

Traffic Safety Concept Unique to SUBARU

—For Zero Traffic Accidents—

In today's increasingly car-dependent society, traffic safety is an ever present issue with increasing social interest. Here, we provide a glimpse of SUBARU's involvement in reducing traffic accidents, a responsibility undertaken as a vehicle manufacturer.



Traffic Accidents in Japan and SUBARU's Safety Concept

The number of deaths in traffic accidents in Japan has been declining for years, but the number of accidents still remains at a high level. In FY2010, traffic accidents totaled more than 720,000. Taking a look at these incidents by type of accident, rear-end collision and frontal collisions are most numerous, accounting for about 60 percent of the total (Figure 1). Analyzing accidents by hazard perception speed (the speed when the driver of a vehicle recognized the hazard), many accidents happened at 50 speeds of km/h or lower. (Source: Statistics on Traffic Accidents Situation in FY2010" by Traffic Bureau of the National Police Agency.)

SUBARU has been involved in vehicle manufacturing out of our desire to provide people everywhere with assured and pleasant driving. In the process, the "pursuit of safety" is one of the most important concepts and the "SUBARU all-around safety" which underlies the idea protecting drivers from any danger from any direction is what SUBARU set out to pursue. This encompasses "active safety" which prevents an accident from happening by anticipating a possible accident, "pre-crash safety" which comes to function before colliding to alleviate accident injuries and "passive safety" which minimizes damages in case of an accident.

Traffic Accident Prevention Technology "EyeSight (Ver.2)"

The "EyeSight (Ver.2)" is a driving assist system for drivers under a variety of situations by monitoring objects ahead with the world-first stereo camera that functions the same way as human eyes.

Advance Driving Assist Function of EyeSight (Ver.2)



The World's first *1

Collision avoidance and damage reduction function
Pre-crash braking

The moment the system has judged that there is a impending danger to impact against another vehicle or a pedestrian, it warns the driver and automatically applies the brakes if no collision-avoiding action has been taken, to avoid impact or reduce damage.

Only One in the World *2

Collision avoidance and damage reduction function
Control to Prevent Unintended Startup of Automatic Vehicle

When an obstacle is detected in front or when the accelerator has been pressed while standing still or moving at a reduced speed, the system suppresses engine output to moderate the vehicle's forward movement, while calling the driver's attention with warning sounds and meter indication.

The Highest Deceleration in Japan *2

Driving Strain Reduction Function
Full Speed Range Adaptive Cruise Control

The system enables a car to follow the vehicle in front throughout the whole vehicle speed range from 0 to 100 km/h. When the vehicle in front stops, the system brings the car to a stop without any manual braking. The car also can be restarted at the flick of a switch. It significantly reduces stress in pedal operation.

*1 Pre-crash braking system in full speed range. (by internal examination)

*2 At the end of May 2010 (by internal examination)

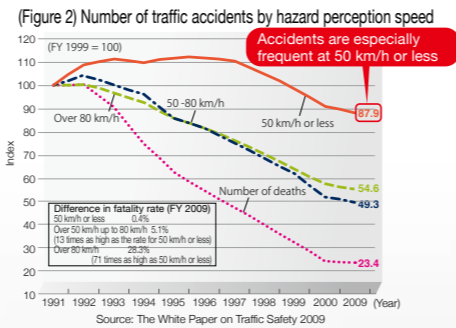
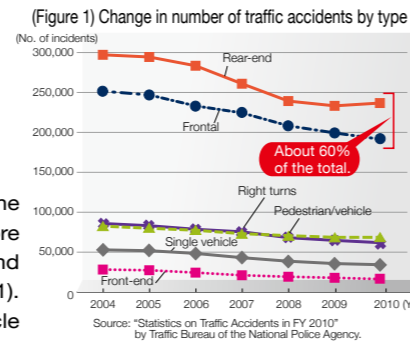


Image from the Stereo Camera

Interview of "EyeSight" Development Engineer Interview

We Chased After a Collision-free Vehicle

Technology Born out of Aspiration for Accident Prevention

"Pursuit of safety" is a mission of SUBARU where we are all devoted to vehicle manufacturing with a strong commitment to providing customers with "enjoyment and peace of mind." So far, we have established technologies related to "preventative safety" such as ABS (Anti-lock Braking System) and VDC (Vehicle Dynamic Control) and "impact safety" as exemplified by air bags which minimize damage in case of an accident. However, accident prevention and making cars collision-free are the most important steps to drastically reduce the number of traffic accidents. With this belief, we proceeded with developing the "EyeSight" by analyzing various accident reports and listening to our customers and dealers.

Pursuit of Technology to Prevent Traffic Accidents

Analysis of traffic accidents often leads to focusing on accidents associated with cognitive behavior, such as accidents at speeds of 50 km/h or lower (Figure 2) and accidents caused by inadvertent application of the accelerator instead of the brake. The "EyeSight" system offers "pre-crash safety" with the world-first stereo camera which compensates for cognitive and judgment mistakes to avoid collisions and alleviate damage. SUBARU successfully realized this function ahead of others because of its accumulated research work. Functioning like the human eye, the stereo camera can identify whether a perceived road obstacle is a vehicle or man and figure out the precise distance to the point of collision. SUBARU became the first car maker to establish the technology of on-board stereo cameras after investing 10 years prior to product commercialization. We went through repeated setbacks even after the first release, but our uncompromising efforts in this technological development finally bore fruit. The "EyeSight (Ver.2)" was thus put on the market. In fact, we



almost threw in the towel once, but managed to brace ourselves with strong determination as a car manufacturer that we had to get this technology finished for prevention of accidents. I now recall such challenging days. The dedication, I believe, of many engineers to this technological development and their strong sense of commitment lie behind the birth of the "EyeSight."

"EyeSight" to More Drivers

Such tickling remarks as "If you are looking for a car for your family, I would recommend an "EyeSight" equipped car" are heard more often than before. Since it is important to get the function of the "EyeSight" correctly understood to get the most out of it, I would like to get the points across to more drivers through campaigns for traffic safety promotion and test drive events. Meanwhile, I would like to further ramp up "EyeSight" and other technologies to cope with accidents other than rear-end collisions: thus, developing a "car closer to being really collision-free." I also would like to get myself involved in realizing a car society where people feel richer, safer and more relaxed.



Manager, Electronic Product Design Department

Mamoru Sekiguchi

Deputy General Manager, 3rd Vehicle Research & Experiment Department

Eiji Shibata

Traffic Safety Promotion Activities

SUBARU is engaged in offering education to local communities and employees on traffic safety for its promotion toward a safe car society.

For details, please refer to the section on Social Report and the Site Report.

Community-oriented Approach



Traffic Safety Activities at Utsunomiya Manufacturing Division
▶ P33



Speeches at Study Meeting of Young Driver Safety Club
▶ P33



Lectures on Traffic Safety at SOA
▶ P35

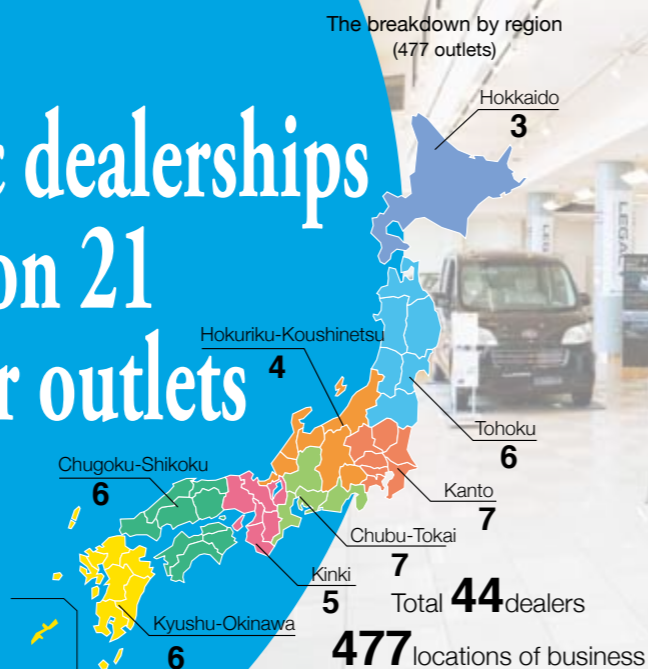
For Zero Traffic Accidents by Employees



Traffic Safety Guidance Offered to Employees
▶ P31

All SUBARU domestic dealerships obtained the Eco-Action 21 certification at all their outlets

The SUBARU domestic dealerships of Fuji Heavy Industries Ltd. obtained the Eco-Action 21 certification at all dealerships and their outlets in March 2011. This is the first-ever event in the industry that a whole maker-affiliated group got all their members certified. In this report, we will introduce their approach to acquiring the Eco-Action 21 certification to bolster their environmental management system.



Background behind the Dealers' Acquisition of the Eco-Action 21 Certification

SUBARU dealers had been doing their part in day-to-day operations through their own voluntary management systems to protect the environment in local communities where their customers live.

We declared "clean dealers" in the 3rd Voluntary Plan for the Environment to systematize the management, under which we planned and started supporting dealers to introduce the Environmental Management System (EMS: ISO etc.). First, we studied ways to operate in a unified manner instead of individual approaches in the management of environmentally burdensome oils and grease as well as the waste from and energy used for business activities. Since corporate size, the level of experience and knowledge differ from dealer to dealer, we had to establish unified standards for optimization from a legal point of view and work out various procedures to deal with legal requirements.

Their individually managed methods were reviewed for replacement with a more centralized management system to operate more efficiently. With such groundwork in the backdrop, we went through reviewing the existing plan and came up with the 4th Voluntary Plan for the Environment (FY2007). Under the plan, we decided to bring in the Eco-Action 21 (EA21 hereafter) which is the environmental management system formulated by the Ministry of the Environment. Also by adding legal compliance, meeting regulations and daily management by dealers to the environmental conservation through the system and reorganizing knowledge and operational methods nationwide necessary for unification of management standards, we intended to endorse regional preservation comprehensively for stable management of business.

Flow until Acquisition of the Certification

This approach aimed not only to systematize our operations, but also to help make right business decisions by ①identifying problems through third-party review, ②responding more timely to outside developments and revised regulations and ③centrally grasping our internal status. In addition, the certification acquisition was positioned to serve a role in the education of employees.

In March 2011, the acquisition of the certification by all dealers and their outlets was completed across the board. Among car-maker affiliated dealer groups, the SUBARU dealer body was the first to get this job done.

With the completion of certification, the Environmental Management System (EMS) is in place at all phases of manufacturing (ISO 14001) and sales (the Eco-Action 21). We will keep fulfilling our corporate social responsibilities including our commitment to the environment.

Realizing "Clean Dealerships" as the Whole SUBARU Team

We encouraged and supported SUBARU dealers to step up their environmental management for acquisition of the Eco-Action 21 by observing Fire Defense Law in handling oils and grease, the Water Pollution Prevention Act and the Waste Management and Public Cleansing Law. They also made it their practice to clean the vicinity of their facilities to serve local communities. These efforts paid off with the certification acquisition by all the dealerships at all their outlets by March 2011.

This approach to environmental preservation by leveraging the certification system is important for the SUBARU team to fulfill our social responsibilities, which will lead to the augmentation of the trust in the SUBARU brand that offers enjoyment and peace of mind.

The whole SUBARU team will continue to tackle with global environment issues to give a specific shape to "Clean Dealership" which is uplifted in our environmental policy.



SUBARU Japan Sales & Marketing Division Chief General Manager

Masami Iida

Flow until Completion of Introducing the Eco-Action 21

May 2008	Review of the system for environmental conservation.
June 2008	PRTR (Review of Law concerning Pollutant Release and Transfer Register / PRTR: Grasping the status nation-wide).
July 2008	Study of management method by EMS→Preparation of forms for managerial operations.
July 2008	Introduction of the EA21 decided→Study of supporting dealers and drafting the basics of EMS.
August 2008	Selection of a model dealer for acquisition: TOKYO SUBARU INC. started work for certification.
From September 2008	SAITAMA SUBARU KK, HIGASHI SHIKOKU SUBARU Inc. and SHIKOKU SUBARU MOTOR Co., Ltd. followed suit.
January 2009	TOKYO SUBARU acquired the certification. (The first acquisition)
	In 2009, 7 dealers acquired 7 certifications at 110 outlets. * Widely integrated certification (umbrella-type certification) system introduced.
	In 2010, 37 dealers acquired 11 certifications at 367 outlets. * In December, the Chugoku-Shikoku regional integrated certification system introduced.
March 2011	All 44 dealers acquired 23 certifications. at 477 outlets.

Close Up

Acquisition of the Eco-Action 21 by SUBARU Group in Kinki Area

In December 2010, the SUBARU group in the Kinki Area (OSAKA SUBARU, HYOGO SUBARU, KYOTO SUBARU and SHIGA SUBARU) secured the Eco-Action 21 accreditation "to contribute to formation of a recycling society." It took 6 months from the decision at a group management meeting until the certification acquisition. We interviewed those people involved in the Eco-Action 21 accreditation process to hear how they came to bring about the Environmental Management System (EMS hereafter).

Self-motivated Voluntary Environmental Activities

The SUBARU group in the Kinki Area took dealing with environmental issues while promoting sales of SUBARU vehicles and providing services as its first responsibility, and decided at the end of May 2010 to work toward Eco-Action 21 certification. It was necessary for the 4 member companies to work together to achieve EMS within a short period of time. While all the presidents and the heads of sales of the group got themselves oriented in the same direction through management meetings, a secretariat office was set up at OSAKA SUBARU to promote the Eco-Action 21 accreditation.

Amid the rush of demand for new cars before the termination of the "eco-car subsidy system" last summer, it was rather tough to follow through with environment-related jobs. But, thanks to the enthusiastic guidance of the promotional office and the cooperation of all member dealers, we managed to get the certification in December. We received positive reactions from customers who noticed the "Eco-Action 21" accreditation printed on our business cards, saying "Oh, you are also working on environmental issues." This is now a source of pride for our employees.

To protecting the environment requires each that each staff member understand why they do this or that and act in a self-motivated manner. Taking every opportunity to let customers know our involvement will lead to growing trust in our company as well as SUBARU vehicles. We will consolidate our system by rotating the PDCA circle and fulfill our mission as a corporate citizen through the concerted efforts of all the group members.



OSAKA SUBARU Co., Ltd. President

Makoto Hata

Getting Environment-consciousness Thoroughly Rooted by Inspecting All Points of Business

The issue we faced in promoting the Eco-Action 21 was to get EMS adopted at worksites in a short time. OSAKA SUBARU had already secured the ISO 14001 certification, but the other three had to start from scratch when it came to the environment. Under such circumstances, we went to 75 points of business and made the heads and service managers of these shops who are responsible for EMS implementation aware of the importance of accreditation and explained how the system works. At the same time, we investigated the status of handling industrial wastes and hazardous materials to identify points for improvement. I guess the facilities might have felt they were being forced at first, but through repeated discussions their attitudes turned positive and improvements appeared of their own initiative.

A "portable EA21 card" was prepared to make each person play his or her part in a responsible manner. Filling one's own environment-related targets in the card has more or less helped them take self-motivated actions.

In the future, we will promote the EMS while working to achieve targets related to our line of business such as selling 4-star cars and clean running engines.



EA21 Promotion Office, General Manager of Administrative Department in charge of environmental management, OSAKA SUBARU Co., Ltd.

Toru Yamamoto

Corporate Executive Vice President Chief General Manager, Business Development Promotion Division, OSAKA SUBARU Co., Ltd.

Katsuhiko Inoue

Comments by EA Consultants

An implementation system has been firmly established for the certification acquisition and the EMS has smoothly been infiltrated into the organization. We would give them due credit, especially for making round visits to the 75 points of business and putting into practice the portable card system. The reaction for improvements was fast indeed. We are looking forward to their continued involvement to positively impact their companies and local communities through unending creative efforts while rolling the PDCA circle.



Eco-Action 21 Auditor, eeohOM Representative

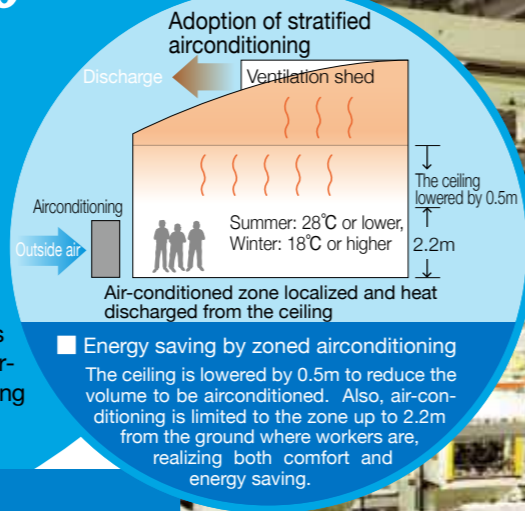
Shuji Hattori

Eco-Action 21 Office, Director of Osaka Technique-Promoting Engineers Association

Noriyuki Sekikawa

A new plant which is "environment-friendly" and "resilient to change" was born

A new horizontally opposed engine balances both environmental performance and driving performance at a high level. As its production site, the fifth plant was born on the premises of Oizumi Plant of Gunma Manufacturing Division in July 2010. The plant is designed and built to enable high-mix flow production, a top class environment-conscious plant of this kind in Japan. We met members of 3rd Manufacturing Engineering who had been involved in the project from the very beginning to hear their approaches and aspirations.



SUBARU's Clean Plant

We are working for a "Clean Plant" that proactively takes energy-saving approaches while cutting manufacturing costs by eliminating waste and losses. Oizumi Plant of Gunma Manufacturing Division had four existing plants on the site and produces all SUBARU engines, with many types flowing in one line in an eco-friendly way.

With such setup, a change of the engine type to be produced will result in loss from stopping the line. Any new plant, therefore, is required to have both "flexibility" and "productivity" for quick engine changeover. The reasoning led us to aim for a plant that is "environment-friendly" and "resilient to change."

Pursuit of a Plant Friendly to Earth's Environment and Employees

What counts for a plant friendly to the environment is its capability to make products with minimum use of energy and minimum discharge of waste. At the 5th plant of Oizumi Plant, the production process was fully reviewed for fastest production with a minimum of equipment. As a result, the old production facilities were replaced with high-performance, more compact ones. In the machining line, the lubrication system was converted to be a nearly dry machining type with minimum use of machining oil to reduce the amount of waste fluid. In the assembly line, AGV (Automated Guided Vehicle) was introduced instead of a belt conveyor system to make the line flexibly responsive to rapid product changes.

The production lines were set up amid a relative shortage of staff experienced in plant startup. We adopted proposals and suggestions from young employees with the following positive results.

- Electric power consumption of the facilities reduced by 30% as a result of a reduced area ratio of 20%.
- Amount of discharged waste machining oil reduced by 30% as a result of introducing new technologies in the machining lines.
- Energy saving improved by 20% in the assembly line as a result of greater production efficiency.

Although such approaches to the global environment should be taken as a matter of course as a maker of things, we also regard maintaining a plant floor environment in which each of our people can work with comfort and peace of mind as one way to realize a clean plant.

This time, the zoned airconditioning was introduced in all the facilities, the first example ever for FHI. Without sacrificing of comfort, the ceilings were made 0.5m lower than those of the existing plants to reduce the volume of space to be air-conditioned, and the portion to be air-conditioned is limited to 2.2m from the ground where workers are. These are some examples of our efforts to minimize the use of energy. We also worked to reduce air pressure, noise and odor, and eliminate the entry of dust. All of these examples contribute not only to reduced incidents of equipment failure and improved workability, but also to the preservation of the global environment as a result of reduced use of energy due to higher production efficiency. We will keep pushing forward to make plants that use less energy for fabrication and achieve a better working environment.



3rd Manufacturing Engineering Department
Engine Machining Engineering Section
Manager

Masaaki Ohta



3rd Manufacturing
Engineering Department
Engine Machining
Engineering Section

Osamu Horibe

Machining Lines

Our mission is to achieve a reduction of electric power consumption by reviewing all of the processes.

In the lines of machining steel parts, all of the processes were reviewed from the beginning for better productivity. Streamlining unnecessary processes by trial and error and the conversion of the production equipment to compact higher performance equipment increased capacity fivefold over conventional facilities. We also cut production time by one-fifth, which translates to higher productivity and less electric power consumption.

Machined iron and aluminum chips are also collected for reuse. Reuse of powder generated in grinding is normally difficult, but we managed to lump it and separate the oil for reuse for the sake of recycling of resources.



More flexible by introducing AGV (Automated Guided Vehicle)



Turning the environment more human-friendly by air-conditioning the all facilities

Assembly Line

Our mission is to achieve energy saving by improving production efficiency.

In the past, in assembling an engine, we picked up necessary parts individually from the bins on both sides and in the rear. Being time-wasting, the part bins were discontinued and instead parts are now being prepared as a set for use in the line. In addition, AGV (Automated Guided Vehicle) was introduced to respond more flexibly to the change of line layout. Such changeover for time-saving hiked production efficiency by 20%, reducing the use of electric power consumption as well. Higher productivity naturally requires less manpower, which generates a return in the form of reduced energy for air-conditioning.



3rd Manufacturing
Engineering Department
Engine Engineering Section
(at time of interview)

Kazumi Yamauchi

The 5th plant of Oizumi Plant of Gunma Manufacturing Division

- Number of employees: 325 (as of November 2010)
- Floor area: 33,600 m²
- Main product: Automotive engines
- Line formation: 6 machining lines and 1 assembly line
- Production capacity: 14,000 units per month (scheduled to be increased eventually to 44,000 units with 12 lines for machining and 36,000 units with 2 lines for assembly per month)

Environmental Performance of New Horizontally Opposed Engines Produced at the New Plant

A new generation boxer engine was first mounted on the FORESTER that was put on the market in October 2010. This new generation boxer engine, wholly revamped for the first time in 21 years, has an extended backbone bore stroke compared with the existing engine, offering more compact combustion chambers as a result of full review of its structure in out-and-out pursuit of better basic performance.

These efforts led to realizing high environmental performance including energy savings of about 10% while achieving high driving performance including smooth acceleration over the entire zone due to increased torque in the practical use zone.

There are two types of 4-cylinder engines available with displacement of 2,500 cc and 2,000 cc, and in future they will be applied gradually to other models as their main source of power.



What SUBARU can do for the future?

Recently, with the declining birth rate and graying society, structural changes in industry and the economy, and changing employment conditions in the background, fostering children to support the next generation and their career education has become increasingly important. SUBARU has been involved in various social contribution programs to nurture them at each division and business location.



Scene of the lecture

Contribution to Developing Human Resources of the Next Generation

Nurturing the Next Generation through Motor Sports

SUBARU contributes to bringing up the next generation through motor sports programs. In such programs, engineers and competing drivers make inspiring speeches on their experiences, helping children understand the importance of getting closer to their own views of the world, future plans, dreams and hopes.

These programs started in 2006 and include speeches on "longing for cars," as well as "dreams and emotional inspirations infused by motor sports." These are delivered at primary, junior and senior high schools with demonstration drives to give children and students hands-on experience through their visual and tactile senses.

Automobiles are industrial goods seen around the world, which creates a culture in the area of motor sports. We would like to help this generation develop worldwide perspective and images of the future by conveying this cultural message. Through conversations on SUBARU sponsored classes at school and home, they have deepened their understanding of our activities, coming to see motor sports not as distinct, but rather much similar to other sports like baseball and tennis. They also realized that SUBARU takes part not only in economic activities, but also in the creation of culture.

We are planning to take up such subjects as environmental burden and energy conservation in the future. We will continue such classes to help this generation experience more excitement and fascination. They will drive the future of motor culture.

Voices from Children

- I learned to keep trying hard for my dreams without letting go of them. I can show my stuff out there in the world.
- I also want more people to experience this program.
- I also will find something I really want to do. I want to be a man who can say proudly, "I am betting my life on it."
- I want to study more to make society better, keeping in mind the environment, without letting technology alone go unchecked.

Close Up

Message from Top Management Top



This top management lecture was given by Mr. Mori (Chairman and CEO at present, formerly President and CEO) in SUBARU head office. Aiming to help students choose their own career after graduation, we received 47 freshman students from Ota Higashi High school in Gunma Prefecture for this lecture. Mr. Mori talked about the enjoyment of making products and how to prepare in school and the students listened attentively.

Also, 6 students on a school trip from Kochi Nishi High School in Kochi Prefecture also attended the lecture. They shared various impressions. One stated, "I want to take courses to work at a manufacturing company after graduation."

Approach to Grasping The Greatness of Making Things

Bus Tour for Hands-on Company Experience (Utsunomiya Manufacturing Division)

At the Utsunomiya plant, we hold "Scientific Experience" bus tours during summer holidays every year to let children realize the fun of science and industrial technologies and deepen their interest. In 2010, we offered a class on materials and manufacturing process of aircraft and the mechanism of flying to primary school children in Utsunomiya City and Otawara City. They were given chances to experience many things including directly touching composite materials.

Children will bear the future of Japan. Providing them with opportunities to touch real things also raises our own motivation. We will continue to unfold activities for contribution to the betterment of society, hoping to win more trust from our stakeholders.



"Scientific Experience Bus Tour" in Utsunomiya City



"Making-things Experience Bus Tour" in Otawara City

Date	Place	Participants
Aug. 3, 2006	Tochigi Pref.	40 Primary and junior high students and parents
Aug. 1, 2007	Utsunomiya City	100 Primary and junior high students and parents
Aug. 8, 2007	Otawara City	15 Junior high students
Aug. 22, 2007	Otawara City	21 Junior high students
Aug. 19, 2009	Otawara City	40 Primary students and parents
Aug. 19, 2010	Utsunomiya City	100 Primary students and parents
Aug. 23, 2010	Otawara City	50 Primary students and parents

Worksite Experience Activities (Saitama Manufacturing Division)



Responding to requests from the Board of Education of Kitamoto City, the Industrial Products Company welcomes second year student at high schools in the city for a hands-on worksite experience every year. These hand-on activities are intended to make them feel the importance of learning in society and understand the "importance of work in society" and "how things work in the real world."

In June, July and October 2010, we staged three-day events, accepting 7 junior high school students of Kitamoto City each time for hands-on experience assembling engine parts and working at reception. Participating students gave us their comments, saying that they realized both the difficult and interesting sides of works, and learned how to deal with other people. A teacher who led a group commented, saying that they had precious opportunities to learn something about society which cannot be taught at school. Another said, "the experience should help me in thinking over their future career guidance."

We will keep playing our part to contribute to educating local communities by willingly accepting students for hands-on worksite experience activities.



Assembling engines at worksite

Voices from Participants

- I have learned a lot through the experience which cannot be learnt at school.
- I have realized how hard work is and also how interesting it is.
- I felt excited when I wore a work uniform.
- Through the reception work at the guard office, I learned how to respond to calls from outside. It made me very nervous, though.

To Connect the Rich Earth to the Future

"Eco Class Delivery Service" (Utsunomiya Manufacturing Division)

The "Eco class delivery service" in which our employees give lectures has been provided at primary schools in Utsunomiya City since FY2006 to let the children who forge the future understand the current status of global warming and serve as a catalyst to prevent global warming. Through their participation in environment-related experiments, children are expected to more closely feel the environment and confirm the outcomes of the experiments in a pleasant atmosphere, followed by their promises of what they think they can do against global warming at the end of the class. Another example is a corner where they can experience composite materials which are used in aircraft as environment-friendly products because of their lightness for better fuel efficiency. The corner is arranged to draw their attention to making things and incite their scientific interests. Up to FY2010, the number of classes totaled 100 or 4,000 students and in FY2011, we have so far received requests for more than 30 classes or over 1,000 students, demonstrating this eco class delivery service has taken root in the community.



Scene of the Eco Class