEMKO's on-site service includes either testing of products at your site by DEMKO engineers or coordinating with your company to use your testing results to obtain certification.

The introduction briefly explains what field operation entails. Explaining the key difference between normal testing and field operation is crucial to inform companies that the testing is done at their facilities rather than DEMKO's. There are two types of field operations in which DEMKO offers. The explanation of two types of field operations is necessary to familiarize the companies with what services DEMKO can provide.

After informing the respondent, the opening question is then asked. "*Question one, does your company perform its own safety testing for your products*?" This was the first question because it was a simple. If the respondent answered yes then the following question was asked, "*On a scale from 1 to 5, 1 being very limited and 5 being able to perform all tests necessary for certification, how much lab equipment is available at your company for on-site certification of all your products*?"

The second question is "*Does your company use third party testing*?" If the respondent replies yes to the previous question, then this question is asked, *"Would you please indicate with whom*?" Both questions are simple and answer what companies the respondents may have done business within the past or the present.

Questions concerning benefits of on-site certification, interest of company in on-site service, decision on using DEMKO for on-site service, and company's willingness to pay extra were put early in the survey because those questions were key information that was essential for analysis. Placing them later in the survey would have allowed the answers to become biased by other questions. The questions are organized so that the survey starts out with the respondent's general perspective of field operations and gets more specific about

field operations as more questions are asked. Questions three through six were organized as such:

3. Would your company benefit if your products were certified on-site?
Yes – Would you please indicate how it would benefit?

4. On a scale from 1 to 5, 1 being very uninterested and 5 being very interested, how interested is your company in on-site service.

5. Would your company consider using DEMKO in relation to on-site service?
Yes - Would you please indicate why?
No - Would you please indicate why not?

6. On-site service means quicker certification. In terms of percentage, how much more would your company be willing to pay for on-site service?

The next set of questions contained questions about the type of products a company needs to be safety certified, type of products that companies wanted on-site certification, number of products safety tested annually, and type of certification needed for company's products. These questions were organized to transition from interest in on-site service to what type of products that a company would use if on-site service were offered. Questions seven through twelve were organized as such:

7. Has your company used on-site services before?
Yes - What products were certified on-site?
What company helped you with the on-site service?
No - Would you please indicate why not?

8. What type of products does your company currently have tested?

9. What type of products would your company consider testing on-site in the future?

10. During the next two years, approximately how many products would you believe that your company would have safety tested?

11. How many of those products would your company consider using for on-site testing?

12. In relation to on-site service would your company need to certify your products according to International, European or UL standards?

Questions concerning importance of turn around time and cost were at the end because these questions were of less importance. Also these question were placed at the end so that they would not bias other questions. The results of both questions would be used to compare the results of the "Key Account Analysis." Questions thirteen and fourteen were organized as such:

13. On the scale from 1 to 5, 1 being very unimportant and 5 being very important, how important is the turn around time?

14. On the scale from 1 to 5, 1 being very unimportant and 5 being very important, how important is cost?

The last set of questions was for identifying what companies were called, and information about the company. Only information that was not known was asked because some of the identification information was established prior to calling. Before ending the survey, companies were thanked for their participation. The end of the survey was organized as such:

15. What countries does your company export to?

To better understand our clients/your company I would like to find out some more information about your company.

What is the name of your company?
What is your name?
What is your position?
What is your direct phone number?
What is your e-mail address?
What is your company's web page?
What type of industry is your company involved in?
How many people are employed at your company?
What country are you located in?

Thank you very much for your time.

3.1.5 Internal Review and Testing

Before getting the survey approved, management of the marketing department needed to review the survey. Since the marketing department is very knowledgeable about market research, they reviewed the survey. Final approval by the marketing department is needed because the survey reflects DEMKO's professional image.

The survey needed to be tested prior to distribution. For this reason, internal testing was used. If testing is not accomplished, current clients and non-clients may be dissuaded from doing future business because the survey does not represent DEMKO's professional image. With the help of John Jacobsen, list of DEMKO engineers was contacted and they were asked to pretend as potential respondents. The following engineers were contacted: Jens Christian Jensen, Carsten Hagelund, Benny Christiansen, Jørn Brinkmann, and Jakob Nittegaard. Their input was valuable and prompted changes with wording and structuring of questions to aid understanding and retrieval of desired responses.

3.1.6 Database Creation

When conducting surveys it is important to develop an effective method of storing data. Using effective organization skills during the data collection process eases the analysis process. A database software program called Microsoft Access was use to collect data from the different companies.

In the database, shown as a screenshot figure in 3.1, the database fields were organized so that it was possible to enter information easily while conducting a phone interview. The layout of the database was similar to that of the paper survey. The identification information was on top for quick reference of the company, telephone number, company's industry and the respondent's name. The survey questions were put on the

database so that the interviewer did not read from a separate sheet of paper. This allowed the interviewer to focus all of his attention on the screen instead of going back and forth between the paper copy of the survey and the computer screen. Lastly the database was put onto the network so that multiple users could access and input information into the database.

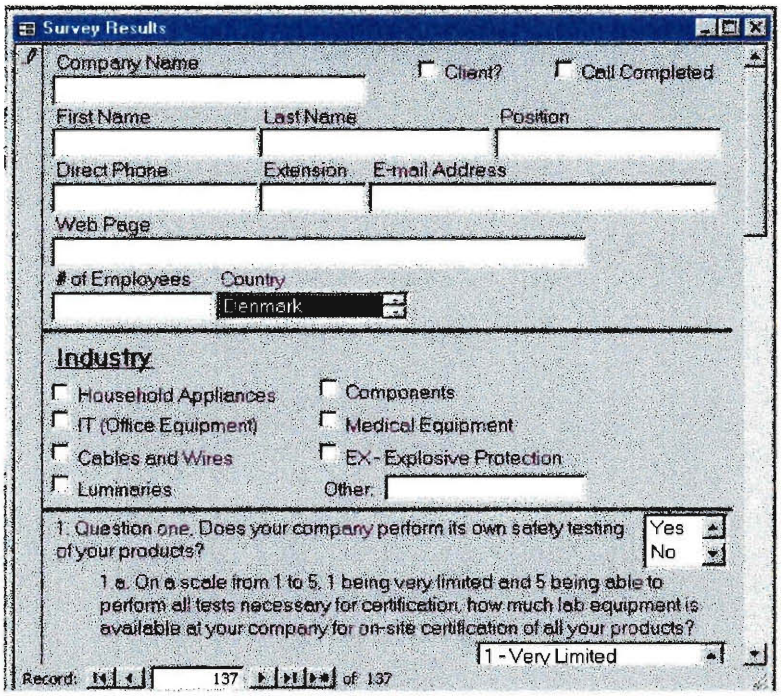


Figure 3.1: Database Screenshot

3.2 Establishing Contacts

After the survey was approved, tested, and a database was created, a contact list needed to be established. The contact list was divided into two parts: non-clients and clients. John Jacobsen created a preliminary list of both non-clients and clients.

John Jacobsen established the client listing based on information from DEMKO's client database. Clients targeted for the survey were some of the less active, non-key account companies. The reasoning for this decision was that many of the key accounts already used some type of on-site testing or were otherwise well situated such that administration of the survey would not provide useful results. It was necessary to filter out companies that already

held SMT or TMP agreement with DEMKO because the interest of the survey was to study potential markets, not existing ones.

Other considerations used when choosing the clients to call included the current status of relations with the company. Companies who were not currently favorable to DEMKO were excluded to avoid possible further repercussions. Additionally, companies who were currently undergoing negotiations for testing were avoided to prevent any misunderstandings or potential difficulties.

In establishing the list of non-clients to be called the largest factors of consideration were to ensure that the companies being called were production facilities for products that could be tested and certified by DEMKO. Initially, this listing was based on a list of companies presented by DEMKO of potential future clients. After contacting these companies, a business CD called Direct 1999 was used to obtain information on companies within the target industries.

3.3 Calling Contacts

After establishing who to call, the survey needs to be administered. The survey was distributed in Europe where not all respondents speak English fluently. Because of this it was crucial that emphasis was placed on speaking slowly and clearly. When calling clients a contact individual was usually known. Conversely, when calling non-clients it was often necessary to deal with reception desks to determine the correct individual to speak with. In the majority of cases it was easiest to explain the responsibilities of the individual who needed to be contacted. Specifically this meant referring to the individual who was responsible for making sure that a companies' products were properly tested and certified.

3.4 Examination of Results

Survey data is not useful in the raw form in which it is collected. The power of survey results exists in the significance of the collective responses and as an indicator of trends within the data. When all survey results have been collected it was necessary to compile the data in an organized fashion and to use that format to analyze the outcome of the survey.

3.4.1 Compiling Results

Compilation of results is necessary to present data in a comprehensible format. While survey responses were put into a Microsoft Access database the result still needed to be presented in a usable form. The responses were sorted, tabulated and put into an excel file. From the excel file, tables or diagrams were used to show the results of the data to each question.

With each question a variety of filters were used to add usefulness to the presentation of the data. For many of the later questions it was possible to filter out those respondents that were uninterested in on-site service. Uninterested responses were not useful for many of the questions that only pertained to companies with some interest in on-site testing. Other filtering considerations included sorting data based on company size and client status. This type of sorting provided additional information regarding interest and benefit to these specific sub-categories.

3.4.2 Analyzing Results

The analysis of data requires a careful examination of the data compiled from the survey results. This process involved giving the results a valuable meaning. In order to give

meaning to the data collected an in-depth comparison of each question and diagrams are necessary. An examination of the responses from the desired information was established.

Within the analysis each of the sorted and filtered criteria established in compiling were considered. Comparison was made between the different categories and evaluated based on its potential significance for the Field Operations Department. In each comparison it was crucial that determinations were based on sufficient data. To many levels of categorization can lead to a small unrepresentative collection of data.

3.5 Determination of Market Direction

The last step involves the final recommendation to the Field Operations Department at DEMKO. The results were used to determine what course of action the Field Operations Department should take. At this stage the specific questions posed by DEMKO were considered to determine where the focus of Field Operations should be in the future. The primary considerations were to determine the size of the field operations market and where it is located. These involved determinations based upon previously mentioned filters that considered the impact of industry, size and client status. Together these factors were considered to depict the potential for DEMKO's field operations market.

4.0 Results

The survey was conducted by phone over a three-week period beginning 29 March and ending 16 April 1999. During that time 101 surveys were successfully completed. Of the completed surveys, 72 were completed by current DEMKO clients and 29 were completed by non-clients.

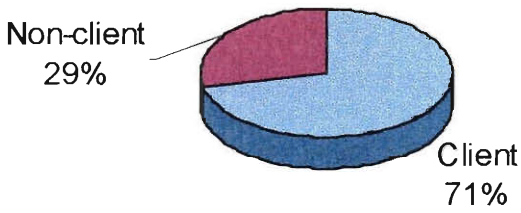
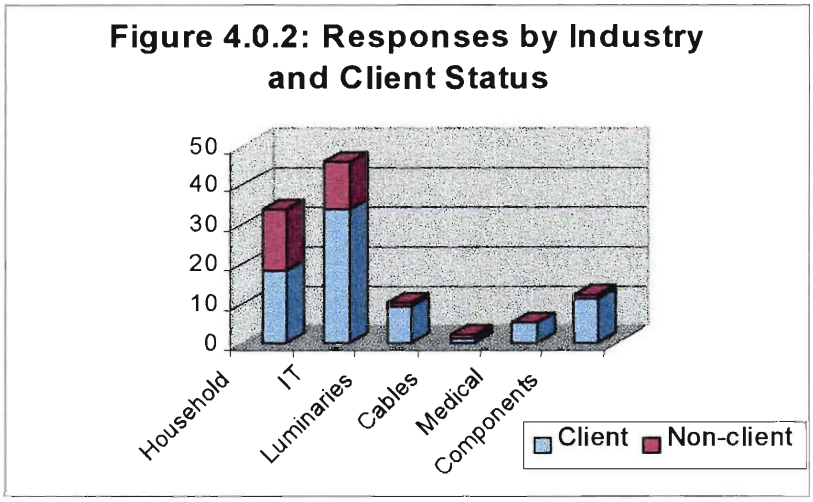


Figure 4.0.1 Client/Non-client Distribution

The focus for data collect was placed on the IT Equipment and Household Appliance industries. Companies producing Cables and Wires, Medical Equipment, Components, and Luminaries were also contacted. Table 4.0.1 shows the number of companies contacted in each industry by client and non-client status. As some companies belong to more than one industry totals are greater than the number of completed surveys. A graphical representation can be seen in Figure 4.0.2.

	Clients	Non-Clients	Total
Household	18	16	34
IT	34	12	46
Luminaries	9	1	10
Cables	1	1	2
Medical	5	0	5
Components	11	1	12

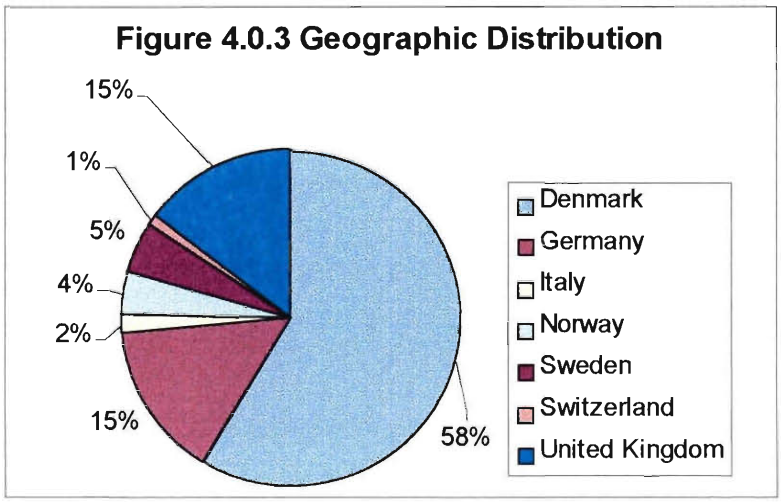
Table 4.0.1: Response by Industry and Client Status

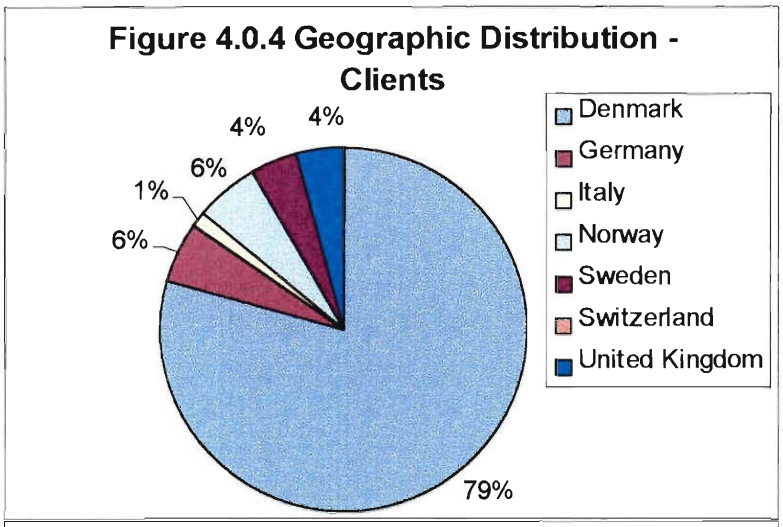


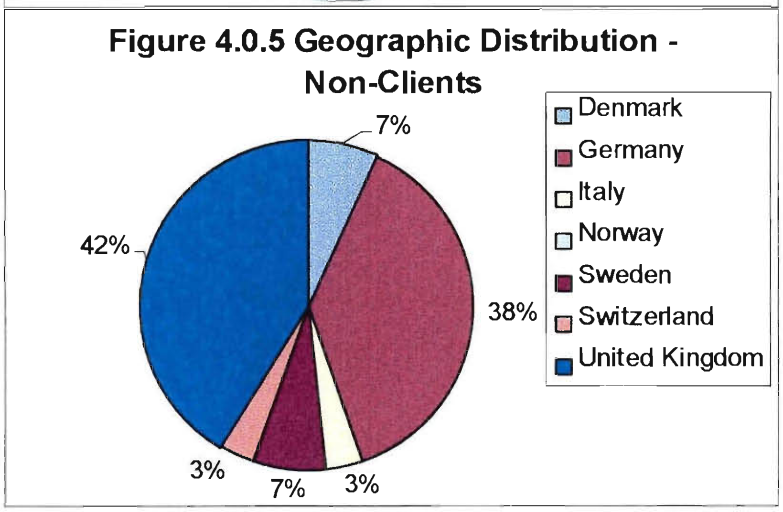
Geographically, the study was limited to Europe. Surveys were completed with companies from Denmark, Germany, Italy, Norway, Sweden, Switzerland, and the United Kingdom. In the case of multi-national companies, the location of the office completing the survey was used. Table 4.0.2 and Figures 4.0.3 thru 4.0.5 show the distribution of responses by nation and Client status.

	All	Clients	Non-Clients
Denmark	59	57	2
Germany	15	4	11
Italy	2	1	1
Norway	4	4	0
Sweden	5	3	2
Switzerland	1	0	1
United Kingdom	15	3	12

Table 4.0.2 Geographic Distribution by Client Status



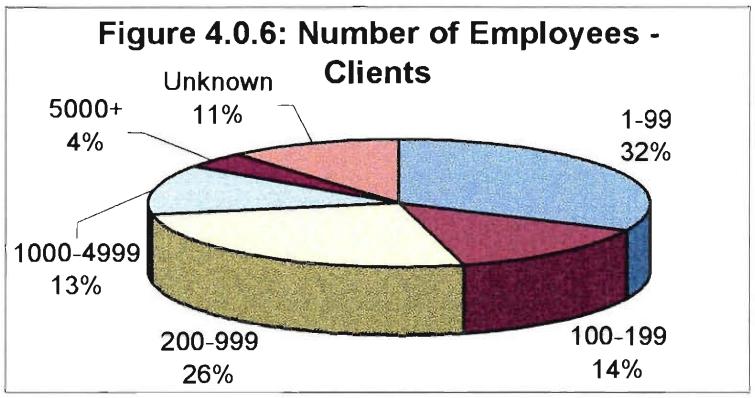


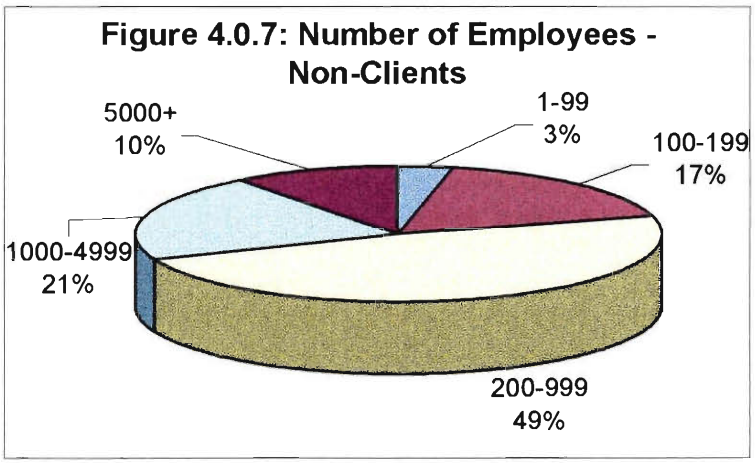


Size categories were developed based on the number of employees employed at a company. The categories used were 1-99 employees, 100-199 employees, 200-999 employees, 1000-4999 employees, and 5000+ employees. Table 4.0.2 shows the size categories of clients and non-clients. Figures 4.0.3 and 4.0.4 depict sizes of clients and non-clients respectively.

# of Employees	Clients	Non-Clients
1-99	23	1
100-199	10	5
200-999	19	14
1000-4999	9	6
5000+	3	3
Unknown	8	0

Table 4.0.3 Number of Employees

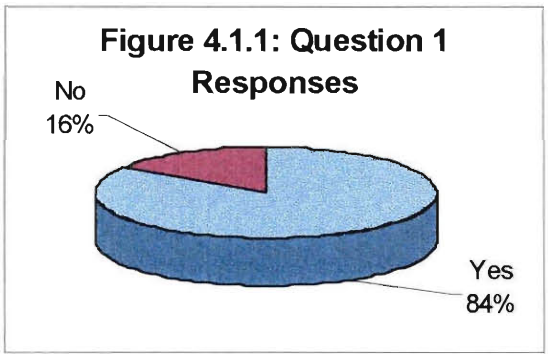




4.1 Question One Results

Question one stated, *"Does your company perform its own safety testing for your products?"* Respondents answering affirmatively were asked a follow-up question, "*On a scale from 1 to 5, 1 being very limited and 5 being able to perform all tests necessary for certification, how much lab equipment is available at your company for on-site certification of all your products?*"

Answers to Question 1 can be seen in Figure 4.1.1. Figures 4.1.2 and 4.1.3 represent the responses within the Household and IT Equipment Industries.



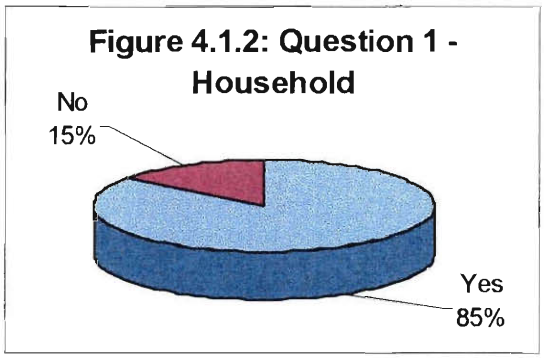


Figure 4.1.2: Question 1 - Household

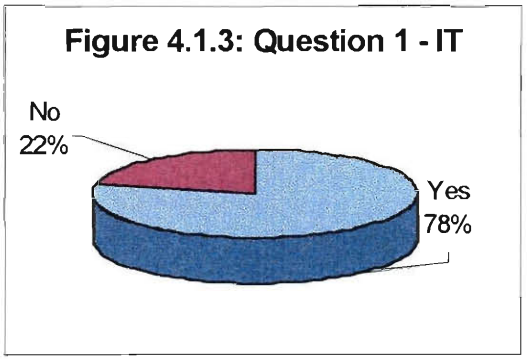


Figure 4.1.3: Question 1 - IT

Results from the follow up question 1a are represented in Table 4.1.1 and are broken down by number of employees. Data can be seen graphically in Figures 4.1.4 thru 4.1.9. It is important to notice that data is very limited for companies with 5000+ employees. This effects the reliability of these figures.

	All	1-99	100-199	200-999	1000-4999	5000+
1 - Very Limited	7	3	2	2	0	0
2 – Limited	15	5	3	2	1	1
3 – Average	22	5	2	7	4	2
4 – Extensive	22	3	4	10	4	0
5 - Fully Test Capable	18	4	1	5	5	3
Unknown	1	0	0	0	1	0

Table 4.1.1 Available Equipment by Number of Employees

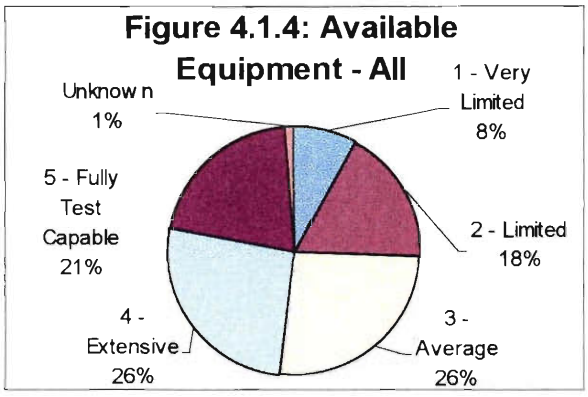
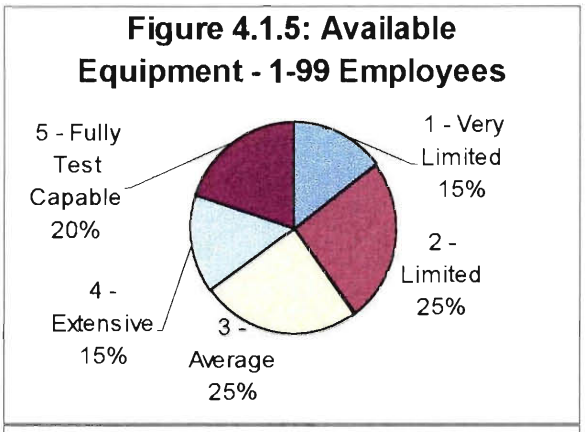
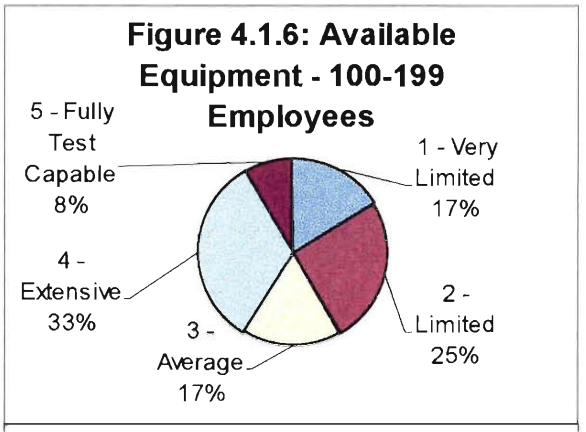
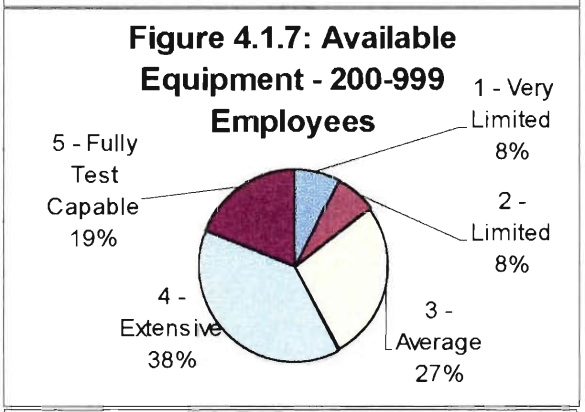
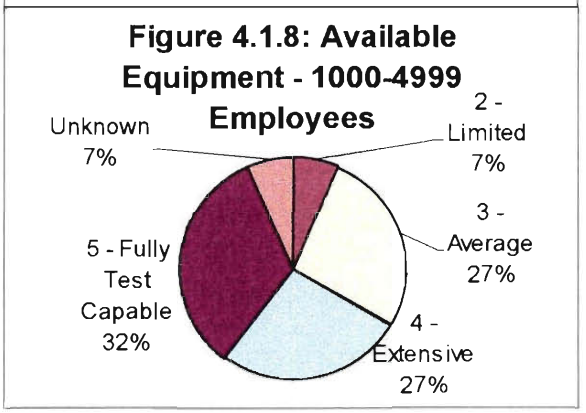


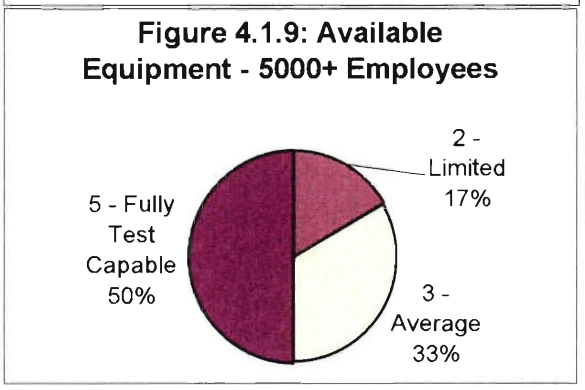
Figure 4.1.4: Available Equipment - All











4.2 Question Two Results

Question two reads, "*Does your company use third party testing?*" If answered affirmatively, the follow-up question, "*Would you please indicate with whom?*" provides an indication of what Certifying Bodies are being used by companies. Table 4.2.1 demonstrates the frequency of each Certifying Body being mentioned other than DEMKO. Figures 4.2.1 and 4.2.2 depict this information by number and as a percentage of clients or non-clients. DEMKO usage is already filtered by the client status. Certifying Bodies that were only

mentioned once were also not included. Because some companies used multiple companies and others were not included percentages do not equal 100%.

The information shows that with clients the largest competitor to DEMKO is SEMKO with 14 clients or 19,4% using SEMKO additionally. SEMKO is followed by UL and DEMKO with 10 clients (13,9%) each. Other frequently mentioned CBs included NEMKO (9), TÜV (8), and VDE (8). Within non-clients, VDE and UL were the most frequently used.

	Number		Percentage	
	Client	Non-Client	Client	Non-Client
BEAB	7	3	9,7%	10,3%
BSI	1	2	1,4%	6,9%
CSA	2	0	2,8%	0,0%
Delta	10	1	13,9%	3,4%
FIMKO	3	0	4,2%	0,0%
Kema	2	3	2,8%	10,3%
NEMKO	9	4	12,5%	13,8%
SEMKO	14	3	19,4%	10,3%
TeleLab	6	1	8,3%	3,4%
TÜV	8	4	11,1%	13,8%
UL	10	6	13.9%	20,7%
VDE	8	7	11,1%	24,1%

Table 4.2.1 CBs Used by Clients and Non-Clients

Figure 4.2.1: CBs used other than DEMKO

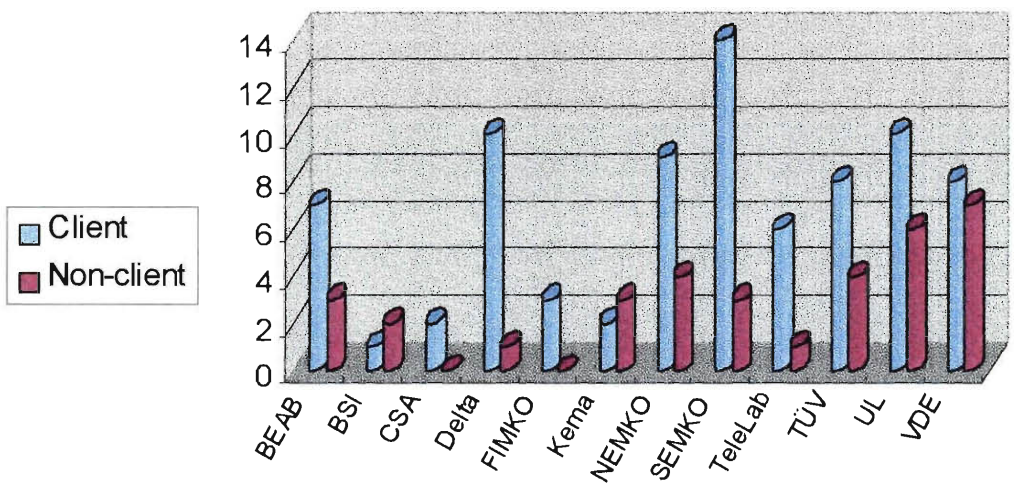
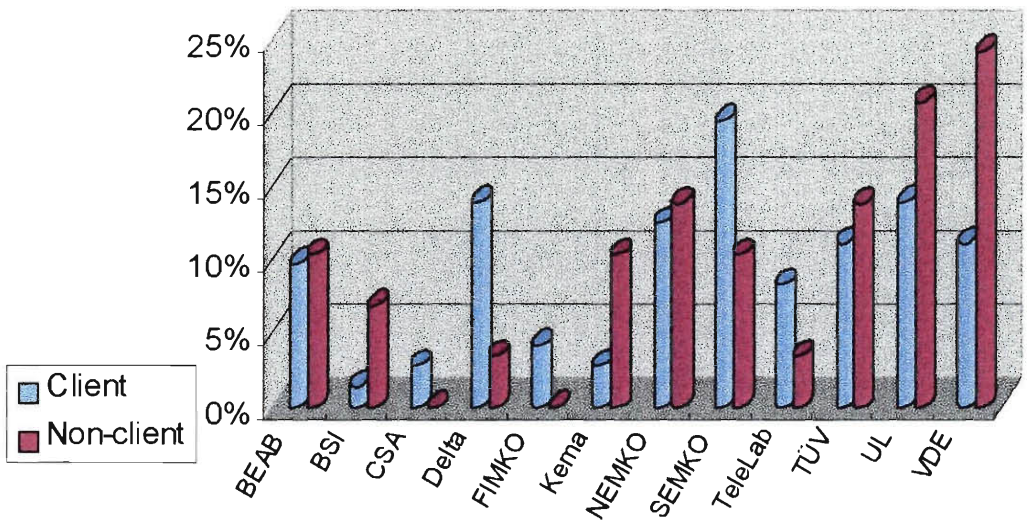


Figure 4.2.2: CBs used other than DEMKO by Percentage



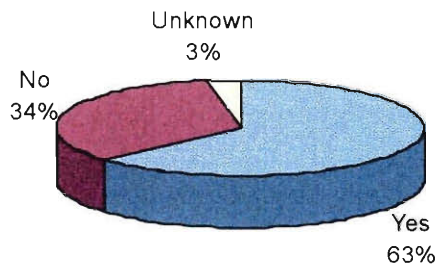
4.3 Question Three Results

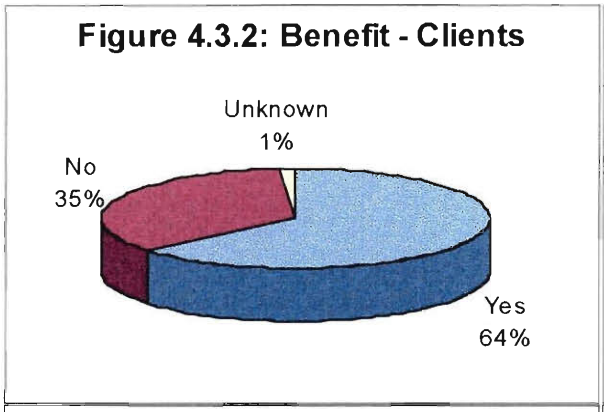
Question three was, "*Would your company benefit if your products were certified on site?*" Sixty-three percent of all that responded said their company would benefit. There was little difference in this percentage between clients and non-clients. A larger difference was observed based on industry. The household appliance industry indicated a larger potential benefit with 71% compared to 53% within the IT industry.

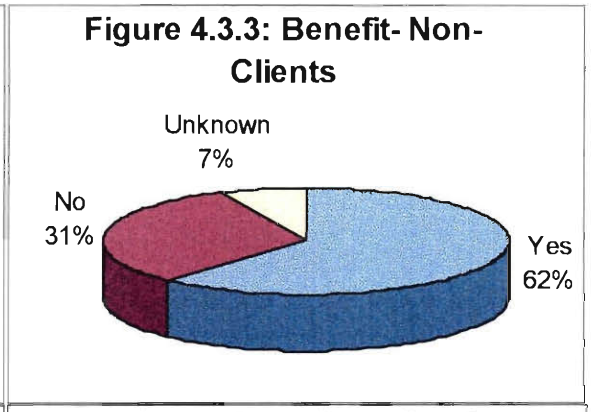
	All	Clients	Non-clients	Household	IT
Yes	64	46	18	24	24
No	34	25	9	9	20
Unknown	3	1	2	1	2

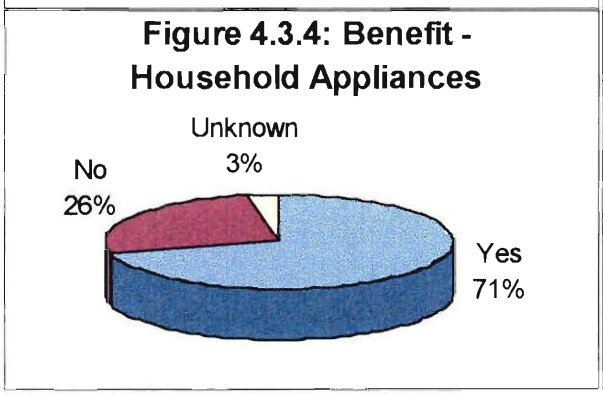
Table 4.3.1: Benefit by Client Status and Industry

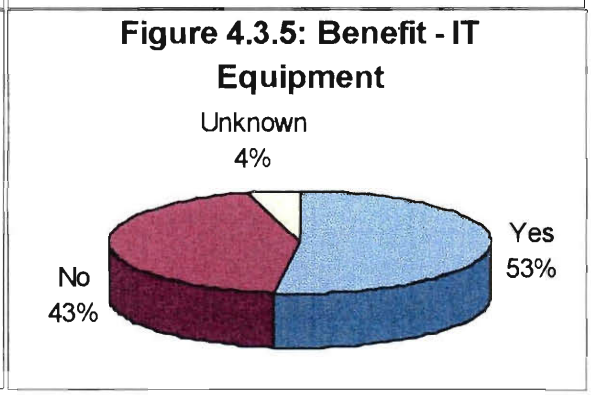
Figure 4.3.1: Benefit - All







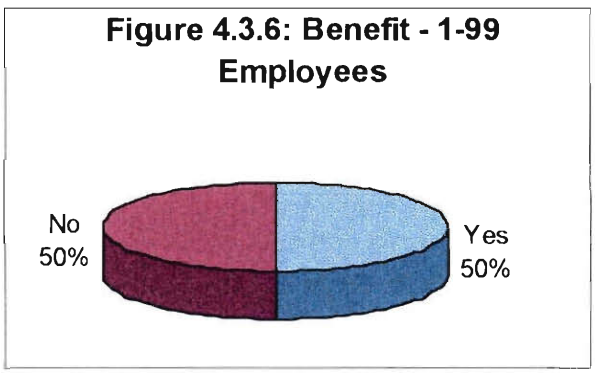




Company size provides another means of comparison. Table 4.3.2 uses number of employees as an indicator of company size.

	1-99	100-199	200-999	1000-4999	5000+
Yes	12	8	24	10	5
No	12	6	8	4	1
Unknown	0	1	1	1	0

Table 4.3.2 Benefit by Number of Employees



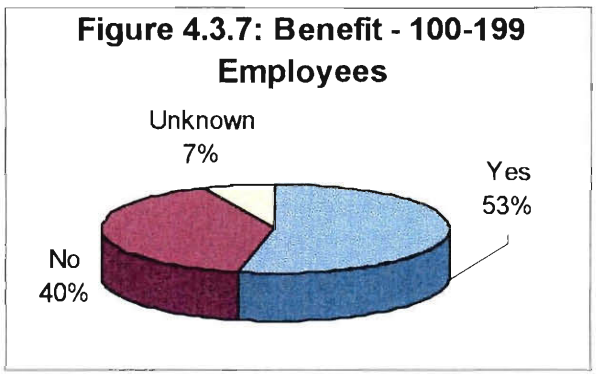


Figure 4.3.8: Benefit - 200-999 Employees

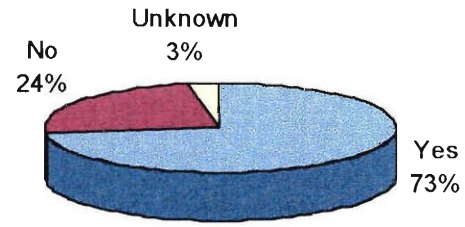


Figure 4.3.9: Benefit - 1000-4999 Employees

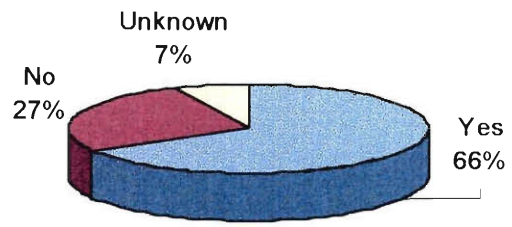
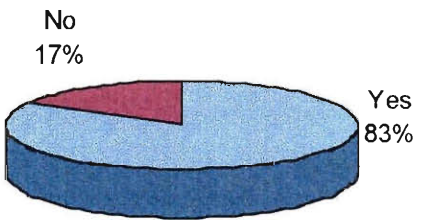


Figure 4.3.10: Benefit - 5000+ Employees



Question three also had a follow-up question that asked respondents to indicate what they felt the benefits of on-site testing would be. The following are the responses received from those who responded affirmatively to question three:

- *Faster and more possibilities*
- *Advantage*
- *In some cases it can be advantageous*
- *because it is a big advantage*
- *Shorter time period, testing according to companies time requirements*
- *Equipment and personnel are available on-site*
- *Customers demand third party*
- *Save time*
- *Helps development phase*
- *Changes could be made faster*
- *Free from responsibility*
- *More knowledge, faster*
- *It will be faster, cause the CB is on the spot*
- *Faster*
- *Currently undergoing economic analysis, hope is that cost will be cheaper with on-site*
- *Testing facilities are expanded*
- *Keeps it on site, easier to fix problems*
- *Time*
- *Would benefit when they make special standards*
- *Would benefit if EMC testing was available*

- *Big advantage*
- *Flexibility, speed*
- *Easier to get feedback, faster compliance*
- *Easier to solve problems when on the spot*
- *On-site EMC testing would be a great benefit*
- *Avoid misunderstandings*
- *Better cooperation*
- *Fix problems right away*
- *Benefit for development*
- *Faster, time saving*
- *Faster*
- *Large equipment is easier, quicker*
- *Would love to join the tests*
- *Faster turn around time*
- *Faster turn around time, easier solve problems*
- *Faster turn around time, more knowledge*
- *Time saving, follow development of product*
- *Time saving*
- *DEMKO has better knowledge to the product*
- *Save transport*
- *Turn over is faster*
- *Faster turnaround time*
- *On place, one location, shorter timeframe*
- *Save transport*
- *Speed, cost*
- *UL*
- *Easier*
- *Faster*
- *Finding problems sooner*
- *Quicker*
- *Minimize transport time and test time*
- *Easier, better specific tests*
- *Helpful for large products*

The Following are the reasons given by companies that responded negatively to Question 3:

- *Limited product line*
- *Turnaround time is not important*
- *Located not far from NEMKO*
- *Special explosive tests*
- *Not far from NEMKO*
- *Believes that EMC-test is physical impossible with their projects*
- *Easier to send it*
- *Next door(10 min. Drive),have limited tests*
- *Products are small*
- *Happy with current relations*
- *Safety testing equipment is located in Japan and Singapore*

- *Close enough that it is not a large factor*
- *East European countries wants a third party testing, other tests they send to DEMKO because company does not have the time and employees to do it*
- *Easy transport, next door*
- *Easier to send*
- *Maybe some if it is urgent, but this is rare*
- *small products, next door*
- *Don't think it would improve turnaround time enough to be worthwhile*
- *Not enough space*
- *They have invested in equipment to make all the necessary test for CE-certification*

4.4 Question Four Results

Question four enquires, "*On a scale from 1 to 5, 1 being very uninterested and 5 being very interested. How interested is your company in on-site service?*" Results are presented in Table 4.4.1 based upon industry and client status. Table 4.4.2 demonstrates the relationship between interest and company size as measured by the number of employees.

	All	Clients	Non-clients	Household	IT
5 - Very Interested	25	13	12	12	9
4 – Interested	23	19	4	9	10
3 – Neutral	19	15	4	5	7
2 – Uninterested	15	11	4	5	5
1 - Very Uninterested	18	14	4	3	15
Unknown	1	0	1	0	0

Table 4.4.1 Interest in On-Site Service

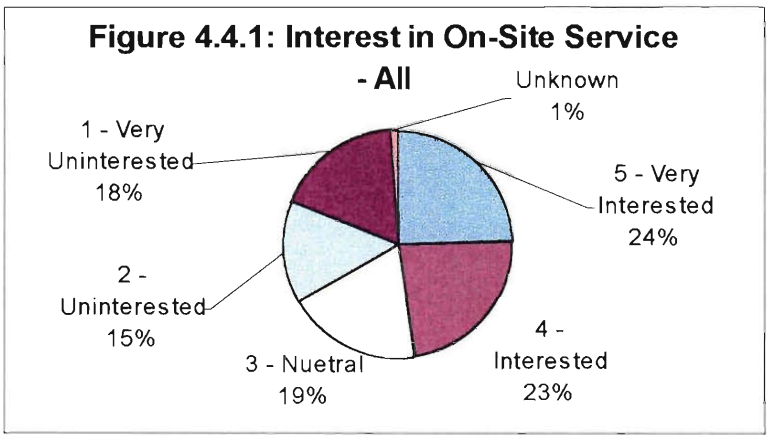


Figure 4.4.2: Interest in On-site Service Clients

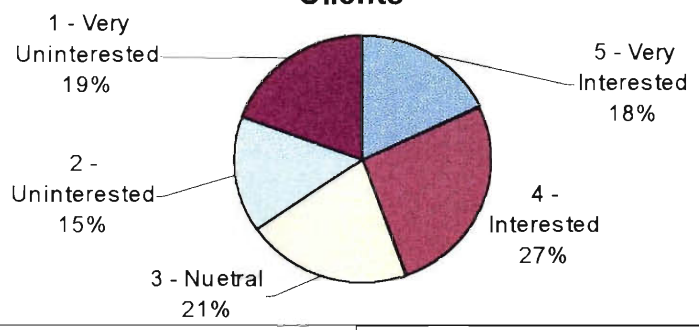


Figure 4.4.3: Interest in On-site Service Non-Clients

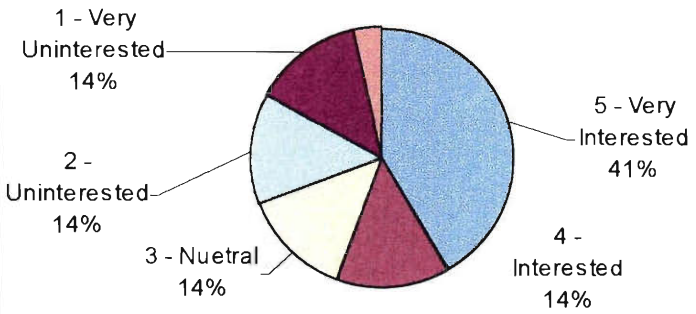


Figure 4.4.4: Interest in On-site Service Household Applainces

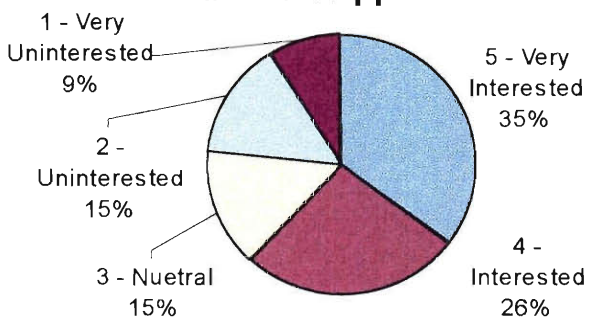
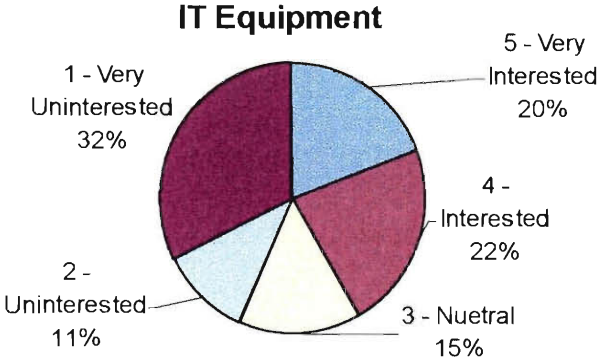


Figure 4.4.5: Interest in On-site Service IT Equipment



	1-99	100-199	200-999	1000-4999	5000+
5 - Very Interested	4	2	11	6	1
4 - Interested	6	1	6	5	3
3 – Neutral	4	3	7	2	1
2 – Uninterested	3	4	4	1	1
1 - Very Uninterested	7	4	5	1	0
Unknown	0	1	0	0	0

Table 4.4.2 Interest Based on Company Size

Figure 4.4.6: Interest - 1-99 Employees

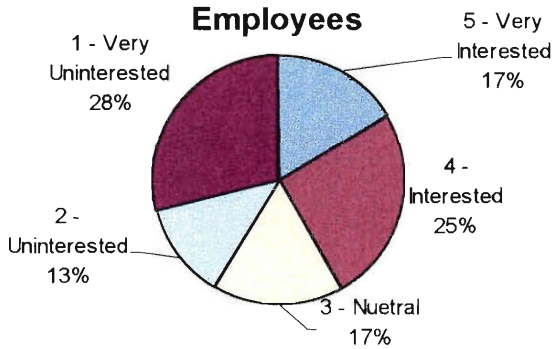


Figure 4.4.7: Interest - 100-199 Employees

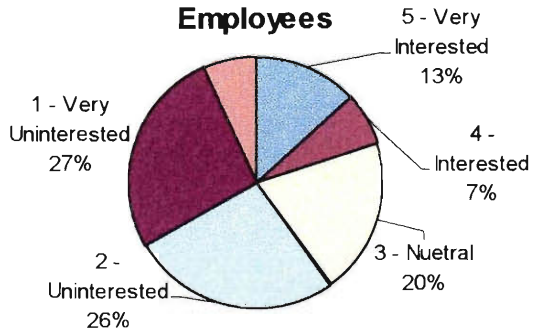
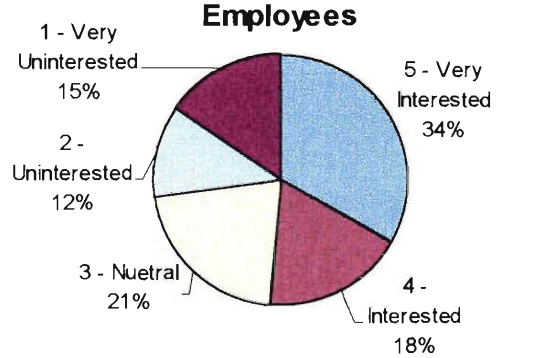
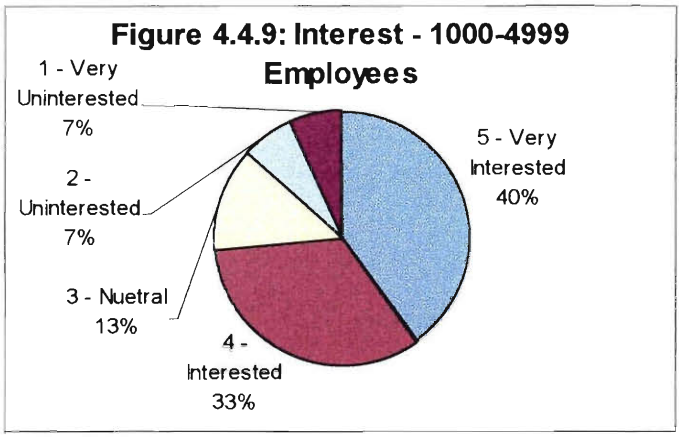
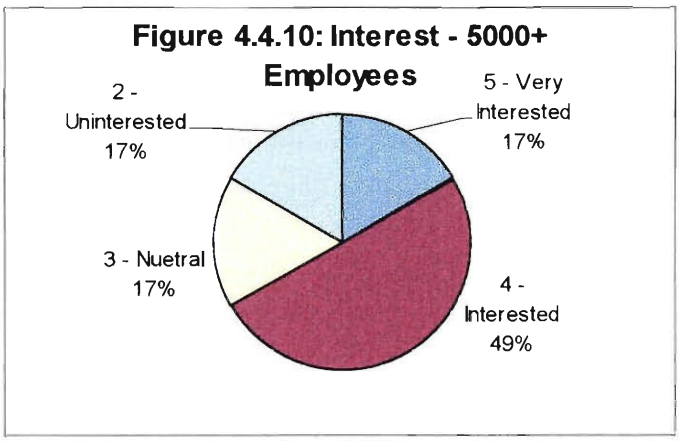


Figure 4.4.8: Interest - 200-999 Employees







4.5 Question Five Results

Question five states, *"Would your company consider using DEMKO in relation to on-site service?"* Responses found in Table 4.5.1 include only those who were neutral or interested in on-site certification (respondents who answered "1 – Very Uninterested" or "2 – Uninterested" to question 4 are not included).

	Client			Non-Client		
	Household	IT	All Industries	Household	IT	All Industries
Yes	13	16	44	3	4	7
No	0	1	2	8	2	10
Unknown	0	1	1	1	2	3

Table 4.5.1 – Potential DEMKO On-Site Usage

Figure 4.5.1: Potential DEMKO On-Site Usage

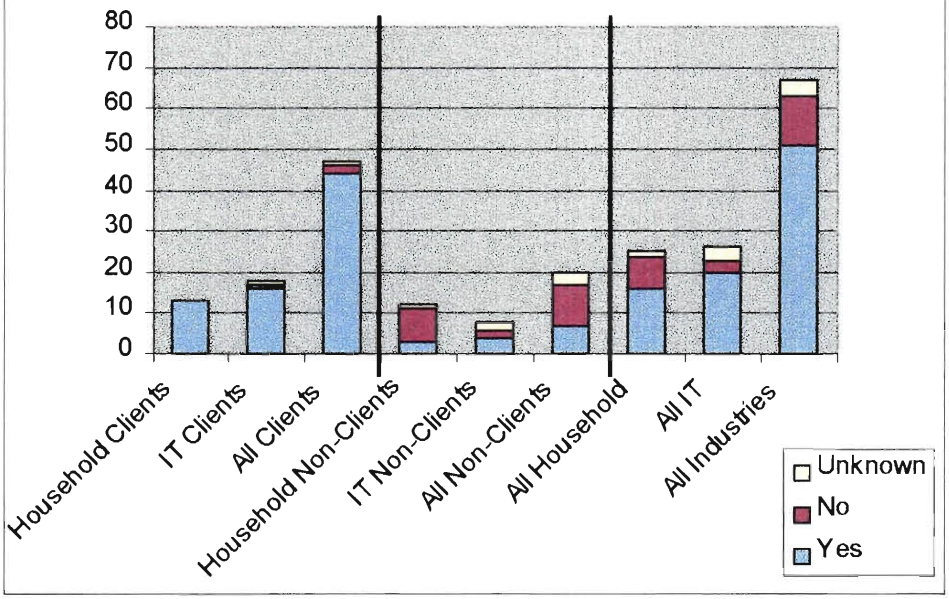


Figure 4.5.2: Question 5 - Clients - Household

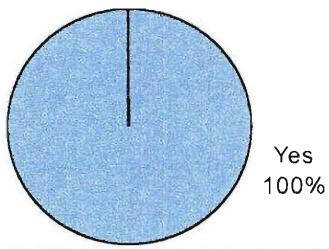


Figure 4.5.3: Question 5 - Non-Clients - Household

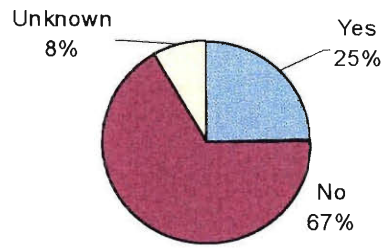


Figure 4.5.4: Question 5 - Clients - IT Equipment

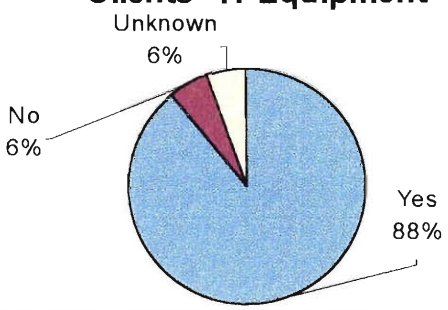


Figure 4.5.5: Question 5 - Non-Clients - IT Equipment

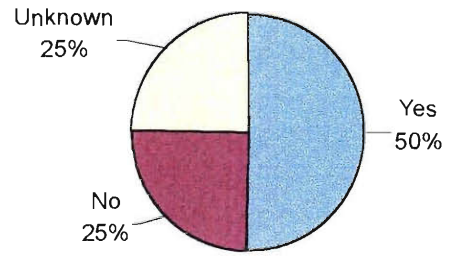


Figure 4.5.6: Question 5 - Clients - All Industries

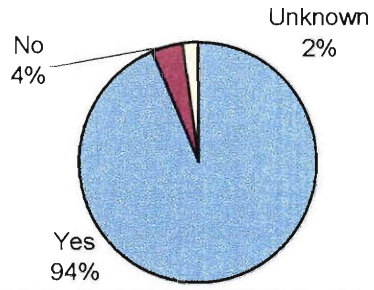
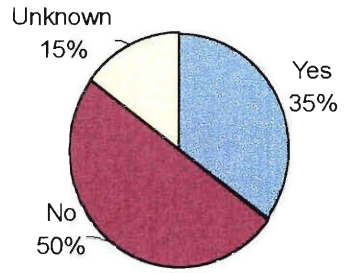


Figure 4.5.7: Question 5 - Non-Clients - All Industries



Question five also included a follow-up question that asked the respondents to explain why they would or would not consider using DEMKO in relation to on-site testing. The following were comments given by companies who answered affirmatively to question five:

- *Faster on-site*
- *UL certification*
- *Next door, Copenhagen is closer than Stockholm(SEMKO)*
- *Familiar with DEMKO*
- *Good cooperation*
- *Currently using DEMKO*
- *Dependant on cost, BSI is expensive, UL certification is important*
- *Have done it in the past*
- *Cooperation with DEMKO*
- *Most natural within Denmark*
- *Danish*
- *Always use DEMKO*
- *If the price is right*
- *Familiar with DEMKO*
- *Good cooperation*
- *Provided cost was right*
- *Knows DEMKO well*
- *UL relationship, Explosions department, and friendly*
- *Depends on markets available*
- *Knows the people at DEMKO, good cooperation*
- *Need for UL certification*
- *If good proposal*
- *Danish*
- *Has service today*
- *Reliable certifying body*
- *Already approve their equipment*
- *Existing relationship*
- *UL, price*
- *The only one in Denmark to do UL-test*

- *Currently using DEMKO*
- *Danish, next door*
- *Cooperation in the past*
- *Danish*
- *Next door, Danish*
- *Next door, good cooperation*
- *Danish, DEMKO has UL*
- *Only use DEMKO*
- *Good cooperation*
- *Only use DEMKO*
- *No SMT certification, needs DEMKO*
- *Good cooperation*
- *Good past relationship*
- *Next door*
- *Possible but currently have good relations with NEMKO*
- *Good cooperation*
- *Next door, Danish, customer desire*
- *Good cooperation*
- *Next door, only using DEMKO*
- *Danish, cooperation*
- *Good cooperation w/ DEMKO*

The following are the comments made by companies that responded negatively to question five:

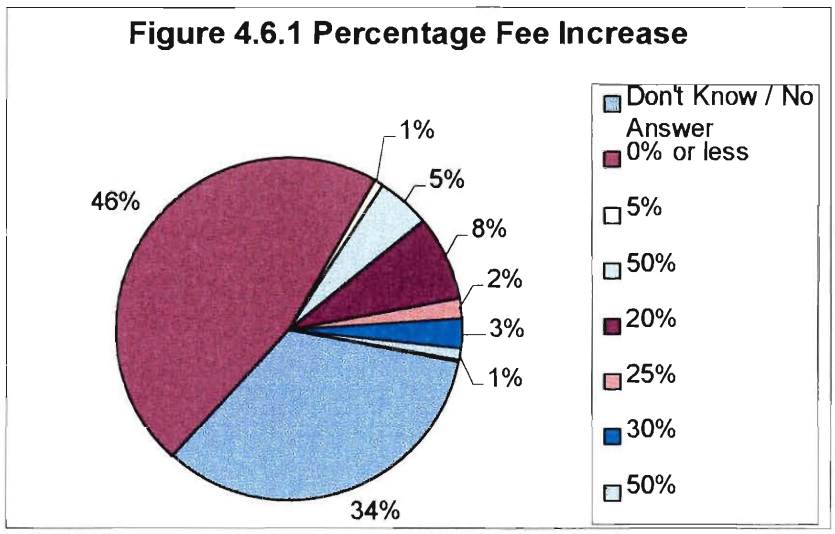
- *Good cooperation with UL in Melville, NY*
- *Relationship with VDE*
- *IMQ is closer, using TMP with IMQ*
- *Good relations with VDE*
- *Focus on Italian and German agencies*
- *Good relations with current certifying bodies*
- *Relationship with VDE*
- *Working with institute in Berlin, German standards*
- *Use SMT with another company*
- *Relations with Schindler*
- *Limited expertise in product areas*

4.6 Question Six Results

The sixth survey question asked, "*On-site service means quicker certification. In terms of percentage, how much more would your company be willing to pay for on-site service?*" A large percentage of respondents, 34%, did not know or were unable to provide an answer. The greatest percentage on answering respondents, with 46%, indicated they would not pay more or would pay less for on-site service. Responses tabulated in Table 4.6.1, and represented in Figure 4.6.1 include all respondents.

Don't Know / No Answer	34
0% or less	47
5%	1
50%	5
20%	8
25%	2
30%	3
50%	1

Table 4.6.1 Percentage Fee Increase



4.7 Question Seven Results

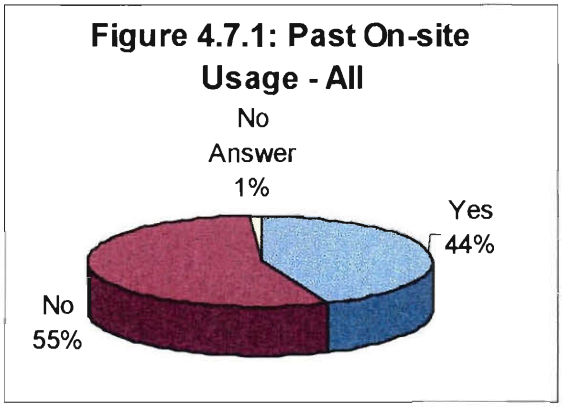
Question 7 asked respondents, "*Has your company used on-site services before?*" Of all the respondents, 44% indicated they had used on-site testing at some point in time.

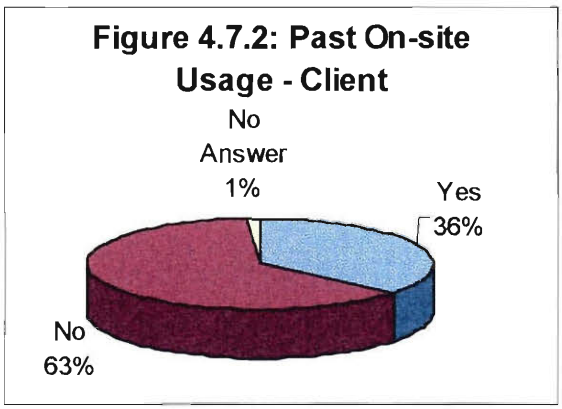
Previous on-site experience included a variety of testing programs from testing on location of a single large product to companies with existing SMT agreements on many product lines.

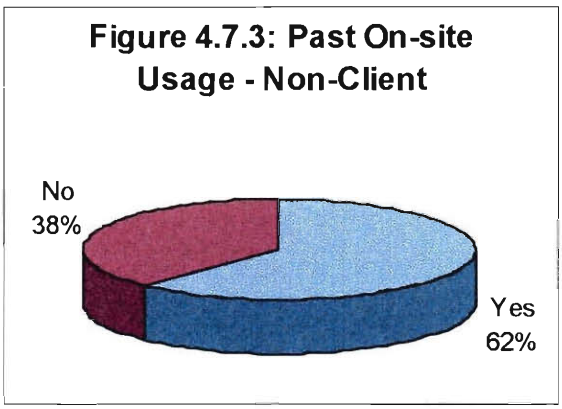
Table 4.7.1 shows on-site usage based on client status and industry type.

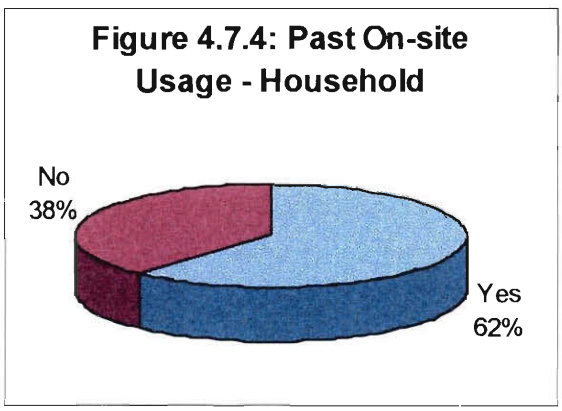
	All	Client	Non-Client	Household	IT
Yes	44	26	18	21	19
No	56	45	11	13	25
No Answer	1	1	0	0	0

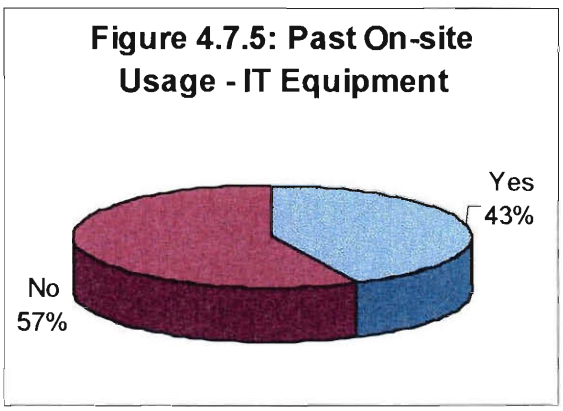
Table 4.7.1 Past On-site Usage











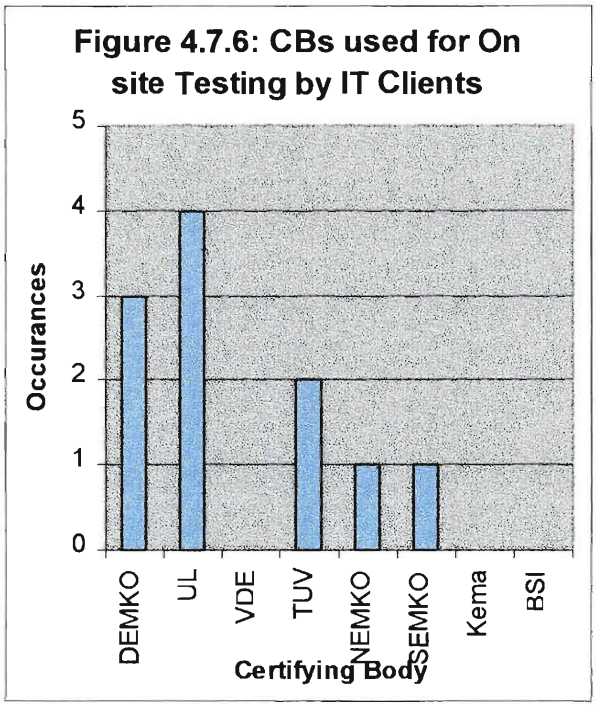
For companies that had performed on site testing in the past, two follow up questions determined what products were tested and what CB was used for on-site testing. The following list presents the responses given by companies relating to the products tested on-site:

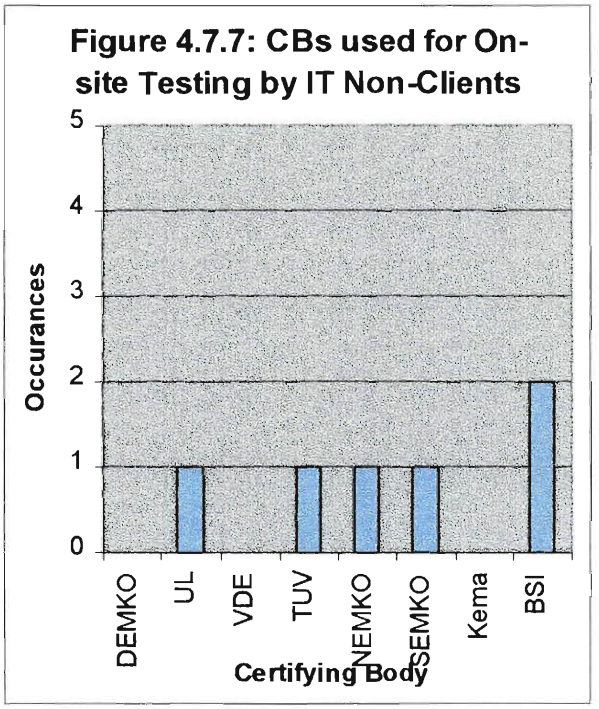
- *Vending Machines*
- *Coffee makers*
- *IT equipment*
- *component power supplies, 950, 1050, 601*
- *Industrial controllers, Compressors, Household controls*
- *Cooling, Bottle Cooler, Ice Cream Machine*
- *Water heaters*
- *PSUs, complete systems*
- *Ventilators*
- *Transmitters*
- *Rack systems*
- *Televisions, monitors*
- *Once had EMC testing done*
- *Cooling, Refrigerators*
- *Fan heaters, electric barbecue grills*
- *Commercial Ice Cream Machine*
- *Telecommunication equipment*
- *Microwave ovens*
- *Refrigerators, freezers*
- *Only for rigging*
- *Microwave ovens*
- *Washing Machines, Dryers, dish washers*
- *Industrial dryers*
- *Washing machines*
- *Internet equipment*
- *High Pressure cleaners*
- *DEMKO uses equipment at NKT*
- *Programmable Controllers*
- *Shavers, kitchen machines, hair dryers, water cookers*
- *Kitchen machines (very limited)*
- *Hot Air guns, Glue pistols, voltage tester, motion detectors, luminaries*
- *Post processing machines*
- *AV products, PC parts*
- *Film processors, UL122, IEC 950, photo equipment*
- *Telecom products (telecom test)*
- *EMC testing*
- *Electromagnetic Suppression Capacitors*
- *Rainchutes (ventilation)*

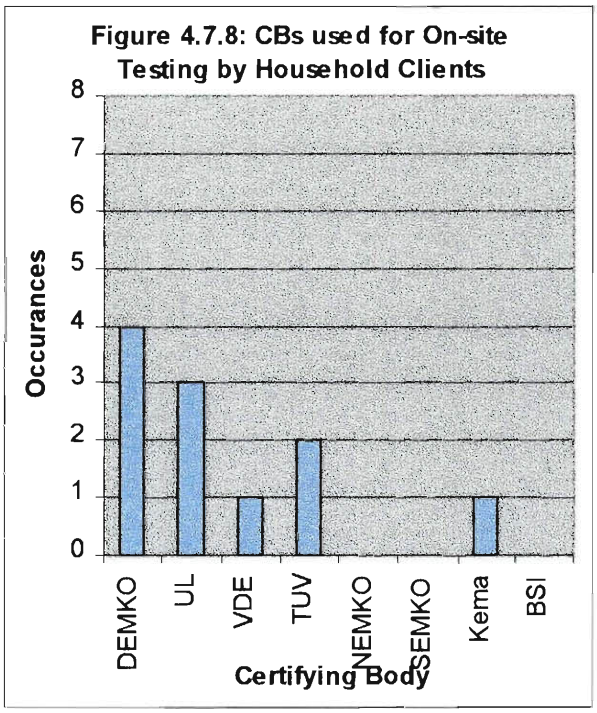
Table 4.7.2 shows the frequency of CBs used by companies who stated they had previously used on-site testing. Only those CBs who were mentioned by multiple companies have been included in the table.

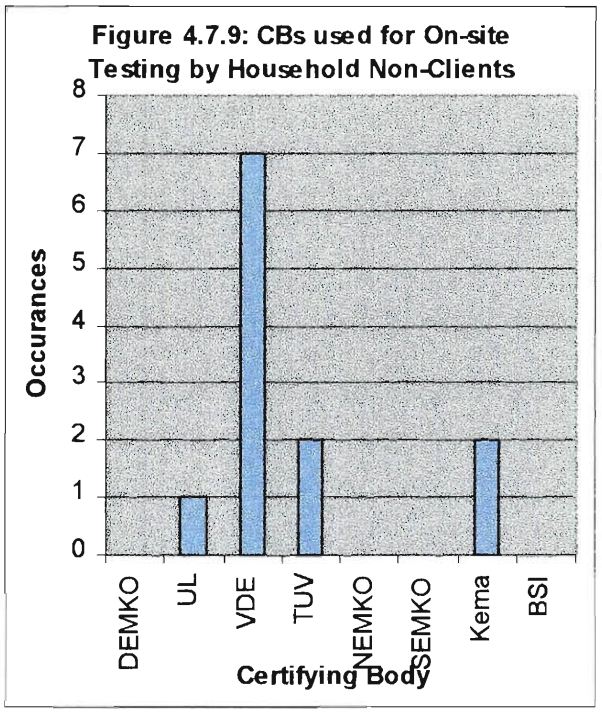
	IT Clients	Household Clients	All Clients	IT Non-Clients	Household Non-Clients	All Non-Clients
DEMKO	3	4	9	0	0	0
UL	4	3	8	1	1	2
VDE	0	1	3	0	7	7
TUV	2	2	4	1	2	3
NEMKO	1	0	1	1	0	1
SEMKO	1	0	1	1	0	1
Kema	0	1	1	0	2	2
BSI	0	0	0	2	0	2

Table 4.7.2 CBs Previously Used for On-Site Testing









The following is a list of reasons given by companies that indicated they had never used on-site testing before:

- *Not Necessary*
- *No advantage, saves only transport*
- *Did not know it existed (19)*
- *Do not have test facility*
- *Haven't had a need*
- *Very close to NEMKO*
- *More convenient to send it to lab. Take up time of small HR department*
- *Satisfied with current arrangement*
- *The equipment for temperature test can't be moved*
- *EMC-test is to complicated to do on-site*
- *Hasn't been a need*
- *Satisfied with things now*
- *No interest*
- *Has not been necessary*
- *Weren't equipped*
- *Does not apply*
- *Next door(10 min. Drive),have limited tests*
- *Easiest*
- *No need*
- *Not requirement*
- *To expensive with VDE*
- *Had no need for it*

- *Did not have the test facilities before this year*
- *Not applicable*
- *Easier to send*
- *Hasn't been a need*
- *More facilities on-site*
- *Small products*
- *Didn't feel the advantages were large*
- *Components are approved by suppliers*
- *Not interested in On-site*
- *Hasn't been necessary, design was done in Japan*
- *Test themselves for CE*

In total 19 companies mentioned that they had never heard of on-site testing before. 18 of these companies were DEMKO clients. Two of these companies that had never heard of on-site testing (Triax A/S and CBH Lighting), indicated they would be very interested in on-site testing. Additionally, six other companies (Chartec Lab., Riegeus A/S, Inelco, Nilfisk-Advance, DanaCom, and Medtronic Functional) indicated they would be interested in on-site testing, and seven companies indicated neutral feelings about on-site testing. All 18 clients indicated either that they would be willing to use DEMKO in relation to on-site (16 companies), or that they were unable to give an answer based on a lack of pricing and service knowledge in the area.

4.8 Question Eight Results

Question eight asked of respondents, "*What type of products does your company currently have tested?*" Responses to this question can be found within the company reports located in Appendix F. Products mentioned included a wide variety of products and product areas within each industry.

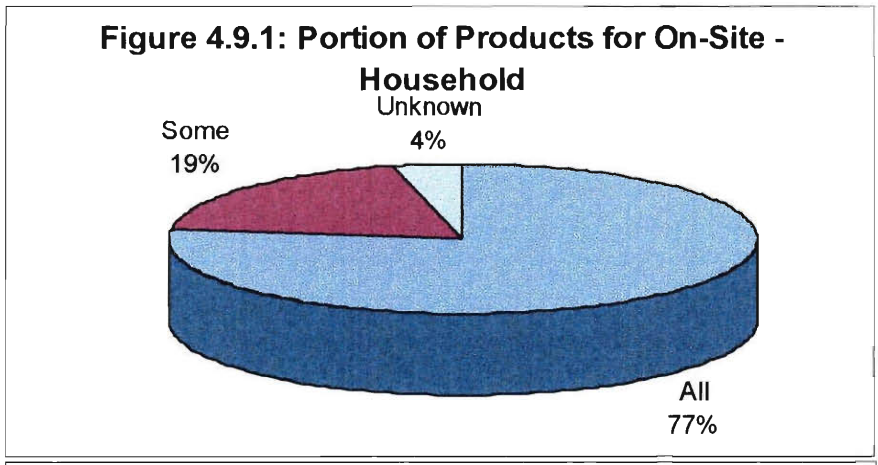
4.9 Question Nine Results

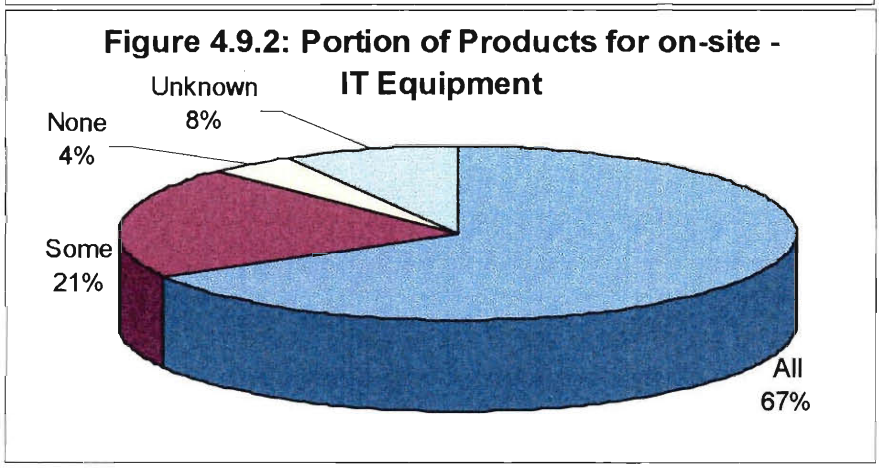
Question nine queried, *"What type of products would your company consider testing on-site in the future?*" Individual responses by company can be found in the company reports

located in Appendix F. In general, answers to question nine can be related to the answers for question eight to determine if companies would consider on-site testing of all, some, or none of their product lines. Results depicted in Table 4.9.1 and Figures 4.9.1 and 4.9.2 are filtered so that companies that were uninterested or very uninterested in on-site testing have not been included.

	Household	IT
All	20	16
Some	5	5
None	0	1
Unknown	1	2

Table 4.9.1 Comparison of Question 8 and 9



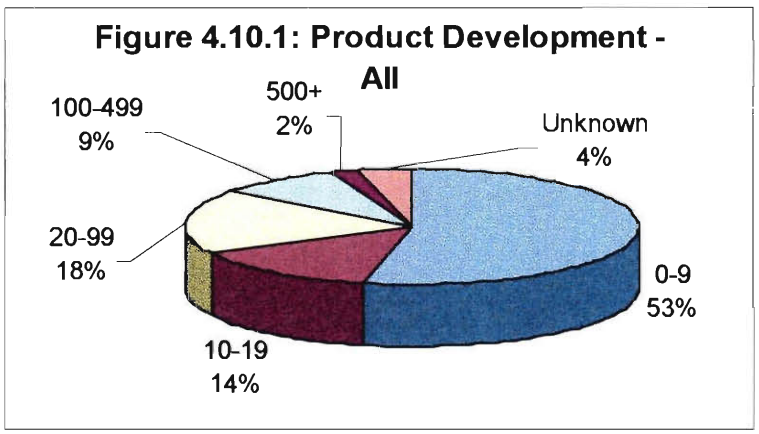


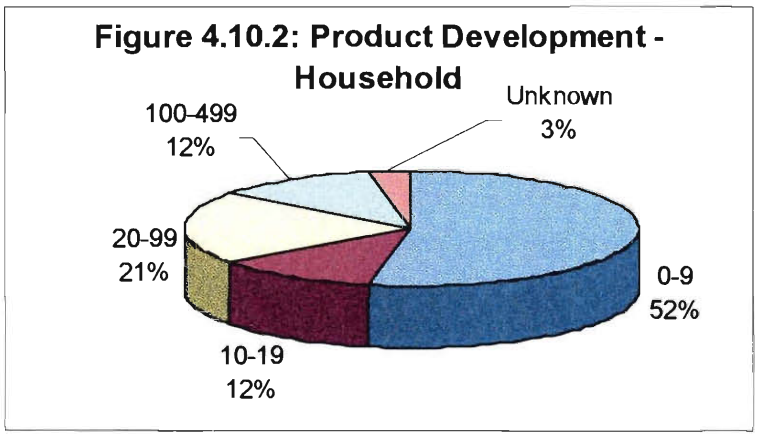
4.10 Question Ten Results

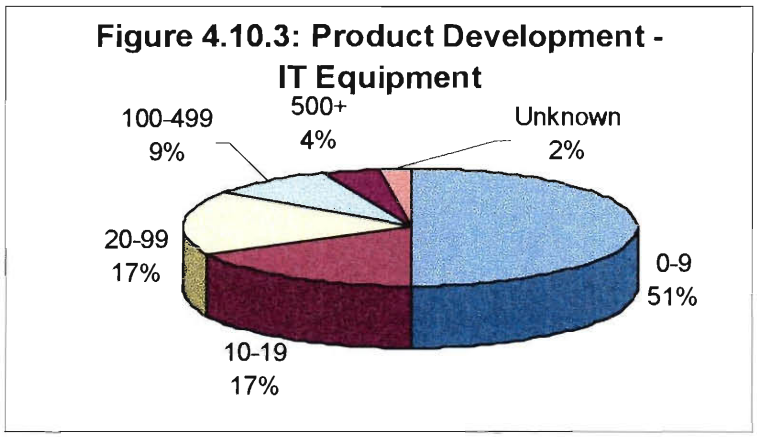
Question ten asks, "*During the next two years, approximately how many products would you believe that your company would have safety tested?*" Answers are presented within ranges determined after data collection. Results are presented in Table 4.10.1 based upon industry.

	All	Household	IT
0-9	54	18	23
10-19	14	4	8
20-99	18	7	8
100-499	9	4	4
500+	2	0	2
Unknown	4	1	1

Table 4.10.1 Number of Products Tested by Industry







4.11 Question Eleven Results

Question 11 refers to question ten and asks, *"How many of those products would your company consider using for on-site testing?"* Answers for individual companies can be found in the company reports found in Appendix F. A comparison can be made between questions ten and eleven similar to the comparison made between eight and nine. Due to the two-year criteria placed on question ten, comparison between ten and eleven gives a better indication of a companies potential usage of on-site testing in the short term.

Table 4.11.1 and Figures 4.11.1 thru 4.11.4 presents a comparison of questions ten and eleven by indicating the relative number of products (All, Some, None, or Unknown) companies would consider using for on-site testing. Companies that were uninterested or very uninterested in on-site testing have not been included in the comparison.

	Client	Non-client	Household	IT
All	13	9	9	9
Some	14	6	9	5
None	4	0	0	3
Unknown	16	5	8	8

Table 4.11.1 Comparison of Questions 10 and 11

Figure 4.11.1: Question 10 and 11 Comparison- Client

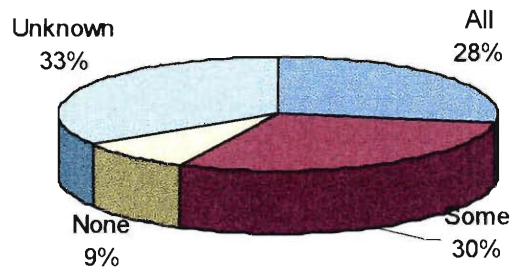


Figure 4.11.2: Question 10 and 11 Comparison- Non-Client

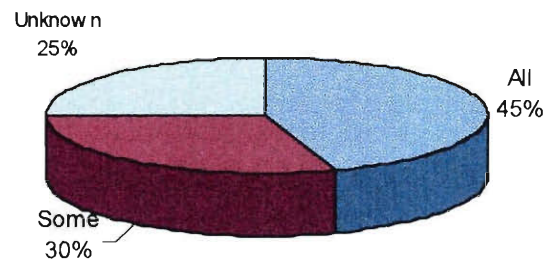


Figure 4.11.3: Question 10 and 11 Comparison- Household

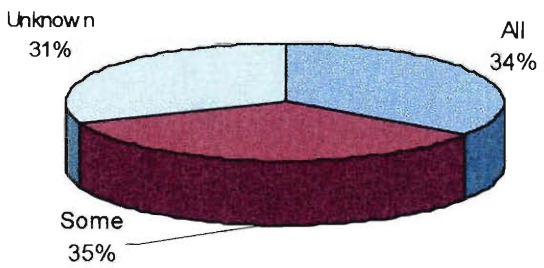
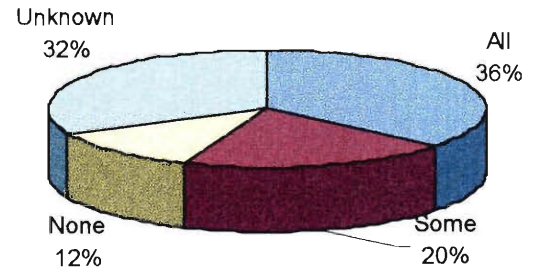


Figure 4.11.4: Question 10 and 11 Comparison- IT Equipment



A large percentage of respondents were unable to give an answer to question 11 at the time of questioning. Companies that indicated a reason why they could not give an answer indicated that it would depend on price and procedure. Additionally, several companies that indicated a usage for on-site testing for only some of their products gave reasons or criteria for using on-site service. These criteria included:

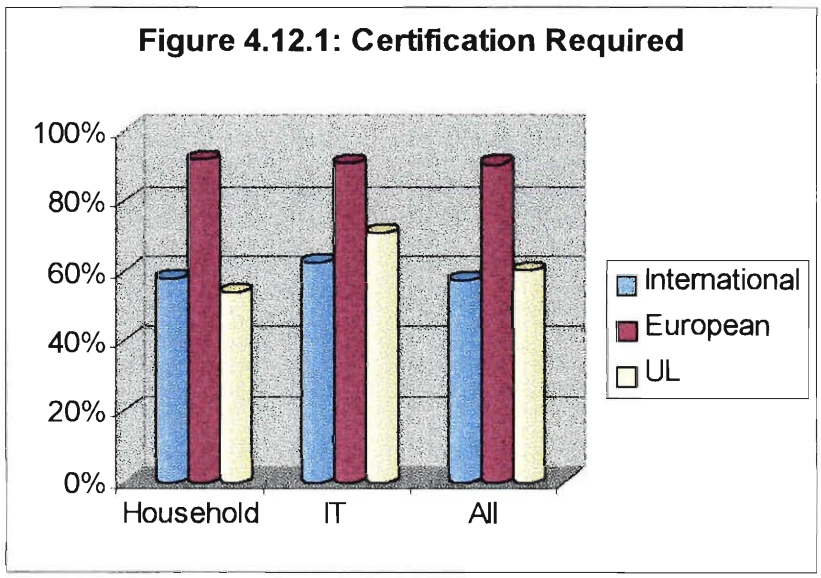
- *Only UL certifications*
- *Only big ones* [products]
- *Special situations*

4.12 Question Twelve Results

Question twelve states, "*In relation to on-site service would your company need to certify your products according to International, European, or UL standards?*" It was possible for respondents to answer with any combination of the three certification schemes. Table 4.12.1 provides data of the answers given by companies based on industry. Figure 4.12.1 shows graphically the percentage of companies in each industry that would require certification of each scheme. Companies that indicated they were very uninterested or uninterested have not been included.

	Household	IT	All
International	2	3	6
European	8	4	18
UL	1	2	3
International and European	2	0	3
European and UL	2	3	8
International and UL	1	0	3
All Categories	10	12	27

Table 4.12.1 Certification Schemes Required



4.13 Question Thirteen Results

Question thirteen asks, "On a scale from 1 to 5, 1 being very unimportant and 5 being very important, how important is turn around time?" The frequency of response can be found in Table 4.13.1. The average score for all respondents was 4,40.

	IT	Household	All
1 – Very Unimportant	0	0	0
2 – Unimportant	1	1	2
3 – Neutral	5	5	14
4 – Important	14	6	26
5 – Very Important	23	22	58
Don't Know	1	0	1
Average	4,37	4,44	4,40

Table 4.13.1 Importance of Turn Around Time

4.14 Question Fourteen Results

Fourteen questions, "*On a scale from 1 to 5, 1 being very unimportant and 5 being very important, how important is cost?*" The frequency of response can be found in Table 4.13.4. The average score for all respondents was 3,82.

	IT	Household	All
1 – Very Unimportant	0	0	0
2 – Unimportant	5	6	11
3 – Neutral	16	9	31
4 – Important	9	7	24
5 – Very Important	14	12	35
Don't Know	0	0	0
Average	3,73	3,74	3,82

Table 4.14.1 Importance of Cost

4.15 Question Fifteen Results

Question fifteen inquires, "*What countries does your company export to?*" Answers for each company can be found in the company reports contained within Appendix F. The following is a listing of responses given by companies. Responses that were given multiple times have the number of occurrences palace in parentheses after the response.

- *All Europe, USA, Canada, Arabia*
- *All of Europe*
- *Eastern Europe, China, England, Germany, Europe, US*
- *England*
- *EU (5)*
- *EU and Switzerland*
- *EU and some Asian*
- *EU and USA (2)*
- *EU, Hong Kong, Australia*
- *EU, Japan, USA, South Africa, South America, Russia*
- *EU, Norway, East Europe*
- *EU, Norway, South Africa, Canada, USA, Australia*
- *EU, USA, Iceland*
- *EU, Australia, Far East*
- *Europe (8)*
- *Europe, Canada, USA*
- *Europe, Far East, Australia, South Africa, South America, Middle East*
- *Europe, Far East, South America*
- *Europe, Korea*
- *Europe, US, Canada, Far East (2)*
- *Europe, USA (3)*
- *Europe, Worldwide (2)*
- *France, Holland, Germany, Italy*
- *North America, Europe*
- *Norway, Finland, Netherlands, UK*
- *Norway, Sweden, Germany*
- *Scandinavia*
- *Scandinavia, Eastern Europe, America, Far East*
- *Supply only Danish companies who export Worldwide*
- *Sweden, Germany*
- *UK, Germany, Finland, Thailand*
- *USA, Europe, Far-east*
- *West Europe, USA*
- *Worldwide (45)*
- *Worldwide except USA (3)*
- *Worldwide except Russia, China, South America*
- *Worldwide except North America*
- *Worldwide, mainly in Europe*

5.0 Analysis of Results

5.1 Analysis of Sample Population

The quantity of data collected during the conduction of the survey exceeded the goals set for data collection. Goals in each of the target industries as well as overall number of surveys were exceeded by a large margin. The larger number of responses increases the reliability of the information collected.

Geographically, Figure 4.0.3 demonstrates that 58% of the surveys were conducted with companies within Denmark. This percentage compares closely to the 55% of DEMKO's Key Accounts that are Danish (*Key Account Analysis, p 4)*. This correlation between survey demographics and client demographics represents that the data can be considered representative of the target population.

The demographics of the non-clients are shifted towards a heavier population of German and British based respondents. This shift will play an important role in considering the different regional differences that effect other areas of analysis. Different nationalities represent different histories of testing standards, different certification marks and possibly different CB loyalties as evident by their status as non-clients.

In terms of size, it is important to observe that the non-clients contacted during the survey were on average larger than the contacted clients. The greatest percentage (32%) of clients lies within the 1-99 employees size category. Conversely, the greatest percentage (49%) of non-clients reported having 200-999 employees. As another indicator, a total of 31% of non-clients had over 1000 employees compared to only 17% of clients.

5.2 Safety Testing and Equipment

A majority of companies within the survey population currently perform some level of safety testing. Within all industries, 84% of companies indicated that they do perform safety testing of their products. There is little variation based upon the industry as 85% of household appliance companies and 78% of the IT industry reported having performed safety testing. This indicates that a large percentage of companies are performing some level of testing on their own. Depending on the extent of such testing this can be used in some cases as a basis for future field operations.

Of those companies that perform their own safety testing it can be seen that 21% of companies have all equipment on-site that is necessary for certification of their products. This percentage, which represents 18 companies, represents a group of companies that could potentially make use of an SMT agreement or CDTP agreement for UL standards. Some of the companies in this category did mention having an SMT/CDTP agreement but no definite data is available on how many do or do not have SMT/CDTP agreements.

It is apparent that there is a correlation between the size of the company and the amount of testing equipment available. Within the companies with 1-99 employees, only 35% of companies indicated that their testing facilities were extensive or capable of performing all tests necessary for certification. Among companies with 100-199 employees this percentage rose to 41%. Larger companies, in the 200-999 and 1000-4999 employee range, saw the same percentage rise to 57% and 59% respectively. Among companies with over 5000 employees this figure drops slightly to 50% but is based on a sampling of only 6 companies with more than 5000 employees, and is correspondingly less accurate.

5.3 Usage of Competing CBs

It is already known that many of DEMKO's clients use CBs other than DEMKO (*Key Account analysis, p 5).* Question 2 provides some input into which CBs are being used by clients and non-clients. Among clients the largest competitor is SEMKO with 14 companies or 19,4% of clients indicating using them as a CB. Other large competitors include Delta (10 – 13,9%), UL (10 – 13,9%), NEMKO (9 – 12,5%), TÜV (8 – 11,1%), and VDE (8 – 11,1%).

The high standing of UL as a "competitor" is a positive indication that UL certification and service is required. UL is also the second largest "competitor" among non-clients with 6 occurrences representing 20,6%. It is conceivable that DEMKO's relationship with UL may yield future business with those companies that have used UL in the past for access to North American markets.

The other large competitors among clients represent CBs in relatively close proximity to Denmark. Because the greatest percentage of clients contacted are located within Denmark this may indicate a tendency towards using CBs nearby a company's location. This tendency is also evident among non-clients where the German CBs, TÜV (4 – 13,8%) and VDE (7 – 24,1%), represent two of the largest competitors among non-clients (38% of which were German companies).

5.4 On-Site Benefit

Nearly two thirds of companies, 63%, indicated that they would benefit from on-site certification. There is almost no difference between the perceived benefit by clients (64%) and non-clients (62%). Industry, however, provides a greater difference in benefit. Within the household appliance industry 71% companies saw on-site certification as a benefit opposed to only 53% within the IT industry. It is unclear why the IT industry has a lower percentage indicating they would benefit than the household appliance industry. Even with a

lower percentage, over half of the IT companies indicated they saw the benefit for on-site testing. This represents 24 companies that could potentially use on-site testing and certification.

Company size does play a noticeable factor in the benefit to a company. Based on Table 4.3.2 and Figures 4.3.6 thru 4.3.10, larger companies more often responded that they would benefit from on-site testing. Again, even companies on the lower end of the spectrum still have a significant portion perceiving a benefit from on-site testing and certification. Among companies with 1-99 employees, 50% or 12 companies see on-site testing as a benefit.

Companies who viewed on-site testing as an advantage most often referred to the potential for quicker turn around time. Based upon free responses given in the follow-up question 3a, companies see quicker certification as a great benefit for on-site service. It is important that this expectation be met as best as possible to fulfill the expectations of clients and potential clients. A similar trend can be seen among companies who do not see a benefit from on-site testing. Many of the companies that did not see a benefit in on-site testing indicated that time was not a factor in their operations or that they were close enough that on-site testing did not provide a large benefit for their needs.

5.5 On-Site Interest

Interest in on-site testing provides another means for establishing the need for on-site testing within industry. The scaled response in question three provides a greater indicator of the interest and potential market for on-site testing then the dichotomous question presented in question two. The answers, while scaled, are roughly similar to the responses given in question two.

Examination of the interest in on-site testing reveals a larger difference between clients and non-clients. Among clients, 18% indicated they were very interested, and 27% were interested in on-site service. For non-clients 41% indicated they were very interested, and 14% interested in on-site service. The larger percentage of non-clients interested in on-site testing can be partially attributed to the larger size of non-client companies. When examined by company size (Figures 4.4.6 thru 4.4.10) it can be seen that as company size increases so does interest in on-site service. Because non-client companies were bigger overall it is reasonable that the non-client interest is higher then that of clients.

Industry plays a similar role on interest as it did on benefit. A larger percentage of household appliance companies indicated some level of interest in on-site service, than those in the IT industry. A surprisingly large percentage, 32%, of IT equipment companies indicated that they were very uninterested in on-site service. It is again unclear why there is such a segment of the IT industry that has very little interest in on-site testing.

5.6 Potential DEMKO Usage

In total, 76% of those companies who where interested or neutrally disposed towards on-site testing, indicated they would consider using DEMKO in relation to on-site service. This represents fifty-one companies that stated they would consider using DEMKO for on-site service in the future. This demonstrates that there is a demand within industry for DEMKO's on-site testing services.

The overwhelming majority (94%) of clients would consider using DEMKO for on-site testing. Many of the comments given indicate that clients value the relationship with DEMKO and past cooperation. The relationship with Underwriters Laboratories was also mentioned by several companies as a reason for using DEMKO in relation to on-site testing.

Among non-clients, only 35% specified a potential for using DEMKO for on-site service. While this is a much lower percentage than the client affirmative response it does indicate seven companies that would be willing to use on-site service with DEMKO. The free responses from negatively responding companies demonstrate a loyalty similar to the loyalty found among clients. Several companies stated they would not consider using DEMKO in relation to on-site service because of past relations with other companies.

Examination of results by industry reveals that the loyalty found within clients and non-clients may vary based on industry. Within the household industry 100% of clients (13 companies) specified they would use DEMKO in relation to on-site service while only 25% of non-clients (3 companies) said they would consider using DEMKO. For IT companies, 88% of clients (16 companies), and 50% of non-clients (4 companies) stated they would consider using DEMKO for on-site testing. The small number of responses in each of these areas makes any conclusions skeptical but it appears that the IT industry is perhaps less loyal to a given CB and more willing to find the best service.

5.7 Fee Increase

The results achieved from question six are inconclusive. It appears that not enough was known by companies to make an informed decision on the question, as 34% of companies were unable or unwilling to give a figure for the relative amount they would spend for on-site testing. With having over a third of the companies not responding the data is unreliable and can not necessarily be trusted.

Additional confusing existed between what type of on-site testing was being referred to. No distinction was made within the question whether SMT or TMP type on-site testing was under discussion. Considering the 46% that indicated they would expect no change or a

decrease in price for on-site testing it is likely that many interpreted the question to refer to SMT type agreements when the actual focus was for TMP type agreements.

5.8 Previous On-Site Usage

Forty-four percent of those surveyed indicated they had participated in some type of previous on-site service. Theses previous agreements ranged from a one-time test of a large product to full SMT agreements on a line of products. The large percentage of past experience is potentially positive because it represents a larger market of companies that are familiar on some level with the advantages of on-site testing.

A larger percentage of non-clients have used on-site testing in the past. Sixty-two percent of non-clients (18 Companies) compared to thirty-six percent of clients (26 companies) have had a past experience with on-site testing. It is likely that this is correlated to the larger size and corresponding larger need for on-site service among larger companies.

Within industries, the household appliance industry has a greater experience with on-site testing at 62% or 21 companies. The IT industry comparatively, had only 43% or 19 companies with past experience with on-site service. The industry difference parallels the difference seen in the benefit and interest in on-site service. The greater on-site experience within the household industry can be attributed to the greater interest in on-site service overall within the household appliance industry.

It is essential to consider which CBs are providing on-site service. Based upon follow-up questions, it is evident that VDE, TÜV, NEMKO, SEMKO, Kema, and BSI have on-site testing programs of some type. Of these the largest occurrence is with VDE, where 7 companies, all non-clients within the household appliance industry, mentioned using them for on-site testing. Based on this limited data it is likely that VDE has a developed an on-site certification program.

Within the various on-site competitors, UL is present. This signals a potential market from DEMKO relations with past UL customers. It is likely that European companies would be more willing to use the European based DEMKO for gaining UL certification over working with UL in the United States to obtain access to the North American market. This follows from the earlier observations that many companies use Certifying Bodies near their location.

Among companies that had not previously used on-site service before one of the most common reasons was lack of knowledge of on-site testing. Eight companies were either interested or very interested in on-site service and were willing to use DEMKO in relation to on-site service. These companies are all current DEMKO customers. It is likely that there are other DEMKO clients not contacted for the survey that are simply not aware that DEMKO conducts on-site service and would be interested if it knew about the possibility.

5.9 Product Testing

The comparison between question eight and nine yields a general impression of the potential opportunities for field operations. Because no time period is specified the comparison can be seen as a general impression of the long-term possibilities. By examining the two questions it appears that 77% of household companies, and 67% of IT equipment companies would consider testing all types of their products. This presents a positive view for the future market of field operations. While the data given in answer to questions eight and nine can be used for general analysis of the potential long-term possibilities for on-site testing, it is more useful as a basis for working with the individual companies.

A similar analysis can be made between the answers of questions ten and eleven. These questions are better suited for short-term indications because of the two-year limitation placed in question ten. The comparison represents a more accurate representation because

the questions require a quantifiable number of products oppose to product areas as in eight and nine. Because of the more definite time frame there is also a higher percentage of uncertainty on the behalf of respondents. Any uncertainty should be cleared up with additional information regarding the services and costs of on-site service.

The majority of companies surveyed will be developing less then 10 products over the next 2 years. No significant difference can be seen between the product development of IT and household companies other than the 4% of IT companies (2 companies) that report a production of over 500 products in the next two years. It is of a greater benefit to DEMKO if relations are established with larger producing companies because greater production requires more testing.

5.10 Certification Schemes Required

It is not surprising that 90% of companies contacted to complete the survey indicated a requirement to test according to European standards as all the countries contacted were within Europe. Of greater importance is the high percentage of companies requiring UL certification. The UL certification market is one that DEMKO is uniquely qualified to fulfill. Among IT companies, 71% (17 companies) require UL certification, compared with 54% (14 companies) for household companies. This need for UL certification provides DEMKO an opportunity to provide service to a wide variety of companies.

5.11 Turn Around Time and Cost

The importance of turn around time and cost have already been established with past reports such as the "Key Account Analysis." When the average scores from this survey are translated to a 7-point scale it is possible to compare the results to the results found for similar questions within the "Key Account Analysis."

In terms of turn around time a score of 4,40 or 6,16 on a seven-point scale was obtained from the survey. This is comparable to a score of 6,58 found in the Key Account Analysis. Price or cost level was given an average of 3,82 or equivalent to a 5,35 on the seven point scale used in the "Key Account Analysis" where the same category received a rating of 5,72. The two criteria represented are of comparable value to their "Key Account Analysis" equivalents. This demonstrates that these factors remain important and that the data within the survey can be considered representative and reliable.

6.0 Discussion

6.1 Sample Population

The sample population used within the survey can be considered as representative of DEMKO's market. Indicators such as geographic distribution and comparisons to the "Key Account Analysis" suggest that the survey does in fact accurately select from DEMKO's target clientele. As the market is subdivided, the reliability of information in this study may become less representative.

The percentage of Danish companies (58%) closely matches the true percentage of Danish companies served by DEMKO (55%). Additionally, the ratings given by companies for the importance of turnaround time and cost closely aligned with the responses given in the "Key Account Analysis." These indicators demonstrate that the results are representative of the actual market.

Among DEMKO's current clients the survey obtained more responses from Danish clients than foreign clients. It is unclear based upon the information collected if this will significantly effect how the results will apply to foreign clientele. Based on the responses by foreign clients and non-clients it is unlikely that the higher geographic concentration of Danish based companies amongst the clients will result in significant variation of the data because of the similarity of responses.

Within non-clients there is a geographic bias towards German and British based respondents. This bias is not likely to cause a significant variation based on a large segment of foreign clientele based in these two countries.[62] More significant for the purposes of analysis and applicability towards the general market is the bias towards larger non-client companies that in many cases represent branch offices of larger multi-national corporations. The data demonstrates the noticeably larger size of many of the non-client respondents and

some of the side effects of the concentration such as the greater availability of testing equipment and greater interest.

6.2 Interest Level

While the data supports a conclusion that there is interest in on-site testing there is no significant difference placed between the interest levels of different portions of the market such as divisions based on industry. The difficulties of breaking down the analysis to far have already been discussed and relate directly to analyzing specific areas of interest for field operations. Some general areas of higher interest can however be identified. The difference in these sectors is not however significant enough to warrant a focus in those areas.

Based on industry, differences within interest levels did arise. A larger portion of household appliance companies (61%) indicated interest in on-site testing than the IT companies (42%). The difference was not significant enough to justify a specialization at DEMKO based on that difference. Additionally, each industry presents a significant opportunity for expansion of field operations that it appears unnecessary to extensively examine the minor differences in interest based on industry and other classification information.

6.3 Cost and SMT/TMP Testing

The results from question six concerning the percentage fee increase that companies would be willing to spend were inconclusive towards their originally intended purpose. Aside from the large portion of the population that was unable to answer (34%), an even larger percentage (46%) indicated a desire to pay the same or less for on-site service. These responses indicate a potential difference in interpretations of on-site testing.

The differences between SMT and TMP agreements were only briefly mentioned in the survey introduction. The terms SMT and TMP were never mentioned during the survey. The reasoning for not elaborating on SMT and TMP agreements was to avoid confusion by presenting too much new information to companies. Unfortunately, it may be that not enough information was given to properly differentiate between these agreements and properly understand the focus of questions such as question six.

The effects of not addressing the differences between SMT and TMP agreements were relatively small. Aside from the confusion with question six the largest effect of not addressing SMT and TMP differences occurs in differentiating the need of SMT and TMP type services. The only indicator of potential necessary agreements lies in question one relating to the amount of testing equipment available. Overall, this problem is not significant because facilities must be checked in greater depth prior to the signing of any agreement.

6.4 Turn Around Time

Question thirteen indicated the importance of turn around time for respondents. The results indicated a high level of importance placed on turn around time, consistent with the "Key Account Analysis." Additionally, the information in this survey presented that the importance of turn around time, as well as cost were relatively consistent throughout different industry types. Based upon comments and observations with key personnel at DEMKO there may be a more significant difference between what an acceptable turn around time is.

While no definite data is available, several companies in the IT and other industries made references to what is an acceptable time period for turn around time. Kenwood, a household appliance company indicated it was satisfied with the four-week turn around time it was receiving with NEMKO. Alternatively, several IT companies indicated that turn

around time was important because a week delay could be detrimental to the marketing of their product.

Understanding what DEMKO's clients consider to be an acceptable turn around time will significantly benefit the service that DEMKO can provide these companies. Knowing what the client considers acceptable will avoid misunderstanding based on different perceptions of acceptable turn around time. As no conclusions can be made in this area based on this analysis it is advisable that future market studies consider this area of study.

6.5 EMC Testing

Another area for future consideration is the usage of on-site testing for EMC compliance for companies with the IT industry. At least four companies within the IT industry mentioned an interest in receiving EMC testing on-site. In several of these case the availability of on-site EMC testing would be the significant factor in determining whether or not to use on-site testing with DEMKO.

This is an area that must be addressed from a technical viewpoint. Full EMC testing of products on-site would be difficult based on the extensive equipment necessary for such testing. Except in cases where companies have EMC testing facilities on site it is unlikely that DEMKO would be able to justify the transport of all EMC testing equipment to the manufacturer's location. It may be possible however to perform some limited tests that would be representative of how the product would perform in DEMKO's EMC testing facilities[63]. While the preliminary testing would not be sufficient for certification it could still catch errors prior to testing at DEMKO.

7.0 Conclusions

The results of the survey present an encouraging view of the future of the Field Operations Department at DEMKO. These findings confirmed that the market for field operations exists and found that the market is larger than previously thought[62]. Additionally promising for DEMKO is the willingness of half of the companies to consider using DEMKO for on-site service in the future. Lastly, survey results determined some important information and focus areas for future field operations initiatives.

It is clear that a market exists for field operations within all segments of DEMKO's clients and potential clients. Overall, a total of forty-seven percent of respondents indicated they were interested or very interested in on-site service. In some categories, such as with large companies (1000 or more employees) this percentage raises as high as seventy-one percent. Even among categories with a smaller percentage of interested companies, the level of interest is high enough to indicate a potential for future growth.

While the market looks favorably on the concept of field operations, it is also positive towards the use of DEMKO for to meet its on-site testing needs. Nearly all interested clients and over a quarter of non-clients indicated they would consider using DEMKO for on-site certification of their products. In total, this data represents fifty-one companies, or half of the market, that are interested in considering using DEMKO for on-site testing.

The most commonly mentioned reason for not using on-site testing, among companies who had never used on-site testing before, was a lack of knowledge of the existence of on-site testing. Nearly a fifth of all companies surveyed indicated they did not know that on-site service was offered. Over forty percent of these companies indicated an interest in on-site testing after hearing about it. These companies represent a significant untapped market of companies that could use on-site testing but have not because they have never been informed that such a program existed.

Companies interested in field operations require certification of products on a variety of schemes. Ninety percent of interested companies require certification based on European certification schemes. Sixty percent require UL certification, and fifty-seven percent require international certification. Additionally, fifty-five percent require UL certification in addition to either European or international certification. These figures indicate a large need for a diversity of certification within on-site testing.

All indications depict a wide horizon for the future of the DEMKO's Field Operations Department. The market for field operations exists and then any previous expectations.[62] The demand for using the Field Operations Department at DEMKO is very high. Companies who are interested using on-site service are interested in a variety of certification schemes including UL certification, which DEMKO is in a unique position within Europe to provide.

8.0 Recommendations

Based upon the information collected during the survey, it is evident that there is a great potential for the future expansion of DEMKO's Field Operations Department. In order to rise to this prospective market the department must consider expansion into the areas of highest probability as demonstrated by the results of the survey. Accomplishing this expansion will require expanding the Field Operation's clientele based upon current capabilities and expanding the department to meet full future demands of the market.

The initial priority of expansion involves the contacting of interested survey participants. These favorable respondents represent a large initial basis for expansion of current operations. The needs and interest of these specific companies are known and can be found within the Company Reports (Appendix E). Contacting companies who indicated interest during the survey should yield a high percentage of future field operations agreements.

In the longer term, companies, both clients and non-clients, must be made aware of the services that DEMKO can offer. Without knowledge of on-site services, companies will never use the services. DEMKO must provide potential customers with enough information to make an educated decision regarding the usage of on-site service and how DEMKO can provide these services. Specifically, companies must be able to understand the potential benefits and differences between SMT and TMP agreements as well as UL's comparable Client and Witness Test Data Programs for North American markets.

To meet the needs of its clients in the present and future, the Field Operations Department must ensure that it maintains the equipment and personnel necessary to fulfill the market demand. Additionally, it is essential that personnel and equipment allow for European and North American testing. The demand for on-site UL certification is high, and DEMKO's relation to UL places it in an excellent position to fulfill this need. It is crucial that

investments in the staff and equipment of the Field Operations Department allow for comprehensive development of this sizeable market.

Indications show that the future market of on-site service provided by the DEMKO Field Operations Department are sufficiently large for expansion in future years. In the short-term, the survey respondents provide an excellent starting focus for expanding field operations clientele. On a long-term basis, a combined program of providing information to companies and developing the capabilities of the department will enable the expansion of the department into the future.

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APPENDIX A

Operation of Supervised Manufacturer's Testing, SMT
CCA 231-1, August 1995

ARKIV

OPERATION OF SUPERVISED MANUFACTURER'S TESTING, SMT

(See also CCA-205, Former OD 3-4)

(Decided by the CCA Group in Athens in April 1988.
Revised by the CCA Group in Arnhem in September 1988.
Revised by the CCA Group in Dublin in April 1991.)

The form "Client to SMT" modified to distinguish the date of initial contract from the latest revision (page 6/7), in August 1995.

OPERATION OF SUPERVISED MANUFACTURER'S TESTING, SMT

SMT is an alternative to 3rd party testing and a development of the CCA. The rules and decisions of the CCA therefore apply to SMT as far as applicable. As the CCA is only applicable to manufacturers resident in the CENELEC countries (Article 1.2 of the CCA), the same rule applies to the SMT within CCA.

The basic rules for SMT are contained in Addendum 2 to the CCA, signed in the autumn of 1987. This as well as some practical provisions for the operation of SMT are contained in Permanent Document MC-18, issued as CCA-205 (Former OD 3-4).

The NCBs applying SMT should keep the Chairman of the CCA Group informed, according to Article 10 of the Addendum 2 to the CCA and clause 5 of CCA-205, of contracts entered with manufacturers. It is equally important to inform about contracts withdrawn. It is the duty of the Chairman to keep the Member NCBs currently informed about contracts in force. Rules for reports to the Chairman of the CCA Group are given in Appendix 1 to this OD.

The following practical hints and comments for the operation of SMT may be helpful for the NCBs involved.

- It is important that the NCB is ready to send the inspector to the manufacturer at short notice and that the arrangements are agreed with the manufacturer. It is also necessary that the manufacturer provides all necessary information for the inspector to prepare the inspection.

- It is assumed that it is normally most practical for a manufacturer to make contract with the NCB in his own country. When this NCB is overloaded or for geographical reasons, it may sometimes be more practical for him to make contract with another NCB. This possibility must not be used as a possibility a manufacturer to play one NCB against another. The consultations mentioned in Article 11 of Addendum 2 to the CCA may be quite informal, but the results of the consultations should be confirmed in writing. This confirmation should be included in the report to the Chairman of the CCA Group in addition to what is said in Appendix 1 to this OD.

- The contents of the "formal agreement" mentioned in Article 9 of Addendum 2, here called "contract" is implicit in available documents. Each NCB may use its form of contract. As an assistance for the NCBs, Guidelines for the contents of such a contract are given in Appendix 2 to this OD.

Note 1
At its meeting in Brugge in September 1989 the CCA Group decided that ISO/IEC Guides 25 and 38 as specified in clause 1 in Addendum 2 to the CCA shall in practice be replaced by EN 45001.

Note 2
For definition of manufacturer also see CCA-223-7 (Former OD 3-7).

Rules for reports about SMT

Each NCB shall report to the Chairman of the CCA Group clients who have been approved by the NCB and signed a contract for SMT. The Chairman of the CCA will keep a register containing SMT-clients for all NCBs. (See Article 10 of Addendum 2 to the CCA and clause 5 of CCA-205)

The report from the NCB to the Chairman of the CCA Group shall contain information as follows.

1 Standard contract

When the first SMT-client is reported a copy of the standard contract (the formal agreement according to Article 9 of Addendum 2 to the CCA) which is used between the NCB and its client shall be sent by the NCB to the Chairman of the CCA Group. (The copy shall be a sample without the specific conditions from any client.) When the standard contract is changed, a copy of the new version shall be sent to the Chairman of the CCA Group.

2 Report on each SMT client

For each client/each laboratory who has been approved and has signed the contract, the following information shall be reported by the NCB to the CCA Chairman :

2.1 Date of the contract
2.2 Client's name and address of the headquarter
2.3 Name and address of each involved manufacturing factory
2.4 Name and address of each approved laboratory
2.5 Products covered by the contract

For the reports, the enclosed form shall be used.

Changes in the content of the contract referring to the above mentioned information shall be reported.

3 A Operation

The NCB shall keep records containing information as follows.

3.1 The intended minimum amount of supervision expressed as clauses in corresponding standards
3.2 Dates and hours of performed supervision and which clauses in corresponding standards have been supervised.

Appendix 2

GUIDELINES for the

CONTENTS OF THE FORMAL AGREEMENT BETWEEN MANUFACTURER AND NATIONAL CERTIFICATION BODY ABOUT SMT *)

1 The contract should cover the SMT rules according to Addendum 2, to be part of the contract.

2 The applicable national rules of the NCB should be included or referred to in the contract.

3 The manufacturer shall be well defined and the product types and categories shall be clearly specified. This implies that the contract shall be updated every time changes occur in these respects.

4 The manufacturer shall inform the NCB about changes in the facilities covered by the contract.

5 The NCB shall agree to send inspectors at short notice to inspect tests on the manufacturer's site.

6 The manufacturer shall give access for duly accredited inspectors from the NCB to the premises covered by the contract at any time during working hours without appointment and give all information needed for the inspector to prepare the inspection.

The NCB shall also be entitled to receive test samples free of charge for following up and comparison purposes.

7 The NCB shall keep the manufacturer informed about decisions and recommendations relevant to the operations covered by the contract. The manufacturer should keep this information filed and follow it in the operations covered by the contract. However, the manufacturer himself has the responsibility to follow and to keep himself well informed of the development of used standards.

8 The operations according to the contract shall be covered by the same secrecy rules as the other operations of the NCB. This secrecy shall be observed also after termination of the contract.

9 It shall be made clear that the contract and its application does in no way exempt the manufacturer from the full and final responsibility for the products which are marketed after application of SMT.

10 It shall be stated that the manufacturer or client may not use SMT for promotional or advertising purposes according to Article 8 in Addendum 2.

11 There should be a termination clause in the contract covering both the normal routine with a stipulated time for notice by either party and the emergency measures which can be necessary if the manufacturer does not fulfil the basic conditions (immediate cancelling).

*) SEMKO's contract form is available on request.

(Report to the Chairman of the CCA Group)

NCB: _____ Report No.: _____

Address: _____ Date: 19 ___ - ___ - ___

Country: _____ Name: _____

Date of initial contract : _____

Sign: _____

Latest revision : _____

Client, name and address of headquarter: _____

_____

_____

_____

Approved laboratories name and address: _____

_____

_____

_____

Manufacturing factories, name and address: _____

_____

_____

Products covered by the contract: _____

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APPENDIX B

Operation of Supervised Manufacturer's Testing (SMT)
CCA 205, May 1998

CCA GROUP PERMANENT DOCUMENT CCA-205

May 1988

OPERATION OF THE SUPERVISED MANUFACTURER'S TESTING (SMT) SCHEME

Permanent Document MC-18 1988

(see also OD 11)

MARKS COMMITTEE PERMANENT DOCUMENT, MC-18

OPERATION OF THE SUPERVISED MANUFACTURER'S TESTING (SMT) SCHEME

In implementing the scheme described in Addendum No.2, the following provisions will apply:-

1. Categories of equipment to be tested via this route will be identified by the relevant particular standard.

2. The ISO/IEC Guides referred to in Clause 1 of Addendum No.2 are Guide 25 - 1982 and Guide 38 - 1983.

3. A manufacturer wishing to use SMT should make application in accordance with the procedures of the Certification Body.

4. Information shall be provided to the Certification Body for evaluation in accordance with the Annexe to Guide 38. A formal assessment of the test facilities will be carried out by the Certification Body.

5. A Certification Body on agreeing to a manufacturer to use SMT, will advise the Chairman of the CCA Group including those categories of equipment which have been authorized.

6. Test Report forms and Reference Numbers will be provided by the Certification Body.

7. When an NTR is based on SMT the reference "SMT" will be included as "Additional Information". Statistics on the number of Certifications granted via SMT will be provided by the Certification Bodies to the Chairman of the CCA Group on request.

ADDENDUM NO. 2 TO THE CENELEC CERTIFICATION AGREEMENT

Final text adopted by the MC 1987-03-10

SUPERVISED MANUFACTURER'S TESTING

The Certification Bodies listed in Annexe A to this Addendum have agreed to operate a system of Supervised Manufacturer's Testing as an alternative route to obtaining a Notification of Test Results. The criteria to be followed are listed below:

1. There shall be evidence that the Certification Body has determined that the manufacturer's test laboratories be established and operated to its satisfaction in accordance with the appropriate provisions of ISO/IEC Guides 25 and 38. There shall be an ongoing verification of compliance with these requirements as under Paragraph 8.7 of Guide 38.

2. Test results obtained must be from a sample representative of production.

3. Upon initiation of Supervised Manufacturer's Testing tests shall be witnessed. There shall be a random witnessing of testing by the Certification Body although the Certification Body may specify certain tests which must be witnessed.

4. The Certification Body shall have the right to conduct any test prior to issuing a Notification of Test Results.

5. The Certification Body shall only allow Supervised Manufacturer's Testing for specific categories of equipment for which the manufacturer has a proven capability.

6. A Notification of Test Results, which would be issued by the Certification Body, obtained by Supervised Manufacturer's Testing will have the same status as one obtained by third-party testing.

7. The agreement for the manufacturer to use Supervised Manufacturer's Testing may be withdrawn or suspended by the Certification Body at any time for non-compliance with the rules of the scheme. The national appeals procedure shall, if necessary, be used.

8. A manufacturer permitted to use Supervised Manufacturer's Testing shall not use this fact for promotional or advertising purposes.

9. The operation of the scheme shall be subject of a formal agreement between the Certification Body and the manufacturer.

ANNEX TO THE ADDENDUM 2
TO THE ~~CENELEC CERTIFICATION~~
AGREEMENT (CCA) AS OF 16TH
~~SEPTEMBER~~ 1987

LIST OF CERTIFYING/APPROVAL ORGANIZATIONS ADHERING TO THIS ADDENDUM 2

Country	Certifying/Approval Organization	Abreviation	Signature and date
AUSTRIA	Oesterreichischer Verband für Elektrotechnik Eschenbachgasse 9 A-1010 Wien	ÖVE	15.09.1988
BELGIUM	Comité Electro-technique Belge 3 Galerie Ravenstein B-1000 Brussels	CEB	17.9.87
DENMARK	Danmarks Elektriske Materiel-Kontrol Lyskaer 8 DK-2730 Herlev	DEMKO	17.9.87
FINLAND	Electrical Inspectorate P.O. Box 21 SF-00211 Helsinki 21	SETI	1987-09-17
FRANCE	Union Technique de l'Electricité Place des Etats-Unis 12 F-75783 Paris Cedex 16	UTE	17 sept 1987
GERMANY	VDE-Prüfstelle Verband Deutscher Elektrotechniker Merianstrasse 28 D-6050 Offenbach/Main	VDE	17.9.87
GREECE	Hellenic Organization for Standardization Didotou 15 GR - Athens 144	ELOT	1988.04.15
IRELAND	National Standards Authority of Ireland Glasnevin IRL-Dublin 9	NSAI	29-10-87
ITALY	Istituto Italiano del Marchio di Qualita Via Quintiliano 43 I-20138 Milano	IMQ	12.5.88

APPENDIX C

CENELEC Certification Agreement (CCA)
CCA 210, March 1996

CENELEC CERTIFICATION AGREEMENT (CCA)

as of 11 September 1973 and revised 29 March 1983
completed with
its Addendum 1 dated July 1984,
its Addendum 2 dated March 1987,
its Addendum 3 dated September 1989,
and its Addendum 4 dated March 1995

Contents

NOTE: This issue (March 1996) of the CENELEC Certification Agreement and its addenda, constitutes the updated version of the former CENELEC Memorandum n° 13, taking into account the most recent developments in terms of the establishment of ELSECOM and the LVE-AC, the adoption of addendum 4 to the CCA and the acceptance of new signatories. CENELEC Memorandum n° 13 has been withdrawn in 1996 by unanimous decision of the 36th CENELEC General Assembly.

Part A: Agreement and its addenda

CENELEC CERTIFICATION AGREEMENT (CCA)
as of 11 September 1973 and revised 29 March 1983

Introduction

This version replaces all previous versions of the CCA. The modifications should facilitate a broader application of the Agreement both by eliminating unnecessary repetition of tests for a given product and by reducing the time for granting national marks. The revised text should also facilitate the general understanding of the implications of the Agreement.

The other CENELEC certification agreements in existence or under discussion will not be affected by this Agreement. This applies in particular to the HAR marking scheme and the CECC.

1 General

1.1 On the basis of Article 3 of the "Memorandum and Articles of Association" of CENELEC, the national bodies issuing marks of conformity (hereinafter called "bodies") listed in the annex have agreed to the following provisions.

The Agreement shall facilitate trade between CENELEC member countries and in particular lead to a satisfactory application of the relevant stipulations of the Low Voltage Directive of the European Communities without unnecessary repetition of tests. It shall also facilitate the practical application of the relevant agreements between the governments of the EFTA countries, and between the EFTA countries and the European Union.

Accordingly the manufacturer will have the choice between two ways to apply for a national mark of conformity

- either the usual way, all necessary tests being carried out
- or to submit a Notification (see clause 2.1) indicating the satisfactory results of the tests performed by another body.

1.8 The bodies declare that they will assist each other in checking that correct use is made of their marks.

1.9 Problems arising from the application of this Agreement will be referred for advice to the Low Voltage Electrical Equipment Advisory Committee (LVE-AC) which will liaise with the Technical Committee of CENELEC where relevant.

1.10 The provisions of this Agreement do not prejudice the operation of other schemes to which any of the bodies are participants.

1.11 Manufacturers and other groups concerned will be regularly informed about the operation of this Agreement in the CENELEC publications.

2 Type testing

2.1 This Agreement will permit manufacturers to use the "Notification of Test Results", hereinafter called Notification, granted by any of the bodies. The Notification notifies the results contained in the test report and is therefore mutually recognized between the bodies.

2.2 When submitting a type of electrical equipment to body A, the manufacturer may request body A to take into account deviations recognized under the CENELEC harmonization procedures as being necessary for granting mark B in addition to the requirements necessary for granting mark A.

2.3 When for a given product manufacturer A applies to body B for the right to use mark B on the product, he submits the following:

a) an application letter or form where the product is defined in an unambiguous way

b) a specimen of the product

c) the "Notification of Test Results" from body A

d) an Identity Declaration

e) a copy of test report from body A

Note: Some bodies do not require items b) and e) above.

2.4 On receipt of the items according to clause 2.3, body B

a) examines the Notification, the test report, the Identity Declaration and the specimen to the extent considered necessary for the identification of the product and for recognition of the Notification (see 1.5) ;

Addendum 1 to the CENELEC Certification Agreement (July 1984)

1. Any organization, who has not been a signatory to the CENELEC Certification Agreement of 1973, wishing to sign the 1983 agreement must comply with the conditions on competence and integrity that apply at the time of signing.
2. The signatories shall form a Group to deal with matters regarding the operation of the CENELEC Certification Agreement.
3. The signatories shall operate among themselves to maintain mutual confidence, such as mutual assessment and comparative tests, according to guidelines given in recognized international documents and taking advice on matters of principle from the Low Voltage Electrical Equipment Advisory Committee (LVE-AC). These activities shall be planned and followed up by the Group.
4. Problems of identifying and dealing with defective applications shall be dealt with according to procedures approved by the LVE-AC.
5. The operation of the 1983 agreement can be suspended for a stated period for a signatory who violates the CENELEC Certification Agreement or conducts his part of the operations in an unsatisfactory way. Such a suspension shall be agreed by all the other signatories and formally recorded.
6. The obligation to grant its own mark in accordance with items 2.4 and 2.5 of the CCA does not restrict the right of the owner of the mark to make investigations in case of doubt. This will not involve charges to the applicant and will not delay the initial procedure for granting the mark. However, if the investigation leads to a negative result, the case will be dealt with according to procedures agreed upon by the LVE-AC.

Addendum 2 to the CENELEC Certification Agreement (March 1987)

Supervised Manufacturer's Testing

The Certification Bodies listed in Annex A to this Addendum have agreed to operate a system of Supervised Manufacturer's Testing as an alternative route to obtaining a Notification of Test Results. The criteria to be followed are listed below:

1. There shall be evidence that the Certification Body has determined that the manufacturer's test laboratories be established and operated to its satisfaction in accordance with the appropriate provisions of ISO/IEC Guides 25 and 38. There shall be an ongoing verification of compliance with these requirements as under Paragraph 8.7 of Guide 38.
2. Test results obtained must be from a sample representative of production.
3. Upon initiation of Supervised Manufacturer's Testing tests shall be witnessed. There shall be a random witnessing of testing by the Certification Body although the Certification Body may specify certain tests which must be witnessed.
4. The Certification Body shall have the right to conduct any test prior to issuing a Notification of Test Results.
5. The Certification Body shall only allow Supervised Manufacturer's Testing for specific categories of equipment for which the manufacturer has a proven capability.
6. A Notification of Test Results, which would be issued by the Certification Body, obtained by Supervised Manufacturer's Testing will have the same status as one obtained by third-party testing.
7. The agreement for the manufacturer to use Supervised Manufacturer's Testing may be withdrawn or suspended by the Certification Body at any time for non-compliance with the rules of the scheme. The national appeals procedure shall, if necessary, be used.

Addendum 3 to the CENELEC Certification Agreement (September 1989)

Insurance

1. All bodies operating this Agreement shall have in effect insurance cover provided by an insurance company of good repute and adequate financial standing which provides an indemnity to them in respect of claims made against them arising out of or, in any way, related to their acts or omissions occurring whilst operating the Agreement. In particular the following points should be covered:

   1.1 Mistakes committed in judging a test report which is in itself correct.

   1.2 Mistakes which could be involved in a test report involving the following kinds of errors:

      1.2.1 Mistakes committed by employees in their own organisation.

      1.2.2 Mistakes committed in another laboratory employed by the policy holder.

2. The insurance cover shall be for an amount not less than 2.000.000 ECU total aggregate indemnity in any period of one year or its equivalent and the indemnity shall extend to claims made in all countries having bodies operating this Agreement.

3. Each member body able to sign the Addendum will submit to the Chairman of the CCA Group a certificate, in the format of the specimen certificate appended to this addendum, confirming that insurance cover is held in accordance with the requirements of the Addendum. If a body A fails to meet the requirements of the addendum then a body B shall not be obliged to operate this agreement insofar as it concerns a Notification of Test Results issued by that body A.

   Note: Where such indemnity is provided to a body by its Government then satisfactory evidence of its existence should be provided by a Government source.

Jurisdiction

1. In the event of legal proceedings being issued against body B at any time in the courts of any of the countries of the signatory bodies to this addendum, body A agrees that it will submit to the jurisdiction of the courts of that country.

Addendum 4 to the CENELEC Certification Agreement (March 1995)

All signatories agree not to introduce new differences in the meaning of their marks for which CCA applies, with respect to the situation shown in the last issue of OD CCA-230 (former OD-10), unless immediately advised to the CCA Group for changes to align with other marks as defined in OD CCA-230 or, if it is a new requirement, approved by the CCA Group and brought to the knowledge of LVE-AC.

Part B: Signature lists

List of bodies adhering to the CENELEC-Certification Agreement (CCA)

Country	Body	Abbrevation	Signature and date
AUSTRIA	Österreichischer Verband für Elektrotechnik Eschenbachgasse 9 A - 1010 Wien	ÖVE	1983-4-17
BELGIUM	Le Comité Electrotechnique Belge 3 Galerie Ravenstein B - 1000 Brussels	CEB	19.7.84
CZECH REPUBLIC	Electrotechnical Testing Institute Pod Lisem 129 CZ - 17102 Praha	EZU	12.5.96
DENMARK	Danmarks Elektriske Materiel-Kontrol Lyskaer 8 DK - 2730 Herlev	DEMKO	1983-03-29
FINLAND	Electrical Inspectorate P.O. Box 21 SF - 00211 Helsinki 21	SETI	1983-03-29
FRANCE	Union Technique de l'Electricité Place des Etats-Unis 12 F - 75783 Paris Cedex 16	UTE	1983-03-29
GERMANY	VDE-Prüfstelle Verband Deutscher Elektro-techniker Merianstraße 28 D - 6050 Offenbach/Main	VDE	1983-03-29
GREECE	Hellenic Organization for Standardization Didotou 15 GR - Athens 144	ELOT	1983.04.15
HUNGARY	Hungarian Institute for Testing and Certification of Electrical Equipment Vaci ut 48 a/b H - 1132 Budapest	MEEI	94-03-10

List of bodies adhering to the CENELEC-Certification Agreement (CCA) (end)

Country	Body	Abbreviation	Signature and date
SPAIN	Asociación Electroctécnica y Electrónica Española (*) Avenida del Brasil 7 E - 28020 Madrid	AEE	1986-04-04
SPAIN	AENOR Fernandez de la Hoz 52 E - 28010 Madrid	AENOR	1991-10-10
SWEDEN	Svenska Elektriska Materielkontrollanstalten Box 1103 S - 16312 Spånga-Stockholm	SEMKO	1993-03-29
SWITZERLAND	Schweizerischer Elektro-technischer Verein Postfach CH - 8034 Zurich	SEV	1985-04-06
UNITED KINGDOM	BSI Quality Assurance Services Linford Wood, GB-Milton Keynes MK14 6LE	BSI	23 August 84
	British Electrotechnical Approvals Board Mark House, The Green 9/11 Queens Road Hersham, Walton-on-Thames GB - Surrey KT12 5NA	BEAB	18 Oct 1985
	ASTA Certification Services Prudential Chambers 23/24 Market Place, Rugby, GB-Warwickshire CV 21 3DU	ASTA	27 November 1991

(*) AEE withdrew its membership as certification body from 1 January 1993 onwards

List of bodies adhering to Addendum 1 to the CCA (continued)

Country	Body	Abbreviation	Signature and date
IRELAND	Institute for Industrial Research and Standards Ballymun Road IRL - Dublin 9	IIRS	4.10.84.
ITALY	Istituto Italiano del Marchio di Qualità Via Quintiliano 43 I - 20138 Milano	IMQ	4-10-84
LUXEMBOURG	SEE/SNCT-H bp 23 L - 5201 Sandweiler	SEE	1.10.1991
NETHERLANDS	Naamloze Vennootschap tot Keuring van Elektrotechnische Materialen Utrechtseweg 310 Postbus 9035 NL - 6800 ET Arnhem	KEMA	19-7-94
NORWAY	Norges Elektriske Materiellkontrol Postboks 288 N - Blindern Oslo 3	NEMKO	1994-10-04
PORTUGAL	Instituto Português da Qualidade Rua José Estêvão, 83 A P - 1199 Lisboa Codex	IPQ	89.12.06
SLOVAKIA	Electrotechnical Research and Design Institute (EVPU) a.s. Trencianska 19 SK - 01851 Nova Dubnica	EVPU	10. 10. 1995
SLOVENIA	Slovenian Institute of Quality and Metrology Trzaska cesta 2 SI - 1000 Ljubljana	SIQ	10. 10. 1995

List of bodies adhering to Addendum 2 to the CCA

Country	Body	Abbreviation	Signature and date
AUSTRIA	Österreichischer Verband für Elektrotechnik Eschenbachgasse 9 A - 1010 Wien	ÖVE	15. 04. 1997
BELGIUM	Comité Electrotechnique Belge 3 Galerie Ravenstein B - 1000 Brussels	CEB	19.9.97
CZECH REPUBLIC	Electrotechnical Testing Institute Pod Lisem 129 CZ - 17102 Praha	EZU	12.3.96
DENMARK	Danmarks Elektriske Materiel-Kontrol Lyskaer 8 DK - 2730 Herlev	DEMKO	17.9.97
FINLAND	Electrical Inspectorate P.O. Box 21 SF - 00211 Helsinki 21	SETI	1997-09-17
FRANCE	Union Technique de l'Electricité Place des Etats-Unis 12 F - 75783 Paris Cedex 16	UTE	17 sept 1997
GERMANY	VDE-Prüfstelle Verband Deutscher Elektrotechniker Merianstraße 28 D - 6050 Offenbach/Main	VDE	17. 9. 97
GREECE	Hellenic Organization for Standardization Didotou 15 GR - Athens 144	ELOT	1998.04.15
HUNGARY	Hungarian Institute for Testing and Certification of Electrical Equipment Vaci ut 48 a/b H - 1132 Budapest	MEEI	94-03-10

List of bodies adhering to Addendum 2 to the CCA (end)

Country	Body	Abbreviation	Signature and date
SPAIN	Asociación Electroctécnica y Electrónica Española (*) Avenida del Brasil 7 E - 28020 Madrid	AEE	8-10-87.-
SPAIN	AENOR Fernandez de la Hoz 52 E - 28010 Madrid	AENOR	1991-10-10
SWEDEN	Svenska Elektriska Materielkontrollanstalten AB Box 1103 S - 16312 Spånga-Stockholm	SEMKO	17. 9. 1987
SWITZERLAND	Schweizerischer Elektro-technischer Verein Postfach CH - 8034 Zurich	SEV	17-09-1987
UNITED KINGDOM	BSI Certification and Assessment Service Linford Wood, Milton Keynes GB - MK 146 LL	BSI	9 Oct 87
	British Electrotechnical Approvals Board Mark House, The Green 9/11 Queen's Road Hersham, Walton-on-Thames GB - Surrey KT12 5NA	BEAB	17/9/87
	ASTA Certification Services Prudential Chambers 23/24 Market Place, Rugby, GB-Warwickshire CV 21 3DU	ASTA	27 November 1991

(*) AEE withdrew its membership as certification body from 1 January 1993 onwards

List of bodies adhering to Addendum 3 to the CCA (continued)

Country	Body	Abbreviation	Signature and date
IRELAND	National Standards Authority of Ireland Glasnevin IRL - Dublin 9	NSAI	1990-05-15
ITALY	Istituto Italiano del Marchio di Qualità Via Quintiliano 43 I - 20138 Milano	IMQ	22 Sept. 1989
LUXEMBOURG	SEE/SNCT-H bp 23 L - 5201 Sandweiler	SEE	1.10.1991
NETHERLANDS	Naamloze Vennootschap tot Keuring van Elektrotechnische Materialen Utrechtseweg 310 Postbus 9035 NL - 6800 ET Arnhem	KEMA	J.H. Blom 19 maart 1990
NORWAY	Norges Elektriske Materiellkontrol Postboks 73, Blindern N - 0314 Oslo 3	NEMKO	89.09.22
PORTUGAL	Instituto Português da Qualidade Rua José Estêvão, 83 A P - 1199 Lisboa Codex	IPQ	89.12.06
SLOVAKIA	Electrotechnical Research and Design Institute (EVPU) a.s. Trencianska 19 SK - 01851 Nova Dubnica	EVPU	10.10.1991
SLOVENIA	Slovenian Institute of Quality and Metrology Trzaska cesta 2 SI - 1000 Ljubljana	SIQ	1996-03-12

List of bodies adhering to Addendum 4 to the CCA

Country	Body	Abbr.	Mark for which the engagement of this addendum applies	Signature and date
AUSTRIA	Österreichischer Verband für Elektrotechnik Eschenbachgasse 9 A - 1010 Wien	ÖVE	ÖVE	[illegible] 20. 3. 1995
BELGIUM	CEBEC Registered Quality Ave Fr Van Kalken 9A, Bte 1 B - 1070 Brussels	CRQ	CEBEC	[illegible] R. MAQUESTIAU *Directeur* 17 oct 95
CZECH REPUBLIC	Electrotechnical Testing Institute Pod Lisem 129 CZ - 17102 Praha	EZU		
DENMARK	Danmarks Elektriske Materiel-Kontrol Lyskaer 8 DK - 2730 Herlev	DEMKO	D	[illegible] 24/3 - 95.
FINLAND	FIMKO P.O. Box 21 SF - 00210 Helsinki	FIMKO	FI	[illegible] 20 3. 1995
FRANCE	Union Technique de l'Electricité Immeuble Lavoisier F - 92052 Paris La Défense Cédex	UTE	NF. Electricité NF- Luminaires NF- USE Appareillage NF. Motocompresseurs	[illegible] 20.3.95
GERMANY	VDE-Institut Merianstraße 28 D - 63069 Offenbach/Main	VDE	VDE	[illegible] 1995-03-21
GREECE	Hellenic Organization for Standardization Acharnon Street 313 GR - 111 45 Athens	ELOT	ELOT	[illegible] 1995-03-20

List of bodies adhering to Addendum 4 to the CCA (End)

Country	Body	Abbr.	Mark for which the engagement of this addendum applies	Signature and date
LOVENIA	Slovenian Institute of Quality and Metrology Trzaska cesta 2 SI - 1000 Ljubljana	SIQ		
AIN	Asociación Española de Normalizacion y Certificación Fernandez de la Hoz 52 E - 28010 Madrid	AENOR		
WEDEN	Svenska Elektriska Materielkontrollanstalten AB Box 1103 S - 164 22 Kista/Stockholm	SEMKO		1995-03-20
WITZERLAND	Schweizerischer Elektro-technischer Verein Postfach CH - 8320 Fehraltorf	SEV		95-03-20
NITED IGDOM	BSI Product Certification P.O. Box 375 Milton Keynes GB - MK14 6LL	BSI		95-03-20
	British Electrotechnical Approvals Board Mark House, The Green 9/11 Queen's Road, Hersham GB - Surrey KT12 5NA	BEAB	BEAB Approved	95-03-20
	ASTA Certification Services ASTA House, Chestnut Field GB - Rugby CV 21 2 TL Warwickshire	ASTA		95-03-20

APPENDIX D

DEMKO's Key Account Analysis
June/August 1998

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APPENDIX E

Script of Phone Survey

Good (morning / afternoon / evening),

I'm calling on behalf of DEMKO, the Danish subsidiary of Underwriters Laboratory. Could I please speak with ___ ___ ____ ? (name provided through listings) (wait until transferred)

Good (morning / afternoon / evening), my name is ___ ___. I am an American university student working with DEMKO, the Danish subsidiary of Underwriters Laboratory. This project is concerned with the future expansion of its field operations department.

Would it be possible to ask you some questions, it will take approximately 10 minutes?

No - When would be a better time to call you back?
Thank You!

Field operation is the testing and certification of your products outside of DEMKO's testing facilities for North America and European markets. Such testing and certification of your products can be completed at your location. By testing and certifying your product at your location, DEMKO can shorten the turn around time. DEMKO's on-site service includes either testing of products at your site by DEMKO engineers or coordinating with your company to use your testing results to obtain certification.

1. Question one, does your company perform its own safety testing for your products?
   Yes - On a scale from 1 to 5, 1 being very limited and 5 being able to perform all tests necessary for certification, how much lab equipment is available at your company for on-site certification of all your products?

2. Does your company use third party testing?
   Yes - Would you please indicate with whom? (record response)

3. Would your company benefit if your products were certified on-site?
   Yes – Would you please indicate how it would benefit? (record response)

4. On a scale from 1 to 5, 1 being very uninterested and 5 being very interested, how interested is your company in on-site service.

5. Would your company consider using DEMKO in relation to on-site service?
   Yes - Would you please indicate why? (record response)
   No - Would you please indicate why not? (record response)

6. On-site service means quicker certification. In terms of percentage, how much more would your company be willing to pay for on-site service?
   (record response)

7. Has your company used on-site services before?
   Yes - What products were certified on-site? (record response)
   What company helped you with the on-site service? (record response)
   No - Would you please indicate why not? (record response)

8. What type of products does your company currently have tested?
(record response)

9. What type of products would your company consider testing on-site in the future?
(record response)

10. During the next two years, approximately how many products would you believe that your company would have safety tested?
(record response)

(Skip if answer to 9 was None)
11. How many of those products would your company consider using for on-site testing?
(record response)

12. In relation to on-site service would your company need to certify your products according to International, European or UL standards?
(record response)

13. On the scale from 1 to 5, 1 being very unimportant and 5 being very important, how important is the turn around time?
(record response)

14. On the scale from 1 to 5, 1 being very unimportant and 5 being very important, how important is cost?
(record response)

15. What countries does your company export to?
(record response)

To better understand our clients I would like to find out some more information about your company. *Ask about all of the following information that you don't already have:*

What is the name of your company?
What is your name?
What is your position?
What is your direct phone number?
What is your e-mail address?
What is your company's web page?
What type of industry is your company involved in?
How many people are employed at your company?
What country are you located in?

Thank you very much for your time.

APPENDIX F

Company Reports

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