

Develop Next-generation about Innovative Change to Our



SPECIAL TALK

President, NGK Insulators, Ltd.

Taku Oshima

| Profile |

Joined NGK in 1980; General Manager of NAS Battery Division, Power Business Group (2004); Vice President and General Manager of NAS Battery Division, Power Business Group (2007); Senior Vice President, General Manager of NAS Battery Division, Power Business Group(2011); President of NGK (2014).

Professor at College of Business,
Rikkyo University

Mika Takaoka

| Profile |

PhD in business administration. Field of study: retail business management; franchise systems; sustainable communication and consumer behavior. Membership: Ministry of Economy, Trade and Industry Industrial Structure Council Global Environment Subcommittee Evaluation/Verification WG (low-carbon society action plan follow-up), etc.

Products that can Bring Future Society and Environment



NGK's strengths to support its sustainable growth

Takaoka: NGK Insulators started as an insulator manufacturer, and from that foundation it has developed business in various areas over many years. In what areas have you been achieving notable growth recently?

Oshima: Our business is particularly growing in two key areas. One is associated with automotive exhaust system. We produce exhaust gas purification parts which are our main products with a global market share of around 50% and

NOx sensors for automobiles. The total number of vehicles sold globally in one year has reached around 90 million, and the number is growing at an annual rate of 3 to 4%. The market for zero-emissions cars, such as electric vehicles, has been expanding in recent years, but automobiles equipping internal combustion engines, including buses and trucks, still dominate the automotive market by a wide margin. Against this background, emission regulations are becoming more stringent around the world, pushing up the demand for exhaust gas purification parts and NOx sensors.

Takaoka: That indicates the grave responsibility your company bears as a supplier. In order to achieve mass-production on a large scale, what is your situation of



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investments in facilities and R&D?

Oshima: We are carrying out intensive investments in growth areas, including building new factories in Poland and Thailand. We plan to invest a total of 300 billion yen for all segments over the three years from fiscal 2017. Out of that total amount, 170 billion yen will be spent on automotive-related business. At the same time, we are vigorously increasing investment in the semiconductor-related business, another key growth area, to boost facility and R&D capabilities.

Takaoka: The semiconductor market has been expanding to meet soaring demand related to needs for larger-capacity and higher-speed mobile communications and increasingly popularized IoT applications. The market is expected to further grow in response to rising requirements from endeavors to accelerate technological innovation in AI and other frontier realms of social infrastructure.

Oshima: NGK plays a part in supporting the rapid progress of the pioneering technologies by supplying essential functional ceramic components of semiconductor manufacturing equipment. There are only a few ceramics companies in the world capable of manufacturing equivalent products.

Takaoka: How has NGK acquired those specialty capabilities? Having such multiple specialty technologies and products that enable you to maintain advantages against others gives you a great strength.

Oshima: That is our unique value originated with an insulator manufacturer. Insulators are a very long-lived product. To ensure the effective use of our products over decades, we have been persistently striving to achieve ever-higher quality, and developed unrivalled technologies. Also, we began in our early days to pursue business diversification. We have invested our earnings in R&D, seeking to build future growth pillars. We have continued this approach to expand the company.

Capture future needs and develop technologies

Takaoka: To plan successful R&D projects, it is vitally important to carefully read the future to correctly forecast social needs. NGK's successful diversification has proven its insight into future needs.

Oshima: The success we have had in the NOx sensors, one of our recently established mainstays, is the result of research efforts continued over two decades. Many years of assiduous works enabled us to supply them timely when the society needs.

Takaoka: Within your marketed lineup, I view NAS batteries as having huge growth potential, given the fact that currently very few enterprises commercialize large storage battery systems.

Oshima: Global efforts are being exerted to achieve a low-carbon society, where a major power source will be renewable energy. Under such circumstances, a large battery system is indispensable to achieve the stabilization of renewable energy. Seeking to meet this future demand, we are promoting R&D further.

Development of human resources and work environment to achieve further growth

Takaoka: What are your views and actions regarding human resource development?

Oshima: Development of human resources and work environment has been an important management theme since I became president. I believe that the key to accomplishing the theme is the self-initiative of individual employees. I wish to create a workplace where each employee is inspired to take up a challenge at their own initiative. I'm wondering all the time what I should do to encourage their initiative or to boost their motivation. Toward

this goal, I took the first step by touring the Group companies and manufacturing sites in Japan and overseas and every division within the company to take a firsthand look at each site in operation.

Takaoka: What did you find from this field research?

Oshima: Every factory I visited was running at its fullest-ever capacity to continue increasing production, keeping workers extremely busy. I saw this situation as needing immediate improvement so that they can effectively demonstrate their potential to perform truly important tasks. To this end, it is necessary to review each work process and practice to thoroughly eliminate waste. To carry out this task across the company, I have launched the E3 (E-Cubed) activity*. Since work style reforms require a top-down management approach in part, it has been introduced at each division under the leadership of the division head, who has established organizational policies and announced them to division members.

Takaoka: The top commitment can facilitate improvement of frontline operations. Then, the more operational efficiency will increase, the more employee motivation will rise. This is becoming increasingly important as businesses in many industries need to take steps to increase employee satisfaction to address the emerging challenge of a labor shortage.

Oshima: To be able to attract and retain quality talent that will continue to contribute to the company over the long term, we have reformed a range of personnel systems, effective from this year. Major reforms include the revision of systems for general employees to encourage mid-career or younger personnel to undertake challenging tasks, and lifting the mandatory retirement age up to 65 to offer senior personnel opportunities to work for longer and with a sense of security. The revised systems also include measures directed at women's career enhancement.

Takaoka: The gender equality issue is particularly specific to the manufacturing sector, where rates of female workers and managers are relatively low.

Oshima: Contrary to the industry trend, at NGK, the average duration of service of female employees is longer than that of males. This is partly attributable to our systems that have been enhanced to support work-life balance. However, we are behind in terms of employing female managers. To overcome this shortcoming, we have begun to implement initiatives to spur the development of future female managers.

Aim to attain further growth with bringing together all NGK forces around the world

Takaoka: The NGK Group has a sizable workforce employed globally to pursue global business.



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Oshima: Our Group currently employs a total of more than 20,000 people, and more than half of them are working outside Japan. It is very important that we uphold a shared vision to unite as one for advancing our business. In two years, NGK will celebrate the centennial of its founding and prior to this major milestone, we have begun to consider revising the corporate philosophy.

Takaoka: I am interested in the new philosophy to be announced in the near future while also looking forward to the rollout of new products that can bring about an innovative change in our future society and environment.

Oshima: NGK's products are indispensable parts of many products related to electricity, vehicles, communications and other forms of social infrastructure that supports modern lifestyles. We will step up our efforts across the Group to continue manufacturing and supplying quality products to contribute to a better society and environment.

* E3 (E-Cubed) activity
Pursuing our Essence
Eliminating Waste
Increasing Efficiency