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**R. Gene Richter**

**Awards for Leadership and Innovation in Supply Management**

**Category 1: Process**

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## Category 1: Process

### Implementing an Integrated, Company-wide Supply Chain Management Process

#### Innovative Approach

KLA-Tencor integrated supply chain requirements directly into its well established Product Life Cycle Management system, resulting not only in accelerated adoption, and institutionalization of supply chain management (SCM) best practices but also in a major transformation of SCM from support to a strategic function.

#### Introduction

KLA-Tencor (KT), with revenues of \$2B, is the leading supplier of process control and yield management solutions for the semiconductor industry. To maintain KT's competitive advantage in a more challenging business environment, the supply chain organization has transformed itself from a transactional based organization into an organization that enables competitive strategy. Although the process applied fundamental practices, the approach for implementing and institutionalizing the process was innovative. KT pioneered an innovative strategy for implementing and institutionalizing the fundamental practices of SCM. The immediate result of innovation was product cost reduction of over 30%+, a 10 point improvement in supplier performance and 3X reduction in the supply base. Even more significantly, the innovation resulted in a major organizational transformation from transactional to strategic. Given the significance of the impact, KT is applying for the R. Gene Richter award for Leadership and Innovation in Supply Management (process category).

#### Company Situational Analysis

The semiconductor industry is maturing. KT is facing greater competition, resulting in increased pressure on margins and market share. While KT historically competed on a technology leadership basis, it became necessary to also focus on cost, quality, and delivery.

#### Challenges facing the Supply Chain Organization

The supply chain organization was previously structured as a transactional engine, focused on purchase order execution and material shortages. There was little focus on utilizing supply chain management as a competitive strategy enabler, such as strategic sourcing, supplier management, or supply chain design. The organization was effectively a functional silo, separated from engineering and marketing. Compounding the challenge, KT is comprised of twenty highly autonomous divisions with a culture that shows little support for centralized functions

#### SCM Solution

After understanding the key opportunities for his dispersed procurement organization, the Chief Procurement Officer, originally of IBM vintage, immediately focused on institutionalizing 'five pillars': (1) strategic sourcing, (2) commodity councils (3) building negotiation expertise (4) implementing performance based contracts and (5) deploying formal supplier management including supply base rationalization and supplier scorecards. These are essential building blocks, but they do not guarantee fast adoption. In order to generate early engineering involvement, adoption and quick results, the innovation was to leverage KT's well established Product Life Cycle Management (PLC).

With assistance from the Supply Chain Executive, the team designed a comprehensive SCM process around the 'five pillars'. Implementation relied on strong executive sponsorship, skill assessment, training, tool development, and demonstration of value throughout the roll-out. However, the key contributors to organizational adoption were the integration of the process into the fabric of the business and the comprehensive training of both the supply chain and engineering communities. Thus, the SCM process became the 'foundation' for the 'five pillars'.

Specifically, the PLC process was extended to include sourcing actions and requires completion of those deliverables for the product to advance in its lifecycle. SCM was designed into four distinct phases with direct alignment to PLC phases. For example, before a product can exit the Investigation Phase, a strategic sourcing strategy is required. This was a major a break-through because

procurement was not typically included until much later in the process. Furthermore, the role of Technical Sourcing Manager (TSM) was created. It became a requirement that the TSM be a member of the PLC team, guaranteeing proactive involvement for SCM early in the concept investigation phase of the product development process.

Institutionalization was further ensured by including the supply chain process as part of KT's Quality Maturity Model (QMM). QMM is an approach for institutionalizing pervasive processes and evaluating and measuring the maturity of the process throughout the organization. QMM is derived from Carnegie Mellon's Capability Maturity Model for software. Key processes are audited against QMM to ensure that best practices are understood and executed by the cross-functional team. Since all divisional bonus payments are tied to QMM compliance, there was further incentive for the PLC teams to involve the supply chain team early in the sourcing process, make decisions based on business as well as technical criteria, and ensure cross-functional involvement in supplier management and continuous improvement programs.

### **Example of the SCM Solution in Action**

The application of the supply chain process in robot procurement within the Wafer Handler commodity is indicative of the transformation. A wafer handler is included in almost every product KT sells and represents a significant part of the cost of goods sold. A next generation PLC was formed and included a TSM from the start. Supply chain led the sourcing strategy and decision process, the requirement definition, introduced competition, and structured a supply chain to meet KT's cost, quality, and delivery and technology objectives. Rather than designing a custom robot, the team decided to 'commoditize' robots. Market and supply analysis yielded sources outside the traditional semiconductor suppliers. The new robotics suppliers were larger, more diversified, more experienced and more equipped to support the extreme semiconductor cycle. The net results were cost reductions of 40% to 50% and over 50% improvement in lead-time and availability. Meanwhile product performance, quality and field reliability were significantly improved.

### **Customer Feedback**

The adoption of the new process has produced results that have helped the company regain six gross margin points, and be better positioned to compete on cost, quality, and flexibility. The contribution of the supply chain organization has been highlighted in Board briefings by John Kispert, Chief Financial Officer, as being a key contributor to company's success in regaining margin points.

Additionally, the process has been audited by KT customers and has been highlighted on more than one occasion as a best practice. Excerpts from three of the world's largest semiconductor audit results include: "SCM is a key strength" for KT" and gave the function the highest possible rating; "KT's SCM has excellent results against objectives"; and "KT has a well defined supply chain management program along with good Quality Maturity Model".

### **Plans**

Following CMM convention KT defined specific 'Level II' and 'Level III' maturity criteria with targets to reach Level II in FY04 and Level III maturity in FY05. In FY04, 83% of KT's PLC teams reached Level II compliance. In FY05, 100% attained Level II and 83% reached Level III compliance. For FY06, the goal is 100% Level III compliance while the measurement criteria for SCM Level III have been tightened. Meanwhile, KT continues to drive continuous process improvement by raising the bar on results and adding new initiatives like supplier portals. The SCM 'foundation' and its 'five pillars' are enabling KT to continuously extend its competitive advantage.

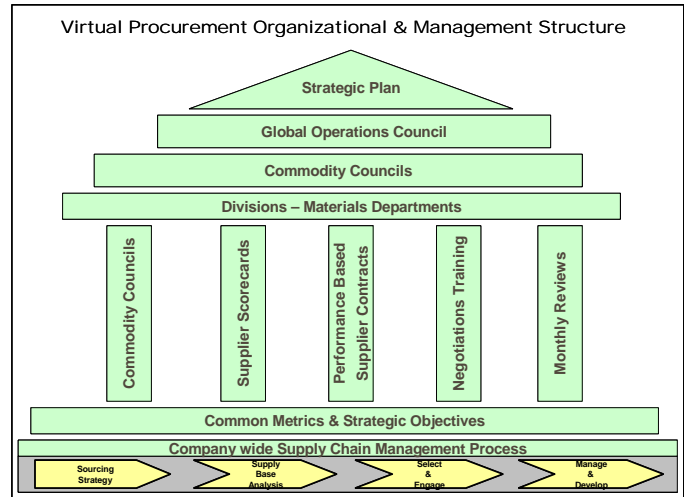
### **Summary & Results**

By forming an integrated process, the supply chain organization has rapidly implemented fundamental supply chain management best practices into the fabric of the company and realized exceptional results that have enabled KT to use supply chain management strategy as a competitive advantage. Over a two year period, SCM has clearly contributed to product cost reductions of over 30%, made significant improvements in incoming and field quality as well as substantial improvement in on-time delivery. In addition to the increased maturity of SCM as measured by the QMM audits, direct results of the SCM strategy can be measured by an increase in spend under commodity management from zero to over 80%, improvement of spend under contract from less than 2% to 77%, a tripling of the number of suppliers under formal scorecard management, a 10 point improvement in supplier scorecard performance and a 3X reduction in the supply base.

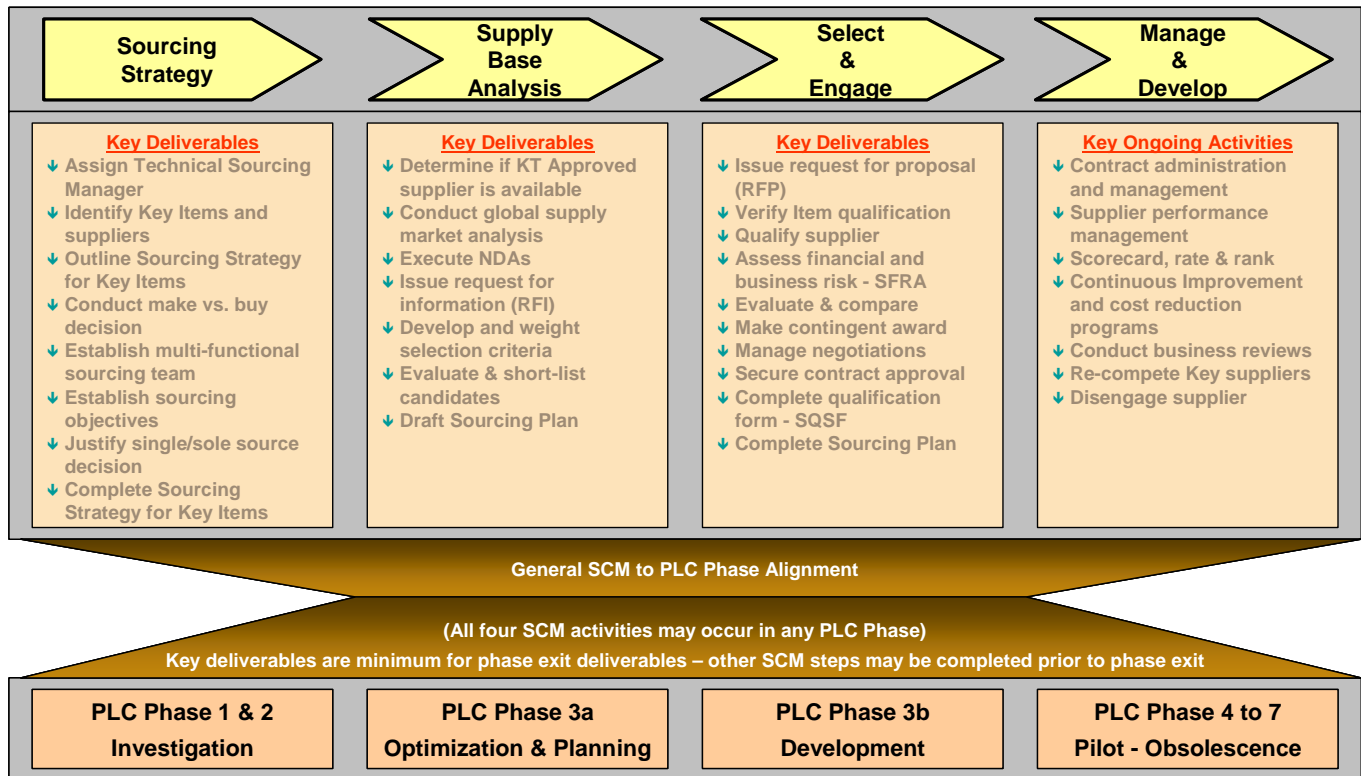
## Supporting Documentation for the SCM Implementation and Results

### Virtual Organizational and Governance Structure

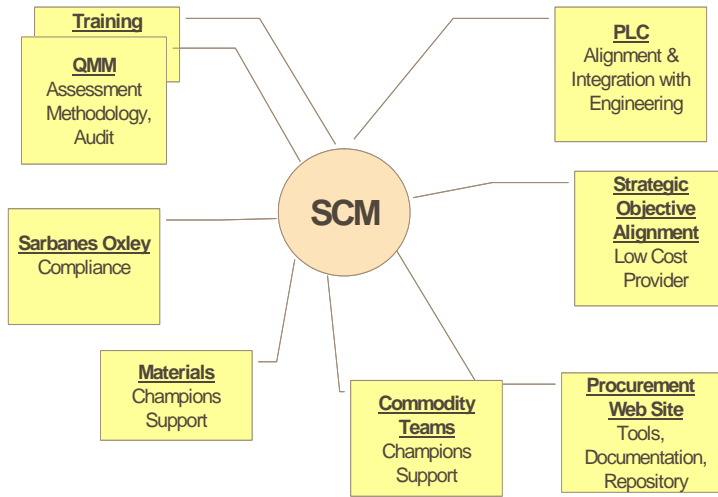
While the SCM process is the 'foundation' and the 'five pillars' represent key best practices that were implemented, it is the virtual organizational structure and the single management system that makes it 'stick'. The Global Operations Council meets monthly. It consists of all the company's VPs of Operations and all Materials Directors. Divisions and Commodity Councils review strategy, plans and results with the Global Operations Council on a quarterly basis. Without any central body, the Global Operations Council creates a virtually centralized organizational management structure. By example, the council has one set of operational and performance measures that all divisions and commodity councils are rated against, thus harmonizing KT's decentralized structure.



### SCM Process Overview – Top and 2<sup>nd</sup> Level



**SCM Linkages**



The SCM process is fundamentally linked into the fabric of the organization. It is aligned and integrated into the PLC process. SCM is one of several company-wide processes measures and monitored within the company's QMM initiative. SCM was inherently designed to support Sarbanes-Oxley requirements. SCM is fundamentally championed and supported by both the Materials Organizations and the Commodity Councils. Company level Strategic Objectives support the program and ensure divisions have the incentive to incorporate. Finally, one internal web-site contains all tools, documentation, training materials and contacts to support the program.

**SCM Process of KPA, Goals, Activities, Tasks**

The Supply Chain Management process defined using the exact same vernacular as the other process utilizing the KT QMM (Quality Maturity Model) framework. SCM itself is broken down into 4 Key Process Areas (KPA). Each KPA is further broken down into Goals. In all 63 tasks are monitored and measured and are directly linked to specific Goals. Attaining compliance is based on strict auditing rules (based on CMM assessments). To achieve SCM QMM compliance a program must PASS all Goals. FAILURE of any one Goal constitutes failure at that level of maturity.

SCM - Defined, measurable, auditable, processes	Sourcing Strategy	Supply Base Analysis	Select & Engage	Manage & Develop	Totals
Key Process Area	1	1	1	1	4
Goals	3	3	3	3	12
Activities	12	9	11	11	43
Tasks	22	13	14	14	63
<b>Totals</b>	<b>38</b>	<b>26</b>	<b>29</b>	<b>29</b>	<b>122</b>

**Example SCM QMM Guide**

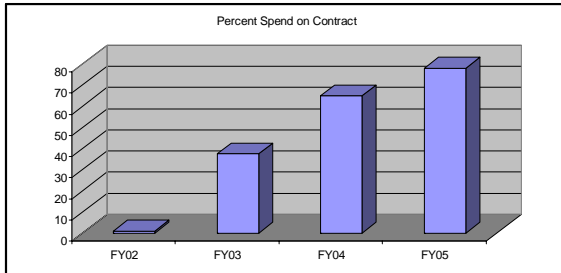
<b>AC1</b>	A Technical Sourcing Manager is assigned to drive supply chain management activities for product release.											
<b>LEVEL 2</b>	The Technical Sourcing Manager (TSM) is PLC technical lead to program manage multiple sourcing, supplier selection and supplier management activities. The TSM will assure deployment of the supply chain management framework in the PLC.											
	REFERENCE: KT Supply Chain Management Process (iNotion 82405) <a href="http://ktweb.kla-tencor.com/prc/prcsmtrx_home.htm">http://ktweb.kla-tencor.com/prc/prcsmtrx_home.htm</a> Strategic Manufacturing Template (iNotion 82241)											
	<b>Assessment Checklist</b>											
	Task	Rev Cntrl?	Database	ID	Rev	Date	Ph 2	Ph 3A	Ph 3B	Ph 4	Ph 5	Ph 6
	<input type="checkbox"/> Technical Sourcing manager Identified in the Strategic Manufacturing Plan.						S	U	U	U	U	U
	<input type="checkbox"/> Technical Sourcing manager trained on SCM process.						S	U	U	U	U	U
	Satisfied <input type="checkbox"/> Partial <input type="checkbox"/> Unsatisfied <input type="checkbox"/>						S - Start, U - Update, E - End					

## SCM QMM Audit Results

In FY04 83% of the PLC teams achieved SCM Level 2 maturity based on a year-end audit of all programs.

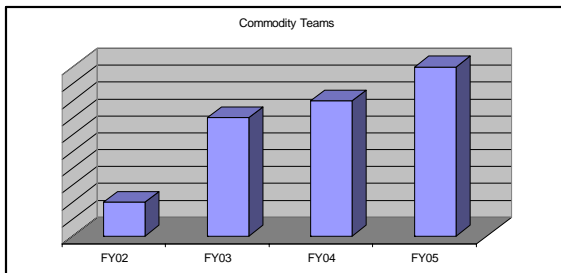
In FY05 100% of the PLC teams achieved SCM Level 2 compliance. Additionally, 83% of the PLC teams achieved a SCM Level 3 state of maturity.

## Suppliers on Contract Trend



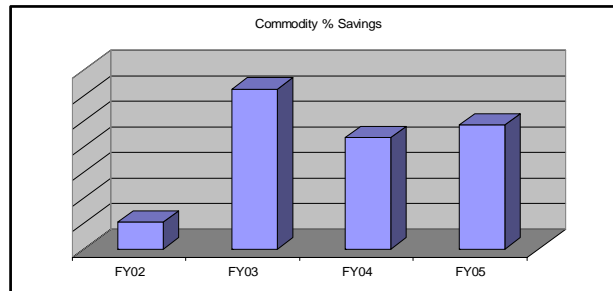
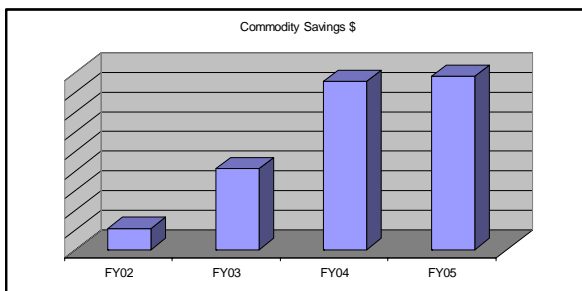
KT rolled out a long-term, performance based standard corporate supplier purchase agreement in 2003. By June 2005, over 77% of material spend was with suppliers on the contract. This represents a dramatic increase since less than 2% were on contract in 2002. Most importantly, the contract improves mutual understanding with our key suppliers and the terms improve our risk profile greatly.

## Commodity Councils



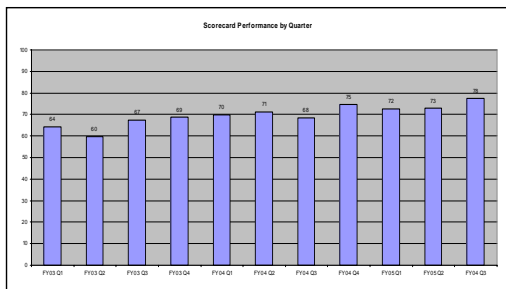
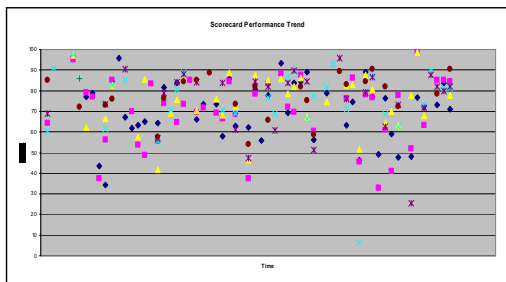
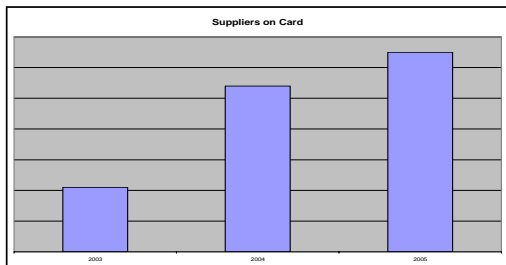
In order to capture the benefits of leveraged spend and focus on strategic commodity sourcing, formal cross functional and cross divisional Commodity Councils were formally launched in 2003. The councils are led by Materials Directors and sponsored by VPs of Operations. By June 2005, over 80% of material spend was being managed through the commodity councils.

## Savings Trend



For the purposes of reporting savings driven by supply chain management actions, only savings against 'actual prices paid' are tracked and measured. This ensures that pure cash savings drop to the bottom line. No cost avoidance or other non-cash measures are reported. Historically, KT was experiencing 0% to 2% annual savings. As a result of the SCM initiative and earlier involvement with engineering, pure savings is averaging in the double digits over the last three years.

## Supplier Scorecard Trend



A comprehensive supplier scorecard system was implemented. There are sixty-four objective criteria being measured across technology, value (cost), quality, delivery and service. In fact, on-time delivery and quality are directly linked into other KT systems and deliver actual performance results.

Based on their scores, suppliers are classified as preferred (scores greater than 80), satisfactory (score between 60 and 80) and unsatisfactory (scores less than 50). Preferred suppliers are eligible for new business.

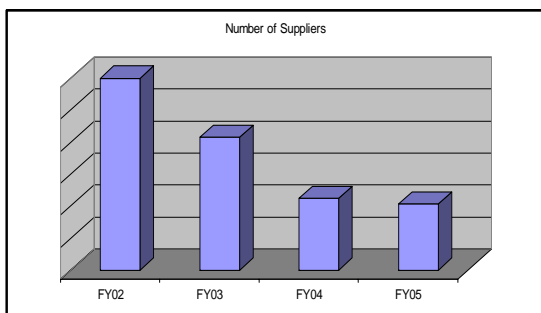
There is also a formally documented supplier business review meeting guidelines for all KT personnel to follow.

The solution itself is a homegrown, web enabled electronic system. Once a scorecard has been completed and approved in the system, the system actually prints out a presentation (power point) for sharing with the supplier. This has proven to be a very productive feature of the tool and has helped adoption.

Since the first year of inception the number of suppliers under formal scorecard management has more than tripled.

Overall, as measured by the scorecard, supplier performance has improved by over 10 points from an average of 64 to an average of 75.

## Number of Suppliers Trend



As a by product of the implementation of SCM and especially the formation of commodity councils and the resulting execution of their commodity strategies, there was a natural reduction in the number of suppliers KT spends money with. Although there was no 'supplier reduction strategy' the number of material suppliers was reduced by 65% as the commodity teams focused on placing new business with strategic commodity suppliers that were on contract and demonstrating good scorecards.

## **Customer Testimonials**

Customers noted SCM as strength in their audits of KLA-Tencor.

In 2004, the world's largest semiconductor manufacturer audited (took place in 2005) KT for supplier control risk assessment program. The results highlighted SCM as a strength; 'with an impressive on-line Supplier Report Card tool'.

In 2005, another large, European based, semiconductor manufacturer audited our processes and noted that SCM had "excellent results compared to objectives, with fast progress".

Also in 2005, a global semiconductor manufacturer, in its in depth business review of KT, identified "a well defined supply chain management program' as strength.

## **Excerpts of External, 3<sup>rd</sup> Party Testimonials**

**Harvard Business Review**, November 2004, "Getting Past Yes: Negotiating as if Implementation Mattered", Danny Ertel. KLA-Tencor cited as a best practice because it "uses the electronic tools available on its supplier-management Web site...its managers can capture valuable information about negotiator's practices, including the issues they are coming up against, the options they are proposing, the standards of legitimacy they are relying on, and the walkaway alternatives they are considering. Coupled with simple post negotiation reviews, this information can yield powerful results."

**Harvard Business Review**, March 2005, "Want Collaboration? Accept –and Actively Manage – Conflict", Jeff Weiss and Jonathan Hughes. KLA-Tencor cited as a case study for its comprehensive negotiation preparation and internal conflict management. Specifically highlighted procurement managing different internal interests across division prior to establishing a coherent negotiation strategy to leverage supplier spend across several divisions.

**Forbes Magazine**, in its January 10, 2005 issue named KLA-Tencor as one of its top 26 "Best Managed Companies in America." The article, which is available online now at <http://forbes.com/platinum400> acknowledges KLA-Tencor's leadership in the tough semiconductor market and attributes its success to "keeping a tight grip on costs while introducing one new product a month."

## **KLA-Tencor Company Background Information**

KLA-Tencor Corporation is the world's leading supplier of process control and yield management solutions for the semiconductor and related microelectronics industries. The Company's comprehensive portfolio of products, software, analysis, services and expertise is designed to help IC manufacturers manage yield throughout the entire wafer fabrication process—from R&D to final yield analysis. Since yield improvements are key to increasing manufacturing productivity and profitability, the yield management market that KLA-Tencor leads has outperformed the semiconductor capital equipment market segment as a whole.

Several factors inherent in the semiconductor industry drive the critical need for comprehensive yield management and process control solutions. Among the most significant of these are: increasing device complexity; shrinking geometries; reduced product life cycles; and increased competition.

At the same time, intense competition in the computing, electronics and communications industries shorten product life cycles, which has a corresponding effect on the semiconductor industry. While ten years ago, a semiconductor product life cycle, from design to production, could span several years, today, six months or less is the norm.

Effective yield management and process control solutions that integrate defect detection and management into the production line after critical process steps help meet these IC manufacturing challenges. By driving increased productivity and yields, such practices have a direct and tangible impact on bottom-line profitability.

Ranked among the world's top ten semiconductor equipment manufacturers, KLA-Tencor offers a broad spectrum of products and services that are used by every major semiconductor manufacturer in the world. These customers turn to KLA-Tencor for in-line wafer defect monitoring; reticle and photomask defect inspection; CD SEM metrology; wafer overlay; film and surface measurement; and overall yield and fab-wide data analysis. These advanced products, coupled with the Company's unique yield management consulting practice, allow KLA-Tencor to deliver the complete yield management solutions customers need to accelerate their yield learning rates, reduce their yield excursion risks and adopt industry-leading yield management practices.

KLA-Tencor typically does not disclose specific customer names or sales data. The Company's products are used in every major semiconductor manufacturing facility in the world. Regional sales data is available in the Annual Report.

There is no single company with a product offering that exactly mirrors KLA-Tencor's broad product line of systems, software and services for process control and yield management. However, in nearly every product area there are companies that make competing products. Some companies that have one or more products competing with KLA-Tencor include Applied Materials, Hitachi, and Therma-wave.

KLA-Tencor's primary market remains the semiconductor industry. In recent years, the Company has also increased its focus on the rapidly growing data storage industry. Looking to the future, KLA-Tencor continues to aggressively invest in new technologies that will address the yield management challenges of tomorrow. As a part of developing the next-generation capital equipment needed for the coming genre of devices, KLA-Tencor continually monitors its development of technologies, platforms, software and support strategies to ensure that they compliment the Semiconductor Industry Association's (SIA) current and future technologies roadmaps.