

Risk Management

In line with business expansion, the NGK group is also engaged in minimizing risks related to globalization and diversification while augmenting our risk management structure. The CSR Committee periodically confirms and follows up on the status of Company-wide risk countermeasures to ensure every effort is being made to manage business risks.

Basic Approach

The NGK Group Guidelines for Corporate Behavior were announced within and outside the company as our basic stance toward the realization of the NGK Group corporate philosophy of creating new value by providing products and technologies that contribute to a better social environment. This includes initiatives that strictly observe the protection of third party rights and corporate assets and trust through the practice of risk management.

Reference URL

> Corporate Philosophy and Guidelines for Corporate Behavior
<http://www.ngk.co.jp/info/governance/index.html>

Risk Analysis and Response

The NGK Group assumes six categories of company-wide risks pertaining to compliance, information, employment and labor, making an effort to avoid and prevent these risks through deliberation of budgets and plans and overall examination and analysis in the course of execution and settlement processes at Strategy Committee and Executive Committee meetings.

Business continuity planning (BCP) was formulated to ensure the continuation of critical business functions in the event of large-scale natural disasters including wind and flood damage and earthquake, massive transportation accidents or other emergency situations, which will be addressed by the Central Disaster Prevention and Control Headquarters and BCP Countermeasures Headquarters.

Company-wide Shared Risks

Category	Risk
1.Compliance	Legal / Regulatory infractions / improper accounting
	Misappropriation by individuals
	Bribery
	Violation of intellectual property rights
	Human rights violations/harassment
	Trouble with local communities
	Support for antisocial forces
2.Information	Information systems breakdown
	Leak of proprietary or personal information
	Inappropriate use of SNS

Category	Risk
3.Employment/Labor	Labor troubles
	Labor accidents
	Traffic accidents
	Long-working hours/health management
	Support for unskilled labor
	Labor issues at suppliers and subcontractors
4.Incidents /Accidents /Disasters	Incidents and accidents
	Natural disasters
5.Environment	Environmental management trouble
	EMS insufficiency
6.Product safety	Defective products

Business Risks

Production Bases

The NGK Group's main production bases are located in Aichi Prefecture and Ishikawa Prefecture in Japan, and overseas in the Americas, Europe, Asia, and other regions. The Group operates a global production system for its core products, such as ceramic honeycomb substrates for automotive catalytic converters, from the perspective of manufacturing close to demand centers and achieving optimal production. This ensures that risk is dispersed among manufacturing sites. However, irrespective of whether a production base is in Japan or overseas, if facilities at a major production base are seriously damaged by a natural disaster such as an earthquake or fire, production may stop for a considerable period of time, thereby adversely affecting the NGK Group's business performance and financial condition. Overseas operations, in particular, carry such potential risks as i) compliance with the host country's laws, regulations or taxes, ii) adverse changes in the economic environment such as fluctuations in exchange rates, iii) difficulty in securing, educating and training personnel, iv) inadequate infrastructure, and v) societal problems such as terrorism and war.

The unforeseen occurrence of any of these events could adversely impact the NGK Group's business performance and financial condition.

Exchange Rates, Interest Rates, and Material Prices

The NGK Group produces and sells products worldwide. Consequently, the Group hedges the risk of short-term changes in the exchange rates of major currencies, particularly the U.S. dollar, euro and yen, with forward foreign exchange contracts and other financial instruments. However, appreciation of the yen could cause a decline in net sales and earnings, which could adversely impact the NGK Group's business performance.

The NGK Group plans to continue making the necessary capital investments to expand its businesses and improve productivity. The Group's funding needs include these capital expenditures and the redemption of corporate bonds. In the event of interest rate rises, future fund procurement costs may increase, which could adversely impact the NGK Group's business performance and financial condition.

Rises in raw materials prices have led to higher manufacturing costs at NGK Group businesses. To minimize this factor, the Group raises sales prices, cuts costs, improves productivity, and reduces business expenses. The NGK Group endeavors to absorb rises in purchasing prices, but excessive rises in the prices for raw materials may adversely impact the Group's business performance and financial condition.

New Products

The NGK Group works to create new products to secure its growth prospects. The Group makes focused investments in new products that should become pillars of growth in the future. At the same time, NGK is making capital expenditures in stages for products for which demand is expected to expand. However, in the event that these capital expenditures are not made on schedule, this may adversely impact the NGK Group's medium-term growth prospects.

Changes in the Business Environment

Demand for the products that the NGK Group manufactures and sells is strongly influenced by changes in the economic climate in and outside of Japan. Such changes may adversely impact the Group's business performance and financial condition.

Product Quality

Guided by its Corporate Quality Policy, the NGK Group conducts quality-related activities in a committed drive to ensure consistent high quality. These efforts notwithstanding, the Group cannot completely eliminate the possibility of quality-related issues from every product that it sells or manufactures. The occurrence of such problems could therefore have a substantial and adverse impact on the Group's business performance.

International Investigation related to Competitive Conditions

The NGK Group is currently the subject of an international investigation related to competitive conditions and is giving its full cooperation. The investigation is being conducted by authorities concerned with competition, and depending on the outcome, there may be an adverse impact on the Group's business performance and financial position.

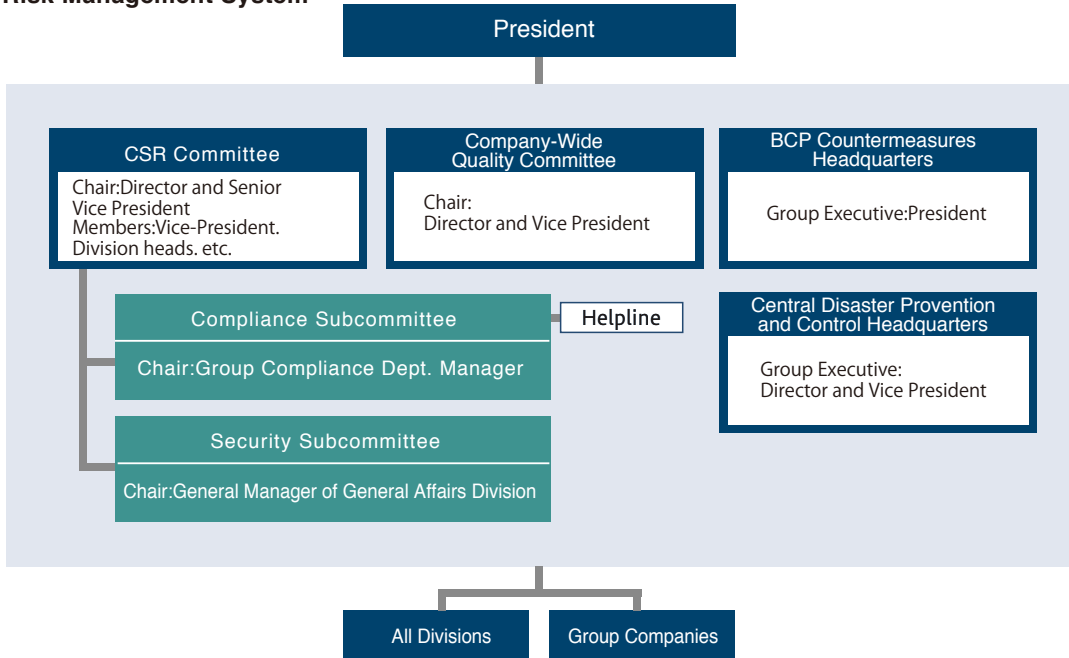
Reference URL

> FY2017 results
presentation materials
<http://www.ngk.co.jp/IR/library/presentation/pdf/201704.pdf#page=3>

Risk Management System

NGK operates a risk management promotion structure led mainly by the CSR Committee. A person of responsibility and response structure is established for each risk category in an effort to improve risk response capabilities and risk prevention activities.

Risk Management System

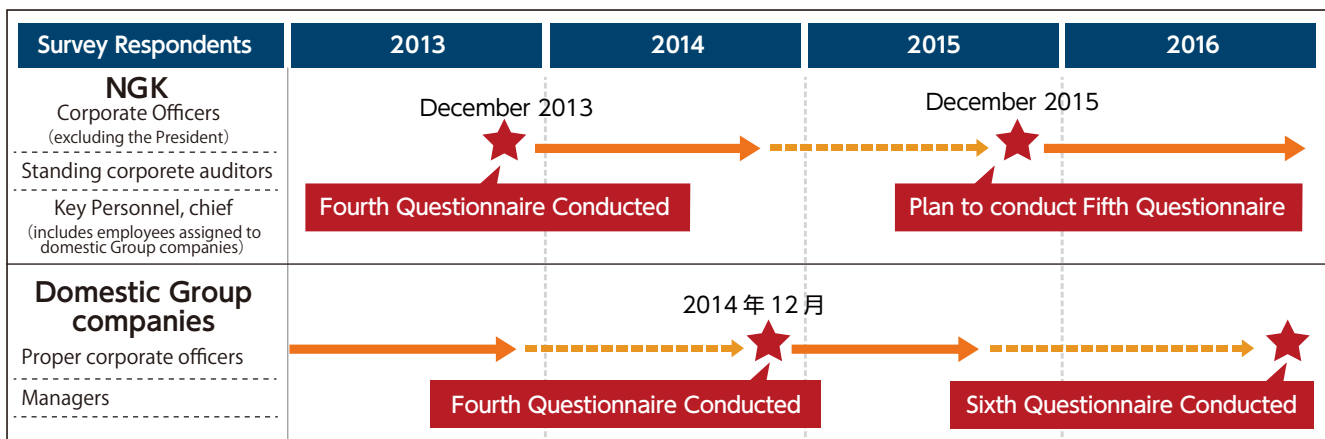


Risk response

Normal operations	Follow up by CSR Committee and other committees	
Emergency situation	Legal/Ethical or incident/accident response	CSR Committee is in charge. Initial response by five people chosen ahead of time to handle emergencies + relevant corporate officers.
	Quality-related accidents	Company-Wide Quality Committee is in charge
	Disaster-related incidents	Central Disaster Prevention and Control Headquarters and BCP Countermeasures Headquarters are in charge

Identifying and Preventing Risks Based on the CSA Questionnaire

As part of an effort to enhance risk management practice, NGK and its domestic Group companies conduct the Control Self Assessment (CSA) questionnaire with the aim of grasping and preventing various potential risks arising from daily business operations, and of checking the understanding of respondents regarding potential risks and their impact. Based on the results of the questionnaire, risk management measures are planned by the relevant divisions, departments. This tool is also beneficial for employees as it provides them with a follow-up opportunity to understand the appropriate risk response procedures. We will continue this project going forward.



Number of applicable employees and response rate for the questionnaire conducted in December 2015: Number of applicable employees: 1703/ Number of respondents: 1640 (Response rate: 96.3%)

Risk Management Measures Based on the CSA Questionnaire

Company-wide risks

Note: Human Resources, Legal, General Affairs, Purchasing, Information Systems, Environmental Management, Company-wide Quality Management and Construction and Maintenance departments

Category	Measures conducted in 2ndH FY 2016
Group/General	<ul style="list-style-type: none"> Conducted monitoring surveys on understanding of responses to incidents specified in the internal Basic Rules of Crisis Management
Compliance	<ul style="list-style-type: none"> Enhanced anti-bribery compliance training Continued to enhance competition law compliance systems Continued the ongoing compliance-related training and seminars Continued the ongoing practical support to individual divisions and Group companies Confirmed the software management status of all overseas Group companies
Information	<ul style="list-style-type: none"> Introduced anti-targeted attack programs in four Group companies Took inventory of portable recording media Introduced security measures for using wireless LAN networks outside the company and for web conferences Held regular training programs for desktop and LAN administrators Introduced highly-confidential document management systems
Employment/Labor	<ul style="list-style-type: none"> Promoted work time management ; Promoted for satisfying health support toward long-hours workers Indicated division and individuals with long overtime work Promoted blanket risk assessment and conducted risk training Introduced disaster control in case of occurrence at several sites
Incidents/Accidents/Disasters	<ul style="list-style-type: none"> Established guidelines on leaving work for home for each region; Established disaster preparedness plans Created risk response plans for each overseas site Held safety seminars for intended expatriate employees and their accompanying families Created basic guidelines on business trips Developed overseas safety management systems for Group companies in Japan
Environment	<ul style="list-style-type: none"> Conducted patrols and drills according to EMS plans
Product Safety	<ul style="list-style-type: none"> Held follow-up discussions at the Quality Committee and Quality Review meetings

Legal Risk Management at Overseas Group Companies

The NGK Group is engaged in strengthening its ascertainment of legal risk management status in overseas business to minimize the globalizing and diversifying risks associated with business expansion.

We ask all overseas group companies to report information pertaining to the status of lawsuits, legal affairs and consultation with lawyers twice a year, and helpline usage, export controls and access to legal-related information once a year. Major issues found in such reports are reported to the Compliance Subcommittee and CSR Committee to share information. Consultations from overseas locations were handled by lawyers and legal departments to avoid risks.

BCP Initiatives

The NGK Group is developing Company-Group-wide Business Continuity Planning (BCP) through the establishment of the BCP Headquarters, an organization for leading business continuity and quick recovery in the event of a large-scale natural disaster, led by the President. Countermeasure initiatives include the establishment of multiple manufacturing bases and procurement sources, the damage mitigation measures related to building and equipment and employee safety assurance.

We conduct emergency drills assuming a natural disaster as a field exercise of the BCP. In the drill, participants are instructed to take real actions faithfully according to the plan, through which we identify in detail issues related to each process and procedure and use the findings to improve the BCP.



Fiscal 2016 Initiatives

- Reviewed major BCP initiatives according to the launch of new business/products
- Expanded the scope of the disaster scenario to cover more broad area from the previous one centering on Nagoya, Chita and Komaki

Future Plans

- Review the assumed damage and counterplans based on the expanded disaster scenario, and study the reaction plans against the subsequent earthquake after the first huge earthquake's strike
- Enhance the effectiveness of the BCP through the more practical drills using a sophisticated scenario and expanding the target scope and object persons

Intellectual property management

The NGK Group encourages the creation of intellectual property (IP) rights through providing relevant education and works to ensure proper acquisition, protection and use of IP rights based on the policy of respect for the rights of others and ourselves alike.

Accordingly, the Intellectual Property Department is building a strategic patent database in close cooperation with business, research and development, and technology divisions. Specifically, it features a patent mapping function to present the internal and external patent landscape of specific technology areas using charts and graphs, which can be easily shared within the Group. To prevent patent infringement risks, we regularly conduct external patent monitoring by product line and development theme to update our database. As of March 31, 2017, NGK holds 3,038 Japanese patents and 4,134 patents from other countries.

Number of patents held as of March 31, 2017

National patents of Japan **3,038**

Foreign patents **4,134**

Responsibilities of the Intellectual Property Department

<ul style="list-style-type: none"> Application for/acquisition of IP rights (patent, utility model, design) To establish IP rights for NGK's development achievements to safeguard the corporate assets on a legal basis
<ul style="list-style-type: none"> Patent search To confirm the latest external patent landscape, mainly to prevent patent infringement risks
<ul style="list-style-type: none"> Administration and operation of patent management systems
<ul style="list-style-type: none"> Administrative work relating to acquired patent rights, including: maintenance of rights; payment of patent incentives; and cooperation with patent offices
<ul style="list-style-type: none"> Application for/acquisition and maintenance of trademark rights for corporate logos and product trade names and marks
<ul style="list-style-type: none"> Internal IP training

Awareness Programs for Managers

NGK conducted manager-class awareness programs to enhance intellectual property strategy in the research and development and business divisions, making use of issues identified in these programs in NGK's intellectual property strategy.

In fiscal 2016, we held the 8th session of the lecture series "Considering Intellectual Property" in March. As guest speaker, we invited Mikiya Ishihara, a former intellectual property department head of Sekisui Chemical Co., Ltd. He talked about "intellectual property activities at Sekisui Chemical," focusing on enhanced strategic initiatives for examining and analyzing competitive technology trends using collected patent information, and reflecting the results in business and development strategy planning. The session was attended by a total of 116 employees.

Promoting Intellectual Property Training

Young Engineer Training

Patent search training programs are provided on an ongoing basis, mainly targeting young engineers from research and development departments. The programs offer individual computer-based practical curricula.

In fiscal 2016, we provided basic training for young engineers and also offered e-learning programs and seminars to improve skills necessary for patent application.

IP training provided in FY 2016

	Intended participants	No. of actual participants
e-learning	Young engineers	58
Seminars on patent law (Patent I, II, III)	Young engineers	130
Seminars on license agreement and IP strategy	Responsible employees	14
Seminars to acquire skills for using the IP search program	Responsible employees, engineers	89
Small-group workshop	Young engineers at R&D and business divisions	103 (total for 8 sessions)

Employee Invention Reward System to Provide Incentives for Employee Inventions

NGK has established an employee invention compensation system comprised of application incentives, registration incentives and performance incentives and fairly compensated employees in order to encourage inventions, and from a legal viewpoint, based on the Patent Act. Performance incentives are paid to the relevant inventors from profits derived from products associated with patents acquired by NGK. Group companies in Japan have established a similar employee invention reward system, thereby seeking to spur the invention promotion initiative across the Group. To further expand this effort globally, we are working to introduce a reward system to overseas Group companies in consideration of local legal systems and labor practices, in order to facilitate employee inventions and protect individual inventors' rights.

Provision against Intellectual Property Risks Overseas

To support NGK's automotive exhaust purification ceramic products business, which is engaged in global production activities, we have built a mechanism for appropriately managing inventions overseas. NGK promotes the practice of intellectual property management overseas at the same level as in Japan.

At NGK Ceramics Suzhou (China), we continually carry out activities for "prior use defense" as part of efforts to protect our intellectual property. Prior use defense refers to a legal system in which a company can claim the right of prior use in case its competitors file a patent application for technologies that the company has kept confidential as secret know-how, by proving its precedence to the day of application filing in terms of technological implementation, thereby seeking to ensure continued business.

TOPIC

Overseas IP training

NGK offers overseas training programs to develop international IP experts, sending young employees to the U.S. and Europe. From 2016, **Masashi Yasui** from the Intellectual Property Department attended appropriate courses at the Munich Intellectual Property Law Center (MIPLC) in Munich, Germany. Following this, he will receive practical training at local patent firms from since October.



Yasui (sixth from left in the back row) and other students at MIPLC