Highlight

Internal Round Table Discussion:
The Potential of the Field Solutions Business

Our field solutions (FS) business undertakes the maintenance, repair, and modification of semiconductor production equipment supplied by the TEL Group to customers, and until now responsibility for these business activities was spread over multiple organizations, including post-sales divisions. In October 2009 these activities were unified and our FS business launched. Employees involved in this area conducted a round table discussion of the potential for FS business (the discussion was held on June 28, 2010).

Generating innovation in the FS business

Moderator: Business models in the world are changing dramatically. From now on not only cutting-edge but also low-cost and other numerous semiconductor applications are going to become necessary, especially when aiming at developing countries. Is there a relationship between the background to these times and the launching of the FS business?

Kaminaga: In our FS business, the entire TEL Group is responding to the polarization of the market into competing with cutting-edge technology and effectively utilizing existing devices and production lines through the sale of TEL-certified used equipment and other efforts. Since there is expected to be demand for FS business products and services centered on consumables even during economic downturns, the business is thought to have the potential to contribute to the stabilization of operations. We are also developing new business models that provide not only hardware-related but across-the-board high-level equipment operation support. We can perceive changes that have come to the surface within the companies in relation to this move in the last six months. Active communications from our locally based affiliates overseas are also increasing, with local offices responding to local situations and creating ideas independently.

Asano: I feel that the equipment modification business, which was inactive only a few years ago, has really changed. Our company is now calling this a period of innovation and growth. In the FS business, too, we intend to construct new business models and generate innovation.

Sakamoto: I think that one way to generate innovation is through interpersonal communication. By expanding our FS business, our close communication with customers has become livelier than ever before and this has promoted innovation. Moreover, by making use of the broad knowledge and know-how we have accumulated in developing both hardware and software, we provide consulting services for our customers mainly to boost yield and improve wafer productivity. We believe that we should proactively provide support based on our knowledge to not only customers requiring cutting-edge technology but also customers desiring to improve the production efficiency of their existing semiconductor factories so that they may achieve the same level of operations as cutting-edge semiconductor factories.

Fumihiko Kaminaga
Manager
Field Solutions Dept.
Tokyo Electron Limited

Akira Onodera
Field Solutions Dept.
Tokyo Electron Limited

Ritsuro Maekawa
Field Solutions Dept.
Tokyo Electron Limited

Minoru Kunugi
Kanto Field Solutions Dept.
Tokyo Electron FE Limited

Koyu Hasegawa
Development Group
Tokyo Electron PS Limited

Takanobu Asano
General Manager
Technology &
Development Division
Tokyo Electron PS Limited

Joji Hoshi
Environment,
Health & Safety Center
Tokyo Electron Limited

Koichi Sakamoto
(participating via teleconference)
Field Solutions Dept.
Tokyo Electron Limited

Tokyo Electron's used equipment business

Moderator: Please describe the situation regarding used semiconductor production equipment.

Kaminaga: Power semiconductors* and other devices still use small-diameter wafers today. If applications can be adapted, production can be carried out even with used equipment. However, some customers say that the latest equipment is better for dealing with fine particles of dirt and dust.

Sakamoto: We occasionally provide consultation regarding used equipment. There are more problems with how to deal with dirt and dust particles than there is for new equipment.

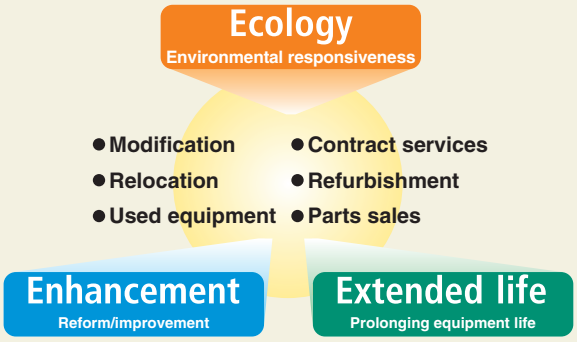
Onodera: One key point in the TEL Group's used equipment business is that the equipment is sold only after improvements have been made to enable it to handle dirt and dust particles. These measures are not undertaken after the used equipment is installed in the customer's factory but beforehand. We believe it is best that the equipment is first taken to one of our factories where it is refurbished (repaired, inspected, etc.) so that it will function adequately at each specific customer site before being delivered to the customer. In this way, defects resulting from aging degradation and various other problems associated with used equipment can be avoided.

Maekawa: Some customers require products that are low-cost. By launching our FS business and dealing in used equipment, we have latched onto a new market. I think it is good to pursue our used equipment business while at the same time maintaining our customers in the cutting-edge equipment field.

Kunugi: We also provide replacement parts for equipment that is still used at customer sites but is no longer in production, by reusing parts recovered from used equipment we have collected. The TEL Group provides part replacement support for up to eight years after production of the equipment stops, but the results of a survey show that 86% of the models that we produced and delivered 22 years ago are still in operation. Currently, six years after production of the equipment ceased, we are collecting opinions on our support from major customers, and so our policy is to respond to these requests to the very best of our ability.

* Power semiconductors: semiconductors that can convert/regulate power voltage/current with high efficiency

Main FS Business Services



Reducing costs by listening to workers' opinions and utilizing their experience

Moderator: It seems that ideas are sometimes born from discussions with customers. What about the awareness of workers?

Onodera: In attempting to satisfy our customers' high-level requirements, engineers make improvement after improvement, which leads to new ideas and our business expands. Our business requires knowledge about not only semiconductors but also electricity, gas, machinery, and a diverse range of other fields. I know that all of our engineers in our various workplaces find the work very interesting.
Maekawa: In marketing you need substantial knowledge of how to achieve optimum operations through equipment modification and the costs must be appropriate. We are working out how to reduce costs by making trial-and-error efforts in cooperation with plant staff.
Hasegawa: Awareness of cost has taken root in our FS business because of the constant need to reduce costs, including for marketing, and we endeavor to control costs from the development stage.
Moderator: I assume that veteran engineers, in particular, play an active role in many aspects of the FS business. Is this the case?
Kunugi: Certainly. Each of our engineers has accumulated experience and knowledge, and so they play important roles in various aspects of the business. I think it's necessary to utilize the expertise of experienced engineers effectively.
Onodera: Engineers' rich experience and skills generate customer satisfaction and this leads to trust. I think in this business the strength of the workplace brings benefits directly to both parties.

Customer Comment

Because of Tokyo Electron's consulting services, we have been able to significantly reduce waste in semiconductor production, decrease the rate of defective semiconductor devices, and improve our yield ratio. The cumulative economic effects equal several hundreds of millions of yen in cost reductions and have contributed to reducing semiconductor device costs.

Shinya Watanabe
Chief Engineer
Production Technology No. 2 Division
Naka Factory, Production Headquarters
Renesas Electronics Corporation

Reducing customers' environmental impact through FS business activities

Moderator: Increased yield and reduced equipment standby times also lead to reductions in environmental impact. To what extent are customers concerned about this aspect?
Hoshi: Customer interest in reducing environmental impact is becoming higher than ever before. With respect to reducing environmental impact, what is important is not just simply emphasizing the environment and energy conservation but instead making proposals that position energy as a cost; timing is also very important. For example, energy-saving models or functions are effectively recommended to customers who plan to replace equipment. Adding functions after the equipment is installed increases costs, so relocation of equipment or a factory is also a good time to suggest and implement environmental measures.
Asano: Without legislation or numerical targets set by the government to reduce environmental impact, it would not be easy to go after environmental measures head-on. We are considering ways of incorporating energy-saving functions into our products effectively from the development stage.
Kaminaga: As old equipment generally does not have modern energy-saving functions, some people think that old equipment hinders the customers' effort of reducing CO_2 emissions. Many customers ask us for advice on the effective use of high-energy-consuming parts such as pumps, heaters, coolers, and main units.
Onodera: Sometimes it's difficult to get customers to accept proposals for reducing CO_2 emissions because the return on investment is difficult to discern. I think it is also important to obtain the understanding of the customer's top management with an easy-to-understand proposal before moving ahead.
Moderator: From the perspective of saving and reusing resources, I think that utilizing used equipment is appropriate for the times. Are there any expectations for the FS business from the environmental division?
Hoshi: We view prolonging the life of equipment itself as more important than parts. When you look at environmental impact from the perspective of the product lifecycle, continuing to use old equipment is one way of efficiently using resources, and I think this is a point that we need to emphasize in promoting used equipment to customers. Furthermore, while persistent efforts are being made to make all our major products more eco-friendly, we expect additional efforts to be made by developing other devices supporting environmental measures, including a system for visualizing data on energy use.
Kaminaga: Currently we are analyzing benchmark survey

results and yield management data and checking the findings against our knowledge to enable us to formulate proposals for improvements.

Sakamoto: It is necessary to transform the data we have gathered from information into knowledge. Only after we go through this process, we will be able to use that knowledge to make new proposals, including data on energy-saving pumps, which we have recently begun to promote. We intend to expand these proposals.

Maekawa: In order to sell used equipment, we should emphasize the environmental conservation aspects such as reducing CO_2 emissions. Purchasing new equipment for replacement entails disposing of the old equipment, which has a considerable impact on the environment. We are working to help customers understand that it is possible to achieve a greater reduction in CO_2 emissions by reusing used equipment rather than simply by purchasing new equipment.

Opinions voiced in the round table discussion

Listening to the opinions expressed by the various participants in the round table discussion, I was reminded of the potential of our FS business, which was launched in response to the changing needs of society.

The TEL Group has been conducting its business activities with the trust of our customers, which we have gained through reliable service and cutting-edge production equipment. However, customers' interest is not limited to the purchase of new production equipment but has also begun to include the combined utilization of existing production equipment and used production equipment. The FS business was launched with the objective of responding to these new needs.

In our sales of TEL-certified used equipment, the TEL Group handles high-quality used equipment through certification based on our independent standards. Our base has recently expanded with the introduction of new used equipment, which is produced using the same method as new products, using pre-owned units for some parts. Of course, considering how to best utilize our corporate strengths, I believe that the FS business will be in an extremely important and attractive position in 10 to 30 years for covering the needs of the used equipment market, which is expected to expand.

Looking also at our utilization of human resources, because the requirements of customers in the used equipment market differ from those of customers buying new production equipment, I believe the FS business is a very attractive field for veteran engineers, whose technological expertise and experience are necessary for answering questions such as "How do we maximize efficiency?" and "What are the issues involved when we consider overall optimization?" They are also given the opportunity in this field to work with young engineers in creating something new. With so many types of equipment in existence, the TEL Group has a tremendous advantage in identifying where any problems lie due to our extensive knowledge of multiple types of equipment and production lines. When we are able to come up with complex solutions, the FS business is sure to become even more interesting.

Like other industries, the semiconductor industry is cost-sensitive; therefore, reducing costs for electrical power consumption and conserving cleaning solution and resist are high priorities. Unfortunately, production equipment did not have sufficient energy-saving functions in the past, but if current technology can be fed back into this equipment, I believe it can also contribute to reducing environmental impact by conserving resources and energy while at the same time reducing costs.

Utilizing one technology effectively for a long time leads to an eco-friendly business. Moreover, amidst an industry-wide trend toward eco-friendliness, we intend to take a leadership role in promoting these activities and strive to encourage other equipment manufacturers to understand the importance of these efforts.

Kiyoshi Sunohara
General Manager
FSBU
Tokyo Electron Limited