Invisible values drive value creation
Our world-leading technologies and manufacturing capabilities, corporate culture to develop and bring out the best in our people, strong relationships of trust with customers that have been accumulated through our efforts to help solve customers’ challenges—these are all examples of our strengths that do not appear on the financial statements, and are the base that supports our growth. We will further enhance such “invisible values,” hand them down to the next generation, and aim to realize sustainable growth.
INNOVATION OF TECHNOLOGIES

Aiming for further advancement in technology

As a key part of NSSMC’s anticipation and response to diversifying societal needs, characterized by changing consumer preferences and growing concerns over energy and the environment, we selectively invest management resources into: (1) improving our ability to develop and supply high-grade steel products; (2) bolstering technology that facilitates the use of low-grade iron ore, coke, coal, and other raw materials and fuels; and (3) nurturing environment-oriented technology that underpins sustained corporate development. We are promoting an R&D structure that integrates basic research and application development and engineering.

R&D Organization

NSSMC’s approximately 800 R&D employees work in three core research centers—Futtsu in Chiba Prefecture, Aramagasaki in Hyogo Prefecture, and Hasaki in Ishikawa Prefecture—as well as in the Plant Engineering and Facility Management Center (Head Office) and R&D laboratories at steelworks across Japan. They make collaborative efforts for integrated research activities that encompass basic and fundamental research and application development and engineering. Our R&D capabilities feature six strengths: (1) comprehensive-ness and speed of development, facilitated by the integration of R&D and engineering; (2) an R&D network having locations in customer regions; (3) integrated solutions enhanced by Group companies’ products and technologies; (4) the ability to address environment-related concerns with solutions maximizing steelmaking processes; (5) collaboration between industry and academic institutions, overseas alliances, and even customers; and (6) an extensive portfolio of fundamental and platform technologies.

In April 2014, we began the process of optimizing our R&D organization. We clarified roles and functions of each R&D site and consolidated research teams working in the same research field but at various sites of the now-combined companies. Work in a given research field is now done at a single location. This reorganization is expected to maximize synergy effects. Moreover, an R&D laboratory was newly established at Kawasaki Works, in addition to laboratories in Muroran, Kunita, Nagoya, Hiroshita, Yawata, and Oita Works. We are promoting an R&D structure that integrates basic research and application development and engineering.

Positioning of R&D

NSSMC is one of the world’s largest steel companies, with a wide range of steel-making capabilities that extend from the production of raw materials such as iron ore and coke to the conversion of the iron to steel, followed by the processes of sheeting, forming, and finishing. We are committed to further developing the technical capabilities of this system to meet diversified societal needs. We plan to build two new research bases in the near future, one in the Chiba area and one in the Sendai area. We aim to have an R&D network that can respond to diversified societal needs in a timely manner.

R&D Planning Div.

R&D Laboratories

Research & Engineering Center (Futtsu)

Aramagasaki R&D Center

Hasaki R&D Center

R&D Laboratories at Steelworks

Plant Engineering and Facility Management Center (Head Office)

Praise from society: Recent prizes received

<table>
<thead>
<tr>
<th>Award</th>
<th>FY2015</th>
<th>FY2016</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Award</td>
<td>Excellence in Innovation Award (Production Process Category)</td>
<td>Ordering Award</td>
<td>Ordering Award</td>
</tr>
<tr>
<td>Special Award</td>
<td>21st Century Invention Award</td>
<td>21st Century Invention Award</td>
<td>21st Century Invention Award</td>
</tr>
<tr>
<td>Special Award</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
</tr>
<tr>
<td>Special Award</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
</tr>
<tr>
<td>Special Award</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
</tr>
<tr>
<td>Special Award</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
</tr>
<tr>
<td>Special Award</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
</tr>
<tr>
<td>Special Award</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
</tr>
<tr>
<td>Special Award</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
</tr>
<tr>
<td>Special Award</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
</tr>
<tr>
<td>Special Award</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
<td>Development of high-temperature resistance welding wire for stainless steel</td>
</tr>
</tbody>
</table>

NSSMC’s innovation—Introducing examples of our successful R&D outcomes

- **Exploit new functions of steel**
  - Steel that is easy to transform and process (1,180 MPa ultra high-tensile-strength steel with high formability)
  - Anti-corrosive steel (anti-corrosive galvanized steel sheet, SuperDynaTM*)
  - Steel that facilitates efficient use of energy and other resources (stainless tubes for ultra supercritical boilers)

- **Exploit new uses for steel**
  - Application technology that makes use of steel (high pressure technologies, 3DQ steels, pressing technologies NSafeTM-FORM)
  - Technology for predicting performance (New analysis techniques for automotive emission simulation)
  - Technology that assesses performance (drop impact test)

- **Exploit steelmaking**
  - Technology that enables visualization of the inside of a blast furnace (3D real-time visual monitoring technology for blast furnace operation)
  - Technology to make cleaner steel (technology to analyze and control liquid steel magnetic flow)
  - Technology to control evenness of cooling (Continuous online control process CLC-μ for steel plates)

- **Exploit various materials**
  - Titanium alloy that is light in weight, highly corrosion resistant, and easy to fabricate
  - Semiconductor mounting material that reduces rare-metal requirements (Copper bonding wire EX1*)

- **Exploit environmental technologies through steelmaking**
  - Next-generation coke-making technology (SICOP®) to realize the world’s highest energy efficiency
  - Technology to extract hydrogen from high-temperature gases of a coke oven through catalytic reforming
  - Technology to convert waste plastics to chemical raw material by use of a coke oven*

* Recent results received
INTELLECTUAL PROPERTY

Pursuing global utilization of intellectual property

One of NSSMC’s Management Principles is “pursue world-leading technologies and manufacturing capabilities.” The basis of our intellectual property (IP) activity is to secure technologies, including the newly created, most advanced ones, as IP and then to utilize the IP to meet our medium- and long-term IP strategy in line with our management/business strategies.

Priorities

The IP Division collaborates with the Business Divisions and the R&D Divisions to support the Company’s global strategies. We have been focusing on enriching and accumulating IP as “an effective leverage to compete in the world, and with the world” both in quality and quantity and use it as a ready-to-deploy “business tool.” By converting our advanced core technologies into IP and strategically utilizing them, we will continue to reinforce NSSMC’s competitive edge and pursue its global strategy more effectively, with the aim of becoming the world’s leading steelmaker with comprehensive strengths.

Specific Activities

Establishing a framework to avoid impairment of our IP and a basis for global utilization of our IP

I. ENHANCED ORGANIZATIONAL ACTIVITY

AS THE COMPANY’S FUNCTIONAL DIVISION

① Steady promotion of our IP mid-term plan
② Concerted efforts to enhance coordination with pursuit of advanced technologies and maximize our IP value

II. ENHANCED SUPPORT AND MANAGEMENT OF IP CREATING ACTIVITIES

① Sharing of strategies and enhancement of collaboration with overseas Group companies and IP partners (external experts)
② Strengthening of support for overseas invention and other IP creating activities

Promoting unified IP management as NSSMC Group

In collaboration with related divisions across the Group, we are promoting the acquisition of IP both in Japan and overseas, relating to various world-leading advanced technologies, such as products/manufacturing technologies and technologies for using diversified raw materials and for reducing environmental burden. Moreover, in order to establish a global business structure, we have been implementing mutual licensing of IP such as patents and know-how, and providing technical support to our strategic alliance partners and joint venture companies. This strengthens the competitive edge of the NSSMC Group as a whole.

Enhancement of IP compliance

From the viewpoint of respecting other companies’ IP rights, we conduct all of our IP activities in compliance with IP laws. At the same time, we engage in wide-ranging activities, from “utilization” to “information management,” with respect to NSSMC’s technology. We also strictly deal with any illegal use of our patents, corporate/trade name, trademark, and copyrights.

Receipt of a Thomson Reuters Top 100 Global Innovator Award for the Second Consecutive Year

Following the 2012 Award, NSSMC has earned a Thomson Reuters 2013 Top 100 Global Innovator Award, which is based on four principal criteria—overall patent volume, patent grant success rate, global reach of the portfolio, and patent influence as evidenced by citations. NSSMC was again the only company chosen from the global metal refining and production industry including steel.

NSSMC’s Three Eco-Friendly Initiatives

ECO PROCESS

THE WAY WE MANUFACTURE IS “ECO-FRIENDLY”

NSSMC manufactures steel products with world-leading resources and energy efficiency and is aiming to develop eco-friendly steelmaking processes by further improving efficiency.

ECO PRODUCTS™

WHAT WE PRODUCE IS “ECO-FRIENDLY”

We produce and offer eco-friendly “eco products™” using our world-leading technological capabilities, thus conserving resources and energy and thereby contributing towards building a sustainable society.

ECO SOLUTION

SHARING OUR “ECO-SOLUTIONS”

We contribute to the reduction of CO2 emissions and other environmental burdens on a global scale by diffusing our Group’s world-class environmental and energy-saving technologies in Japan and overseas.

DEVELOPMENT OF INNOVATIVE TECHNOLOGIES

Based on the objective of offering to society technologies and products that contribute to the saving of resources and energy and the reduction in environmental burden, we are developing innovative advanced technologies from a medium- to long-term perspective.
Environmental Initiatives

ECO PROCESS (THE WAY WE MANUFACTURE IS “ECO-FRIENDLY”)

We aim at reducing environmental impacts in our operations and manufacturing processes. We strive to efficiently utilize limited resources and energy at every stage of operations.

NSSMC’s steelworks are working rigorously to save energy in all manufacturing processes with the aim of reducing CO2 emissions. For example, we try to achieve (THE WAY WE MANUFACTURE IS “ECO-FRIENDLY”) 

Achievements versus the steel industry’s voluntary action plan

Change in energy consumption

Energy derived CO2 emissions

NSSMC internally generates 84% of the electricity it buys.

NSSMC supplies 43% of internally-generated electricity to the local community.

Top-pressure Recovery Turbine (TRT)

A blast furnace produces a massive amount of byproduct gases. The TRT is intended to utilize the massive exhaust pressure from the blast furnace of steel mills to generate electricity. It requires no fuel cost and generates no greenhouse gases, such as CO2. For example, at Kashima Works, approximately 10% of the electricity necessary is supplied by the electricity that is generated by this system.

Recycling of water

NSSMC's steelworks are working rigorously to save energy in all manufacturing processes with the aim of reducing CO2 emissions. For example, we try to achieve (THE WAY WE MANUFACTURE IS “ECO-FRIENDLY”) 

Adopted measures:

1. Efficiency improvements of equipment, higher combustion efficiency, and electricity savings.
2. Recycling of water for cooling or washing products and production facilities is recycled and reused.
3. Use of by-products such as steelmaking slag, blast furnace gas, and converter gas.

NSSMC internally generates 84% of the electricity it buys. NSSMC supplies 43% of internally-generated electricity to the local community.
NSSMC’s eco-friendly products help reduce environmental burden.

Our Group’s products, that have advanced or highly specialized functions, technical capabilities, and reliability, are used in diverse areas including energy, transportation and construction equipment, and household products. They typically help our customers become more efficient while making their products lighter or lengthening product life. That translates into the saving of resources and energy, and into a reduction in CO₂ emissions at the point of use at our customers, contributing to lessening the environmental burden.

**ENERGY-RELATED PRODUCTS**

Eco-friendly oil well tubular CLEANWELL™ DRY

Oil well tubulars are used in wells to produce oil or gas. As these wells can be as deep as 10,000 meters, tubulars are connected by threaded joints. Grease is normally used to lubricate the thread surface but it contains heavy metals, which may contaminate the surrounding environment. This is why NSSMC developed CLEANWELL™ DRY, a lubricant to be applied on the surface of threads. As it contains no grease, it does not damage the environment.

Steel materials for offshore wind power generation

NSSMC Group is participating in the world’s first offshore wind power generation project that uses a floating wind farm. In November 2013, a large wind turbine, 80 meters in diameter, began to generate 2 megawatts at about 20 kilometers offshore from Futakoshi Prefecture. NSSMC provides high-tensile lightweight steel with high-performance weldability for floating parts which are used in the harsh offshore environment. Supply of this material contributes to reduced CO₂ emissions in transportation and construction.

We have also developed and supplied materials for chains to connect the floating offshore wind turbine to its anchorage on the ocean bed. Our chain materials are durable against friction and corrosion in and on the ocean and help anchor the floating part in a harsh environment with no need of replacement for 20 years. Reducing the need for replacement and repair, which require large-scale construction work, contributes to the reduction of CO₂ emissions in transportation and construction and helps prevent climate change.

**PRODUCTS RELATED TO TRANSPORTATION AND CONSTRUCTION EQUIPMENT**

Electromagnetic steel sheet for high-efficiency motors

Electromagnetic steel sheet efficiently converts magnetic energy into electric energy by enhancing the property of the iron to convey magnetic lines of force. It is used to make the iron core of electrical equipment such as motors. This material has been in request to enable high power output and to efficiently convert electric energy to motive power. NSSMC’s electromagnetic steel sheet is used for fuel-efficient hybrid and electric vehicles (EVs); contributing to high performance in the vehicles (through improvement of fuel efficiency and high-speed rotation) as well as energy savings.

High-tensile-strength steel materials

Reduction in vehicle body weight is a top priority for automakers seeking improvement in fuel efficiency. This has to be achieved while also ensuring the safety of passengers in case of a collision. High-tensile-strength steel materials can overcome these challenges. The materials are used in various forms and applications as automobile parts. NSSMC has been the first in the world to develop and commercialize high-tensile-strength steel materials for automobiles that are not only strong but also superior in workability. Weight reduction of automobiles achieved as a result of efforts to improve fuel economy is another way that NSSMC contributes to the prevention of climate change.

Steel tire cord

Radial tires for automobiles use wires made of steel cords that are as thin as three human hairs. These cords help tires to retain their form and provide excellent reliability. NSSMC’s high-strength steel cord, the strongest in the world, helps to reduce the number of wires in a tire, thus contributing to weight reduction of tires. This is another way that NSSMC helps to preserve the global environment, through improved fuel efficiency.

Steel slag-based products

Beverly™ Unit is a fertilizer that supplies iron, which is needed to foster growth of seaweed beds in the ocean. Made up of iron slag units composed of steel slag, which is rich in iron, with soil and humus obtained by fermenting chips of waste wood, the Beverly™ Unit is put in a bag made of palm tree leaves and buried along the coast line, or is placed in an iron box and sunk on the sea floor. This supply of iron into the ocean helps to regenerate sea forests. The steel slag, a byproduct of the steelmaking process, is mainly composed of calcium and silicon and contains magnesia, iron, phosphorus, manganese, and boron, which helps plants to grow, and has long been used as fertilizer. Recently, the slag fertilizer has been used at a farm in the Tokelau region, which was damaged by the tsunami caused by the Tohoku Earthquake in March 2011. It has helped to recover the health of the farm soil and has proved to be an eco-friendly product that helps promote soil fertility.

Wheelsets (wheels and axles) for high-speed railways

NSSMC manufactures almost all wheels and axles for the shinkansen and other high-speed railways in Japan. The wheel- set assembly of a railway car is fitted to the axial driving mechanism of gear assembly, and is made up of rail wheel, brake disks, and is made to meet the strict quality standards and requirements of each user. We have continued development and improvement of this product based on our expertise and technology, while pursing weight reduction and thus contributing to energy conservation in railway transport. We have also developed technology to dampen the noise of meshing of a gear unit or hissing sound of brake disks.

Pure titanium sheet for aircraft and titanium alloy rods for aircraft engines

The use of high-strength, low-density titanium contributes to the reduction of weight in aircraft, thereby achieving higher energy efficiency. The Airbus A350 XWB and other advanced aircraft have improved fuel efficiency thanks to technological breakthroughs such as further weight reduction due to the use of new composite materials and the adoption of newly designed engines. As titanium is compatible with composite materials such as carbon fiber-reinforced plastic (CFRP), it can further contribute to making aircraft more eco-friendly. NSSMC supplies titanium alloy rods used in aircraft engine blades and pure titanium sheet used in pylons that connect wings and engines.

ABREX™ Series abrasion-resistant steel plate

The ABREX™ Series abrasion-resistant steel plate is 5-6 times harder than ordinary steel and wears out less. This durability is why it is often chosen for applications in construction machinery and mining equipment for civil engineering and mineral resources development, and for crushing machines used in the recycling of resources. By being used for dump truck beds and excavator buckets, the ABREX™ Series has contributed to post-earthquake reconstitution of the Tohoku region. The series is eco-friendly and features reduced-abrasion of the material, extension of the maintenance cycle of machinery, and weight reduction of the product where it is used.

**HOUSEHOLD-RELATED PRODUCTS**

Corrosion-resistant SuperDyma™ galvanized sheets

SuperDyma™, a high corrosion-resistant hot-dipped galvanized sheet, is used as a building material for frames for solar power generation and various other applications. Its coating is mainly composed of zinc with aluminum, magnesium, and silicon. Compared to conventional products, SuperDyma™ lasts four times longer and has tight protective coating film can be a quarter of the thickness of the material it replaces. In addition, after-coating and after-painting are unnecessary, as SuperDyma™ has high corrosion resistance on cut-end surfaces. As such, it saves painting costs, weight loss, and reduces CO₂ emissions in transportation and construction.

High-strength steel wires for suspension bridges

Galvanized steel wires are used for the main cables of long-span suspension bridges, such as the Rainbow Bridge in Tokyo. The suspenders supporting cables, 1,000 millimeters in diameter, are made of two tons of thousands of individual steel wires 5-millimeter diameter bound tightly together. Our high-strength steel wires for cables are used as the main cables of many long bridges that have been constructed at major straits in Japan and overseas. NSSMC is contributing to the prevention of climate change by supporting activities of daily living including traveling, and limiting CO₂ emissions in transportation and construction of bridges.

Hat-shaped steel sheet pile

NSSMC’s hat-shaped steel sheet pile, with its hat being the widest in the world, is used in various applications such as riverbank reinforcement, water channel reinforcement, port quay, road-rebuilding, shielding walls, and measurements to prevent liquefaction and sinking of riverbanks. The steel weighs 7% less than conventional U-shaped steel sheet piles, while the pile is 1.5 times wider. By reducing the number of piles pressed in the ground by two-thirds, the time needed for transportation and construction can be shortened and hence reduce CO₂ emissions, thereby contributing to the prevention of climate change.

Electromagnetic steel sheet

Electromagnetic steel sheet efficiently converts magnetic energy into electric energy by enhancing the property of the iron to convey magnetic lines of force. It is used to make the iron core of electrical equipment such as motors. This material has been the first in the world to develop and commercialize high-tensile-strength steel materials for automobiles that are not only strong but also superior in workability. Weight reduction of automobiles achieved as a result of efforts to improve fuel economy is another way that NSSMC contributes to the prevention of climate change.

Radial tires for automobiles use wires made of steel cords that are as thin as three human hairs. These cords help tires to retain their form and provide excellent reliability. NSSMC’s high-strength steel cord, the strongest in the world, helps to reduce the number of wires in a tire, thus contributing to weight reduction of tires. This is another way that NSSMC helps to preserve the global environment, through improved fuel efficiency.
Environmental Initiatives

ECO SOLUTION (SHARING OUR “ECO-SOLUTIONS”)

The NSSMC Group’s technologies help solve the environmental challenges of various countries throughout the world. We are cooperating in energy-saving and other environmental initiatives in China, India, and other parts of the world, as the international technical transfer of our superior energy-saving technologies is most effective in reducing CO2 emissions and in other environmental countermeasures on a global scale. In India, especially, we are actively participating in a feasibility study to design a bilateral offset credit scheme.

The NSSMC Group focuses on the development of technologies that help improve environmental burden substantially. Our technical transfer of our superior energy-saving technologies is most effective in reducing CO2 emissions and in other environmental coun-

- **Coke oven incorporating next-generation coke manufacturing technology (SCOPE21)**

  SCOPE21 is technology that was developed under a national project for the purpose of increasing the ability to overcome resource and energy issues. It incorporates various innovative technologies for reducing coke manufacturing time, improving the quality of coke, and so forth, and is expected to result in increased utilization of low-grade metallurgical coal and produce significant energy savings. Based on the assumption of the Ministry of Economy, Trade and Industry, if all existing coke ovens in Japan were replaced by this new type of coke oven by 2020, a reduction of approximately 310,000 kL/year (when converted into crude oil equivalent) could be achieved. The first SCOPE21-type coke oven has been operating at our OnWorks since its implementation in May 2008 and its favorable results have led to the construction and start of a second coke oven at our Nagoya Works in June 2013.

- **Environmentally harmonized steelmaking process technology (COURSE50)**

  We are working to develop revolutionary steelmaking processes aimed at large-scale CO2 reductions. The Japanese steel industry is already the lowest energy realized steelmaking processes that emit the least amount of CO2. Any further improvements in efficiency would require the development of a revolutionary new steelmaking process. Under contracts from NEDO, various steel companies are working to develop eco-conscious steelmaking process technologies. Among the projects being realized by the NSSMC Group and three other steelmakers, we are constructing a test blast furnace (to be completed by fiscal 2015) in the scale of 10m3 and will execute the test operation for H2 reduction development with the aim of realizing the COURSE50 processes. We are also working on the H2 magnification test from coke oven gas and the technological development to use exhaust heat (hitherto not utilized) during the process of separating and recovering CO2. Through these efforts, we strive to further develop our technology.

* COURSE50-CDQ: Ultimate Reduction III Steelmaking process by innovative technology for cool Earth III NSMC, Nippon Steel and Sumikin Engineering Co., Ltd., and the three other integrated steelmakers in Japan are carrying out this project with the aim of developing innovative process technologies that enable substantial reductions of CO2 in the steelmaking process.

---

Example of an “eco-solution” CDQ (Coke Dry Quenching)

CDQ equipment quenches red-hot coke (approx. 1,000°C) from a coke oven with inert gas. Compared to the conventional method of quenching with water, this method uses inert gas for cooling and generates power by collecting exhaust heat. It also generates little white smoke (steam) and scatters little dust. Moreover, it contributes to the stable operation of a blast furnace as the coke is strengthened. Nippon Steel and Sumikin Engineering in the NSSMC Group has constructed about 100 units of CDQ in Japan and overseas, contributing to the saving of energy and enhancement of environmental measures in China, India, and other emerging countries.

![CDQ equipment](image-url)
TOGETHER WITH CUSTOMERS

Through the provision of total solutions, we have built relationships of trust with customers, which has become one of our strengths.

In general, steel products are processed at the final stage by customers. NSSMC does not simply sell products to customers but instead provides total solutions, including processing technology, from the viewpoint of our customers. By supporting customers when they solve problems, we contribute to the improvement of their product quality. Such efforts have been accumulated so as to result in strong long-term relationships of trust with customers, which has become a precious asset for us.

**Example of a solution: High-tensile steel sheets for automobiles**

High-tensile steel sheets for automobiles are required to satisfy the need for weight reduction to raise fuel efficiency and the need for vehicle body stability. The steel sheets must be both thin and strong, making them difficult to manufacture. We propose to our customers a trinity of solutions—materials, manufacturing methods, and designing. For example, we may propose a forming method that matches the specific features of each customer’s facilities and techniques. In addition to such “before service” activities, we may provide “after service,” by which our engineers regularly visit customers’ manufacturing sites, bring back the “voices of customers” to their own workplaces, and thus ensure further improvement in developing steel materials. By enhancing cooperation with customers and maximizing performance of steel materials, we contribute to the manufacturing of safe, reliable, and eco-friendly vehicles.

**Seek to be No. 1 in customer satisfaction**

The relationships of trust with our customers and their satisfaction, which we have gained by providing products and services based on the customers’ viewpoint, are our valued assets. We will seek to ensure that our customers say “only NSSMC can do this,” in keeping with our aim of being the No. 1 steelmaker in terms of customer satisfaction.

**Received the highest-ranked Best Partner Award from Panasonic Corporation for a third consecutive year**

NSSMC received from Panasonic Corporation the Best Partner Award in November 2013. We have been recognized as having greatly contributed to the enhanced strength and appeal of Panasonic products—through the provision of proposals on new materials and various manufacturing methods—that have further strengthened our long-term business relationship. We are the first company to receive the award for a third consecutive year. NSSMC also received Gold Awards for ECO-VC (Value Creation) Initiatives for five consecutive years, including the use of high-corrosion-resistance galvanized SuperDyma™ which enabled the world’s first uncoated air conditioner outer unit. The ECO-VC awards are given to suppliers that make particularly significant contributions to energy savings and value creation (or raising product values). The ECO-VC awards were given to NSSMC for a fifth consecutive year. In 2013, we were awarded out of as much as 1,100 applications that were submitted by suppliers of Panasonic Group companies.

TOGETHER WITH EMPLOYEES

The first step toward world-leading technologies and manufacturing capabilities is to develop a great workforce.

NSSMC’s growth strategies include the utilization of advanced technologies and an affirmative approach to globalization. While this may appear all too obvious, such initiatives can only be realized by our own people. The NSSMC Group helps develop each and every employee and combine their power with the corporate aim of becoming the world-leading steelmaker. NSSMC respects human rights, gives due attention to the rights of workers, and staunchly opposes the use of forced and child labor. These are prerequisites of our corporate activities. We have also prohibited as unjust the discriminatory treatment of workers, and take such initiatives as holding conferences for human rights enlightenment on a regular basis. In addition, we give careful consideration to the traditions and culture of each country as we accelerate overseas business development.

**Training employees to support business expansion in overseas growth markets and technological innovation**

With the aim of fostering people who can work on a global stage, we have established and carried out a range of educational activities that includes language lessons, intercultural learning programs, overseas assignment, and overseas study programs. It is also important to hire and invest in engineers who will lead us in the advancement of our technological edge. As such, there are various specialized technological training sessions for these engineers.

**Skill transfer and constant hiring support for our sustained growth**

Our veteran employees are relaying their accumulated skills and know-how to the next generation of young workers in our manufacturing workites. The merit of transferring skills has been evolved by such systemized teaching methods as visualized work procedures and comprehension tests.

**Respect human rights**

NSSMC respects human rights, giving due attention to the rights of workers, and staunchly opposes the use of forced and child labor. These are prerequisites of our corporate activities. We have also prohibited as unjust the discriminatory treatment of workers, and take such initiatives as holding conferences for human rights enlightenment on a regular basis. In addition, we give careful consideration to the traditions and culture of each country as we accelerate overseas business development.

**Diversity in human resources**

12,500 people of diverse backgrounds are working at approximately 80 overseas bases of the NSSMC Group. In Asia, the Americas, and elsewhere, NSSMC employees are working together with local employees and joint venture partners. As well, in many of our companies we have more female employees in important positions than in the past, even at manufacturing workites.
Together with Employees

Safety and health at work are of the utmost importance

“Safety and health of employees at the Nippon Steel & Sumitomo Metal Corporation Group are the most important, top-priority values and the basis for supporting business development.”

“Under the Management Principle of ‘developing and bringing out the best in our people,’ the NSSMC Group makes continuous efforts to ensure the safety and health of the people who work for the Group and continues to contribute to society through the safety and health of the employees as well.” In keeping with the Basic Philosophy on Safety and Health, we uphold activities with the aim of eliminating serious injuries. We also work at making our equipment genuinely safer as one way of improving worksites. We carry out measures to prevent human errors. Also, we are establishing a system to promptly and widely inform our people of good examples of disaster prevention initiatives. These are just some of the ways we seek to ensure the safety and health of employees. As for training on safety, our TAIKAN Program (experience-based safety education program) which enables employees to experience risk at their worksite through simulation, to thereby better prepare them for anticipating and managing risk, has been enhanced. As for healthcare management, we have improved health guidance to employees and continuously urge early detection and appropriate handling of mental health issues of employees.

Creating an employee-friendly environment

From the viewpoint of supporting the work of various employees and realizing a balanced way of work and living, we have also offered various welfare benefit programs that accommodate the needs of employees. These include dormitories, company housing, and the “work-life support program,” which allows each employee to choose options for leisure, child support, etc.

Corporate governance structure

NSSMC’s Articles of Incorporation stipulate that, as a corporate governance structure, the Company shall have a Board of Directors and not more than 20 Directors as well as an Audit and Supervisory Board and not more than 7 Audit and Supervisory Board Members, and accounting auditors. Based on that article, 14 Directors (including 2 Outside Directors), 7 Audit and Supervisory Board Members (including 4 Outside Audit and Supervisory Board Members), and one accounting auditor are elected at present.

NSSMC’s Board of Directors, which is comprised of Directors with thorough understanding and experience in its businesses and Outside Directors having independent positions, adequately and swiftly makes decisions regarding the Company’s important business activities and oversees the execution of duties by Directors. The Audit and Supervisory Board Members, who hold legally strong auditing authority, are required to maintain independence and independence when overseeing the execution of duties by Directors and enhance the oversight function of the management. NSSMC believes that this structure ensures efficiency and fairness in management and is effective for the Company to achieve sound and sustainable growth. Therefore, NSSMC has adopted the corporate system form of organization with an audit and supervisory board. In addition, to clarify responsibilities for the results of each business unit and division, the Company has introduced an executive officer system under which executive officers strive to ensure the proper execution of business activities.

Directors and Audit & Supervisory Board Members

Based on internal rules, executive decisions on key issues that may affect the activities of NSSMC and the NSSMC Group are determined by the Board of Directors, which convenes once or twice a month, after such matters have been discussed by the Corporate Policy Committee, a group that includes participation by the Chairman, the President, Vice Presidents, and other members and that normally meets once a week. In addition, NSSMC has set up 17 Companywide committees, each with its own objective, where details on designated themes are hashed out before the Corporate Policy Committee, and the Board of Directors embark on decision-oriented discussions. At present, NSSMC’s Board of Directors comprises 12 Directors in charge of execution of duties and 2 Outside Directors. Outside Directors, who have vast experience and deep insights in corporate management, international relationship, and other fields, are expected to contribute to decision making from diverse perspectives on NSSMC and enhancing the overseeing function of management, by proactively providing their opinions and exercising voting power from their independent status at the Board of Directors and other meetings. The present Audit and Supervisory Board comprises 3 full-time Audit and Supervisory Board Members and 4 Outside Audit and Supervisory Board Members. The Outside Audit and Supervisory Board Members, who have vast experience and deep insights in fields such as legal affairs, accounting, financials, and corporate management, proactively provide their opinions at the Board of Directors, the Audit and Supervisory Board, and other meetings and perform auditing activities including research on corporate operations and status of assets. They thus contribute to NSSMC’s sound and fair management.

The Company has notified Japanese bourses on which its stock is listed of the designation of Outside Directors and Outside Audit and Supervisory Board Members as independent directors and auditors, pursuant to the Securities Listing Regulations of these bourses. All these bourses have accepted the Company’s notifications of all independent directors and auditors.

Prompt and appropriate execution of business strategies

The execution of business strategies mandated by the Board of Directors and other executive structures is promptly addressed by the Directors responsible for these businesses, other executive officers, and the general managers of relevant units and divisions, under the direction of the Representative Director and Chairman, as well as the Representative Director and President. These actions are accomplished by stipulating in writing the ordering authority, oversight responsibility, and procedures required to implement strategies.
Internal controls and risk management system

NSSMC resolves the Basic Policy concerning Internal Control System at its Board of Directors’ meeting and stipulates its Basic Rules for Internal Control for establishing a system for internal controls and risk management.

• NSSMC establishes an annual plan on internal controls and risk management and acts accordingly.
• It regularly confirms the status of internal controls and the risk management system through the Risk Management Committee, chaired by the Executive Vice President in charge of Internal Control & Audit.
• Each division of the Company designates a person in charge of risk management, while each Group company designates a person responsible for risk management. This is to encourage each division and company to take initiatives and share information about risk management among the Company and Group companies through regular meetings and other means.
• NSSMC regularly checks the Groupwide status of internal controls by establishing measures to check and supervise matters related to internal controls and risk management.
• NSSMC has set up a whistleblower system—namely, the Compliance Consulting Room within the Company and the Compliance Hotline run by the Company’s attorney—as a conduit for communication, to handle risk-related concerns among Group employees, staff of purchase agreement companies, and other Group employees regarding the execution of operations. This helps prevent accidents and the violation of laws and regulations preemptively and also improves operations.

Compliance education

“We continue to emphasize the importance of integrity and reliability in our actions.” This is the first principle we stated in the Management Principles. Through messages from top management, periodic legal training programs, and other activities, we make certain that all employees fully understand NSSMC’s basic policy of ensuring fair management.

In particular, in order to ensure full compliance with the Antimonopoly Act, the Company has designated every December as the “Antimonopoly Act Compliance Campaign Month.” Specific activities conducted in December every year include: to hold seminars to all sales and marketing personnel who receive a strict order from the President to prevent the recurrence of violations; to thoroughly inform and implement the “guideline to prohibit contact with competitors”; and to regularly check the status of implementation of the guideline every year.

In addition, we have prepared “30 Don’ts of Business Behavior,” a set of compliance guidelines that include simple examples of violations of the Antimonopoly Law and other laws governing business activities, “Guidelines to Prevent Sexual and Power Harassment in the Workplace,” and “Anti-Bribery Guidelines” to prevent bribery to government officials. These original written materials are designed for our employees to conduct fair and appropriate business. We also conduct educational programs and e-Learning programs for each rank, to cultivate a strong awareness of these guidelines and the importance of complying with laws and regulations among everyone at the NSSMC Group.
Quality management

NSSMC’s long-accumulated efforts for quality assurance have resulted in obtaining the trust of customers and what we perceive as unrivaled competitiveness and have contributed to the sustaining and further raising of our corporate value. In addition to complying with laws and regulations, all of our employees engaged in manufacturing and services are also involved in enhancing quality assurance measures such as adhering closely to those specifications of products related to quality assurance.

Specific initiatives for quality assurance

A team has been set up for all Group companies including those overseas to undertake quality monitoring with the aim of discovering and eliminating potential risks. At the same time, autonomous quality enhancement activities are conducted at our manufacturing sites. Anecdotal information is promptly and widely shared within the Group, and we make sure to address the identified issues by standardizing or systemizing ways to enhance and assure quality and to carry out needed capital spending. We also provide quality management education programs at all companies and steelworks to raise awareness and knowledge of all Group employees. Furthermore, we have received certifications from external institutions such as for ISO 9001 and Japanese Industrial Standards (JIS), which helps to further boost credibility of our quality assurance system. Based on this solid, world-class, quality management structure, we are making efforts every day to raise our customer satisfaction level as well as the credibility of our brand.

Environment management

While NSSMC has supported Japan’s industrial development, we realize that we also have a significant impact on the environment in our business activities, as we account for approximately 5% of Japan’s overall energy consumption. NSSMC and all its Group companies are tackling environmental management based on its “Environmental Basic Policy,” which has Groupwide comprehensive environmental management as its core.

Environmental management system

Constructing a groupwide system for environmental preservation activities

NSSMC’s Environmental Management Committee convenes every half year and spearheads environmental management. Air, wastewater and industrial waste are emphasized as important environmental risks to manage and the Groupwide periodic conference for each of those risks is held for further improvement. In addition, the Group Companies Environmental Conference convenes twice per year, so that information is shared with Group companies. We have established a scheme to focus on a specific environmental risk and strive to ensure environmental preservation.

Through internal environmental supervision, internal control interviews with Group companies in Japan and overseas, and other measures, we check and follow up on the environmental status effectively using the plan–do–check–act (PDCA) system.

Information security

Compliance with information management rules

NSSMC has rules governing information management and several implementation rules for the purpose of controlling and managing information as valuable assets. Among their functions those rules provide protection to prevent infringement of third-party confidential information.

Measures to prevent leakage of confidential information

- NSSMC constantly strives to enhance the security level of the IT systems it uses, and to take effective measures against unauthorized access and computer viruses.
- Technical presentations and technology licenses are required to undergo prior internal review to prevent unintentional disclosure of confidential information.
- NSSMC classifies its facilities based on level of criticality and limits entry to those facilities according to that classification.

Protection of personal information

NSSMC has rules for the proper handling of personal information.

Education on information management

- NSSMC provides a “Manual for Protection of Confidential Information” to all employees.
- NSSMC uses appropriate opportunities to inform employees of the importance of protecting confidential information, rules, and practical matters for management of information.

Protection of intellectual property

Intellectual property risk management

We aim to implement intellectual property (IP) activities organizationally, respect other companies’ technologies, and maximize the values of our proprietary technologies. For those purposes, we constantly promote proper information management, prevent violation of IP-related laws and regulations, manage IP risks by expanding the scope of Groupwide IP activities, and reduce risks associated with our overall IP activities by enforcing our internal rules.

Efforts for the protection of IP

We continuously acquire and utilize IP rights on technologies sustaining our technological edge, and eliminate counterfeits that infringe our IP rights. At the same time, we respect the IP rights of other companies, and conduct necessary investigations to avoid any infringement. We also carry out IP training each year to enhance the understanding and awareness of our employees.
Communication with local communities and society

Having a long history of managing steelworks all over Japan, NSSMC has been rooted in local communities and supported by local residents. In accordance with our attitude of maintaining harmony with local communities and society, we have implemented distinctive social contribution programs. These programs include promoting the “Creation of a Hometown Forest” by planting trees and plants in communities, musical activities with its core base at Kioi Hall, and contribution to local communities through various sports.

“Creation of a Hometown Forest”

Each of NSSMC’s steelworks all over Japan has its own environmental conservation forest. Taken together, these silvicultural activities are our “Creation of a Hometown Forest” project which has been carried out under the guidance of Dr. Akira Miyawaki, director of the Japanese Center for International Studies in Ecology (and professor emeritus at Yokohama National University). This project seeks to research the natural vegetation inherent to a certain area, carefully select suitable trees, grow their saplings in pots, and have them planted in prepared locations by both local residents and our employees. The project first began in 1971, when we planted saplings at Otta Works, and has continued to this day. At present, our forests in aggregate total around 900 hectares (about the size of 190 Yankee Stadiums) and have grown to become home to a diverse range of birds and small animals, as well as contribute to the prevention of climate change.

Supporting culture and arts through musical activities

NSSMC has supported artistic and cultural activities for many years. A wide variety of activities are primarily conducted by the NSSMC Arts Foundation and include classical concerts by the Kioi Sinfonietta Tokyo chamber orchestra, which is based at Kioi Hall (Chiyoda-ku, Tokyo), Japanese traditional music concerts in a dedicated Japanese-style music hall within the Hall, and the ceremony for the presentation of the Nippon Steel & Sumitomo Metal Music Awards. The NSSMC Mixed Chorus has achieved a formidable record by winning the 27th Consecutive Gold Award for the Choral Competition in Japan.

Providing education on manufacturing and the environment

NSSMC hosts a number of programs nationwide to help young children and students—on whose shoulders the future rests—to better understand steelmaking and learn about the importance of manufacturing and the wonders of science and technology. Activities include a hands-on steelmaking program using the tatara method (a traditional Japanese ironmaking technique). For elementary and junior high school students, we help support an energy conservation and environmental protection class and conduct science experiments and special classroom lectures.

Communication with shareholders and investors

NSSMC is actively engaged in activities to enable our shareholders and investors to better understand our business strategies, philosophies, and manufacturing sites. We have an extensive IR program. We hold results briefings for institutional investors and analysts; publish a reporting booklet and an annual report for shareholders; maintain an Investors Relations section on our website; conduct investor surveys; and offer business briefings and tours of our steelworks for shareholders.

In addition, we have various benefit programs for our shareholders, such as invitations to J1-League football games of the Kashima Antlers football team and concerts at Kioi Hall, and we also give the Company calendar to our shareholders.

We will continue to work on ways to provide timely and useful information and improve our IR activities by increasing interactive communication with shareholders and other investors.

Through these activities, we hope to give investors many reasons to continue owning our shares. For more financial information about NSSMC, please visit the Investor Relations section of our website: www.nssmc.com/en/.

<table>
<thead>
<tr>
<th>Event</th>
<th>Summary of program</th>
<th>Period of implementation</th>
<th>Applicable shareholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invitation to plant tours (by lottery)</td>
<td>Shareholders are invited to a tour of our steelworks and manufacturing sites (plant tours are conducted at 4-5 steelworks and other plants twice a year, in the spring and in the fall. Eligible shareholders are asked to apply by selecting one of these plants)</td>
<td>Twice a year (October-November and March-April)</td>
<td>Shareholders who own 10,000 or more shares as of the end of September and March</td>
</tr>
<tr>
<td>Invitation to business briefings (by lottery)</td>
<td>Business briefings are conducted in Tokyo, Osaka, and other locations</td>
<td>Twice a year (July-September and February-March)</td>
<td>Shareholders who own 10,000 or more shares as of the end of September and March</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Events</th>
<th>Event</th>
<th>Summary of program</th>
<th>Period of implementation</th>
<th>Applicable shareholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invitation to football games of the Kashima Antlers (by lottery)</td>
<td>Shareholders are invited to J1-League football games (home and away)</td>
<td>Twice a year (March-August and August-December)</td>
<td>Shareholders who own 5,000 or more shares as of the end of September and March</td>
<td></td>
</tr>
<tr>
<td>Giving our the Company calendar</td>
<td>NSSMC’s calendar is sent to shareholders</td>
<td>Once a year (late November to early December)</td>
<td>Shareholders who own 1,000 or more shares as of the end of September and March</td>
<td></td>
</tr>
<tr>
<td>Invitation to concerts at Kioi Hall (by lottery)</td>
<td>Shareholders are invited to periodic Kioi Sinfonietta Tokyo concerts and other concerts</td>
<td>Twice a year (June-July and September-February)</td>
<td>Shareholders who own 50,000 or more shares as of the end of September and March</td>
<td></td>
</tr>
</tbody>
</table>