# 2001 Annual Report



In recent times, Korean people faced a new environment that needs a change and reform, and we are making every effort to change our society to more safe, sound and competitive one.

Under this social atmosphere, Korea Occupational Safety and Health Agency, KOSHA, conducted a variety of customer-oriented projects to protect worker's life, safety and health and to promote industrial competitiveness in 2002.

In order to effectively meet this change in occupational safety and health and to provide an on-site service for the workplaces, KOSHA performed technical guidance, supported to build self-regulatory safety management system, and to create safe and sound working environment.

The safety and health is the realization of humanism that secures the life and protects the health of workers. It is not a matter of choice depending on the time and environment but the highest value that we all have to pursue.

This annual report provides you with information and data of the projects that we did last year for the prevention of worker's safety and health. I hope this annual report will contribute to the information exchange for the prevention of industrial accidents and occupational diseases.

**- Yong-dal KIM President -**

# 2001 Annual Report





## 1. Purpose of Establishment and History

### 1-1. PURPOSE OF ESTABLISHMENT

The Korea Occupational Safety and Health Agency (KOSHA) was established on December 9, 1987 in accordance with the provisions of the Korea Industrial Safety Corporation Law (Enacted May 30, 1987 under Law No. 3931). The purposes of this agency are to research, develop and disseminate industrial accident prevention technology; to provide occupational safety and health technology guidance and training, and to inspect dangerous machines to promote the safety and health of workers and the accident prevention policies of business owners.

### 1-2. HISTORY

| | |
|---|---|
| May 30, 1987 | Promulgation of the Korea Industrial Safety Corporation Law(Registered No. 3931) |
| December 9, 1987 | Establishment of the Korea Industrial Safety Corporation (KISCO), and of the Industrial Safety Training Institute |
| July 12, 1989 | Establishment of the Industrial Safety and Health Research Institute |
| January 30, 1992 | The Industrial Safety and Health Research Institute was divided into two independent entities such as the Industrial Safety Research Institute and the Industrial Health Research Institute |
| 1988 ~ 1997 | Three Regional Head Offices and 14 Area Offices were established.<br>- Regional Head Offices : Seoul, Busan, Gwangju<br>- Area Offices: Incheon, Suwon, Uijongbu, Ansan, Chunchon, Daegu, Ulsan, Pohang, Gumi, Changwon, Daejon, Jungju, Chonju and Yosu |
| December | The Industrial Safety Research Institute and the Industrial Health Research Institute merged into |

| | |
|---|---|
| 24, 1998 | single entity as the Industrial Safety and Health Research Institute. |
| January 1, 2000 | The Korea Industrial Safety Corporation (KISCO) was renamed to the Korea Occupational Safety and Health Agency (KOSHA), the Industrial Safety and Health Research Institute to the Occupational Safety and Health Research Institute, and the Industrial Safety Training Institute to the Occupational Safety and Health Training Institute respectively. |
| December 24,2001 | Two Area Offices were established.<br>- Area Offices: Northern part of Seoul, Cheonan |

# 2001 Annual Report





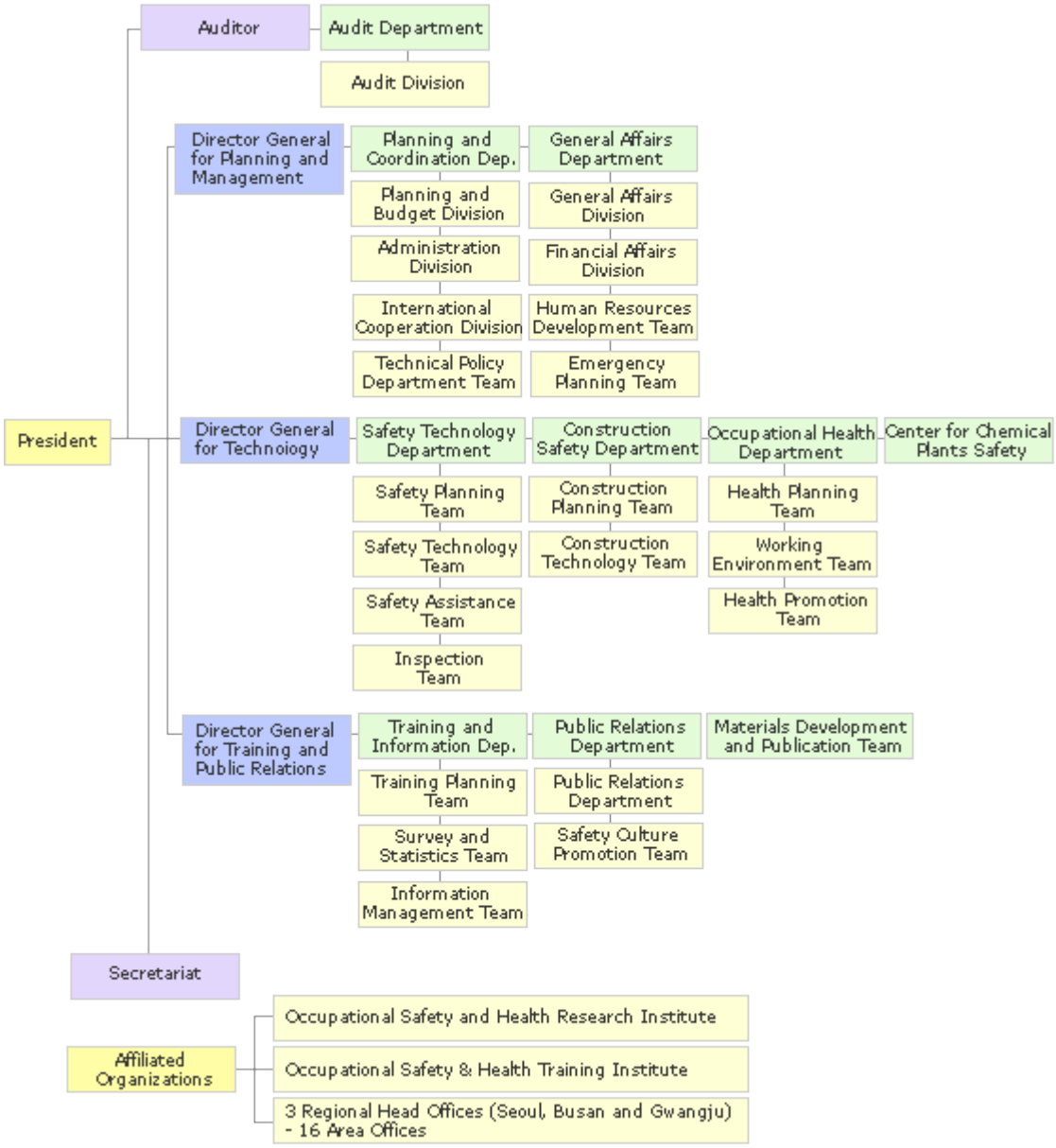
## 2. Function and Organization

### 2-1. FUNTIONS

Technical assistance related to safety and health for workplaces with high accident rates
Safety inspection at dangerous construction sites
Working environment improvement guidance on the prevention of occupational diseases
Examination of accident prevention programs and process safety management reports
Development and dissemination of Material Safety Data Sheets
Inspection of dangerous machines, tools and equipment and safety certification
Testing of safety devices and personal protective equipment
Diagnosis and inspection of safety and health at workplaces
Research, development and dissemination of industrial accident prevention technologies
Research into the diagnosis and prevention of occupational diseases
Establishment of technical standards of safety and health
Establishment and amendment of technical standards
Training for owners, workers and persons related to safety and health
Collection and dissemination of information and materials related to occupational
safety and health, and operation of computer communication networks
Launching of a safety culture campaign and publicity to broaden safety awareness
International cooperation
Miscellaneous projects commissioned by the Ministry of Labor and
other central administrative agencies related to occupational safety and health

### 2-2. ORGANIZATION

[ Head Office ]




[ Executive Officers]

Auditor
Kim, Chang-jin

Director General for
Planning & Management
Kong, Deok-soo

Director General for
Technology
Han, Kyun-won

Director General for
Training & Public Relations
Choi, Soo-kil

# 2001 Annual Report





**3.Personnel**

| | Total | Engineer | Researcher | Training and public relatins | Management |
|---|---|---|---|---|---|
| Total | 1,184 | 624 | 114 | 236 | 210 |
| Head Office | 213 | 78 | - | 61 | 74 |
| Affiliated Organizations | 971 | 546 | 114 | 175 | 136 |

# 2001 Annual Report



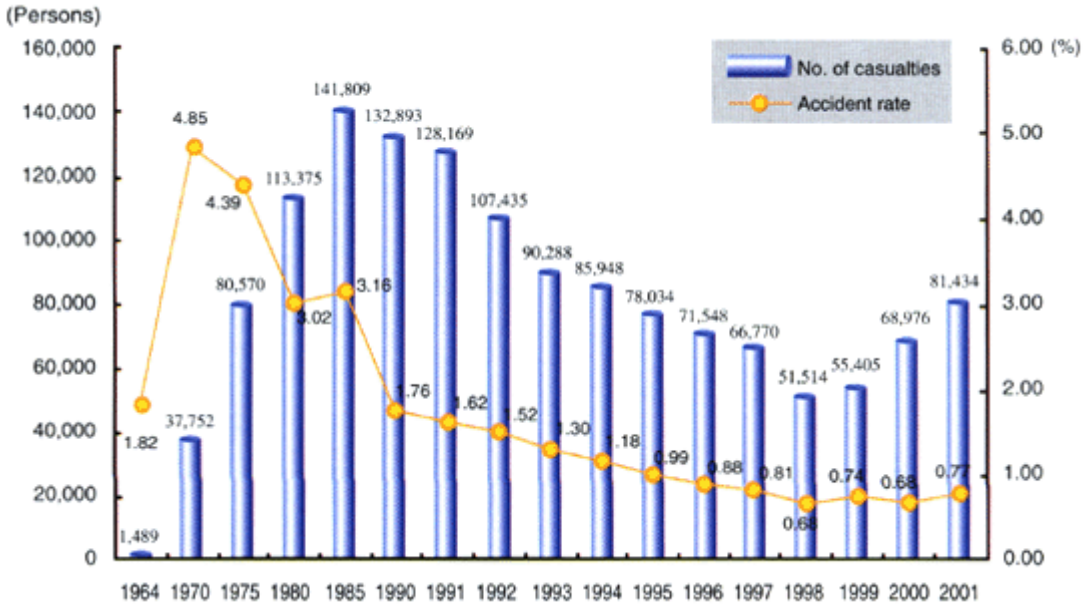


**Industrial Accidents and Occupational Diseases**

**1. Accidents by Year**

The occurrence of industrial accidents and occupational diseases is closely related to the increase in working people and industrial development. The number of industrial accidents was extremely low during the 1960's in the early stages of economic growth. Since the 1970's, when full-scale economic development began; however, industrial accidents and occupational diseases have emerged as a serious social problem. Industrial and technological innovations during the 1980's brought rapid changes to the work environment, which lead to an increase in industrial accidents and occupational diseases.

Thanks to changes in safety awareness at the workplace and the government's steady industrial accident prevention activities, the number of cases began to gradually decline. In 1998 and 1999, however, when the nation's economy underwent dramatic shifts due to the IMF crisis, the number of cases showed rapid decrease which was followed by slight increase. When the workplaces eligible for industrial accident compensation were expanded to include those with one or more employees in July 2000, the number of casualties began to increase.



# 2001 Annual Report

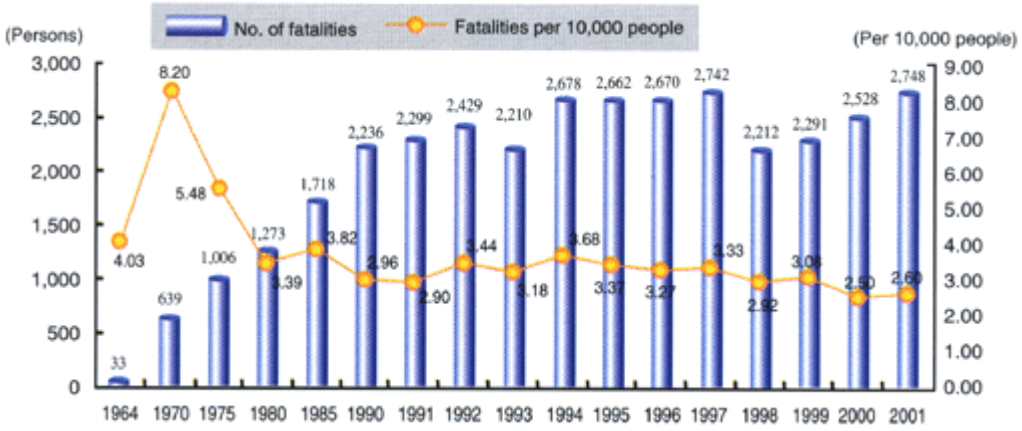




**Industrial Accidents and Occupational Diseases**

**2. Fatalities by Year**

The introduction of new technologies and facilities in the 1980's brought forth rapid changes in the working conditions and environment. Accordingly, the pattern of industrial accidents and occupational diseases became diversified and their intensity was magnified. The fatality rate per 10,000 people is stabilized but the total number of fatalities has continuously increased since 1998 because of the increase in occupational diseases and resulting deaths.



# 2001 Annual Report

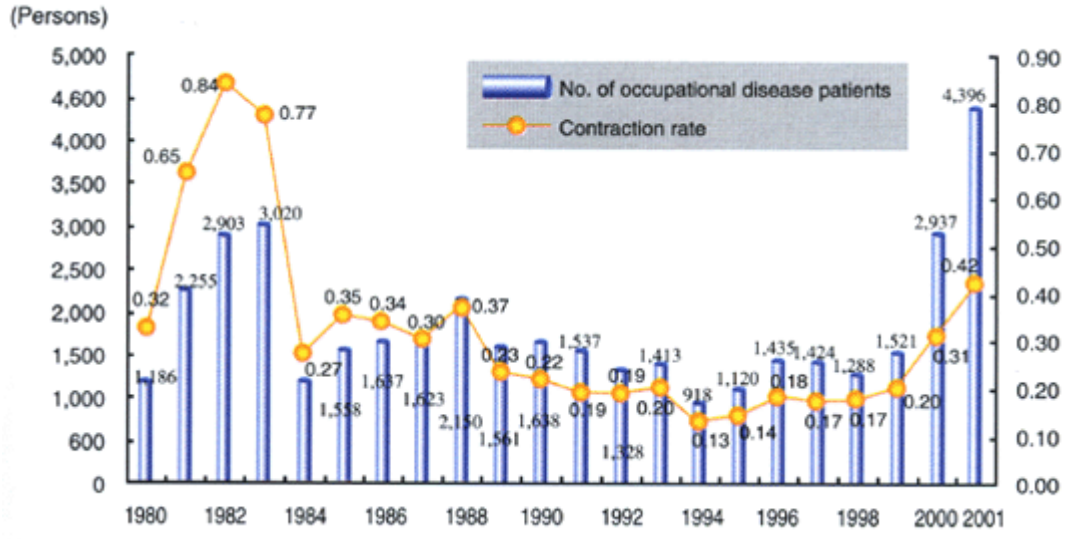



- Accidents by year
- Fatalities by year
- **Occupational Disease by year**


**Industrial Accidents and Occupational Diseases**

### 3. Occupational Deseases by Year

The number of pneumoconiosis patients has slightly decreased due to a decline in the mining industry; however, occupational diseases such as the new types of occupational diseases and cerebrovascular and heart diseases have increased due to a broader utilization of new chemicals by the manufacturing industry and the expanded workplaces eligible for industrial accident compensation .



# 2001 Annual Report





**Major project**

**1. Accident Prevention Support for Small-medium Enterprises**

Most small-and-medium enterprises use conventional hazardous machines and equipment with a high potential risk and their safety management and working environment are in a poor situation. Enterprises with less than 50 employees are exempted from the obligation of appointing safety managers and health managers pursuant to the Occupational Safety and Health Law. They have a tendency of having more high accident rate than that of large size enterprises due to lack of safety and health awareness of the owners and workers.

Accordingly, KOSHA provided intensive support of safety and health technologies that are suitable for each corporate situation in order to promote the safety management capabilities in SMEs. KOSHA also provided financial support to improve working environments where necessary and to create clean workplaces as part of an accident prevention program.

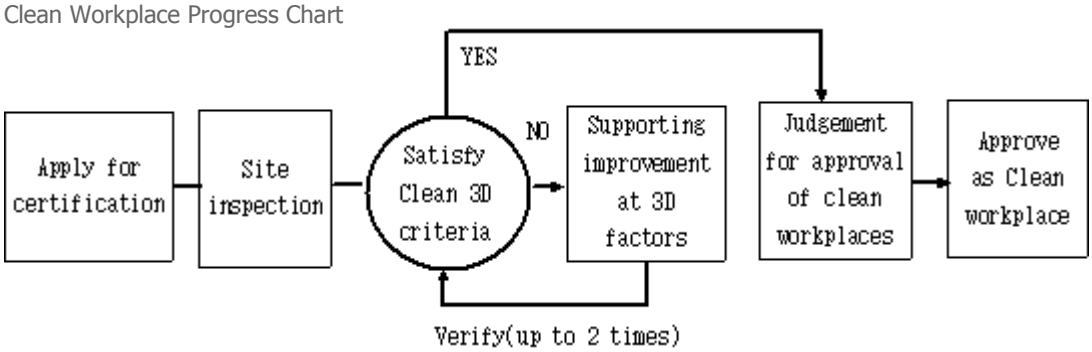
**1-1. Support creating clean workplaces**

Small workplaces with less than 50 employees usually have a poor working environment and a weak financial situation making it difficult to invest the fundamental safety measures. They are experiencing manpower shortage as workers shun hard working. In connection with this, KOSHA plans to prevent industrial accidents at small workplaces by providing necessary support related to safety and health. KOSHA will also propel "Clean"projects to solve the manpower shortage.

To achieve the above purpose, KOSHA intends to construct "Clean Workplaces" by providing concentrated financial and technical support for the improvement of safety and health at some 7,000 manufacturing plants.

KOSHA promoted employers' participation through publicity activities and local-oriented support. At the same time, KOSHA organized and operated a "Clean Project Team" at each regional office and area office.

Clean Workplace Progress Chart




* 3D : Danger, Dirtiness and Difficulty

(1) Technical Assistance relating to safety

Under this program, KOSHA will directly provide technical assistance to 5,000 workplaces to make safe and pleasant working environments by eliminating or improving 3D factors such as the harmful and dangerous elements extant at the workplaces and problems related to work. It will also provide the same support to some 47,500 workplaces through safety management agencies. During 2001, KOSHA provided technical support to 2,522 workplaces while the agencies provided support to 11,050. This means that technical support has already been provided to 13,572 workplaces.

(2) Safety and health management support for affiliates of large enterprises

In order to provide safety and health management support to some 10,000 affiliates with less than 50 employees belonging to large business groups, KOSHA induces the parent firm to voluntarily support its affiliates. During 2001, necessary support was provided to 8,701 workplaces. KOSHA provided active support to the parent firms by training parent firm's safety and health managers and offering related materials. KOSHA monitors the results of support given to the affiliates to obtain and disseminate superior cases. If requested by the parent firm, KOSHA plans to continue support for technology and education.

(3) Self-inspection through agencies

Workplaces with less than 5 employees are not required to conduct self-inspections. Under this program, KOSHA will have inspecting agencies conduct inspection covering some 40,000 units of 13 types of dangerous machines and equipment subject to self-inspection. This system is designed to prevent industrial accidents by ensuring the fundamental safety of the dangerous machines and equipment. During 2001,742 units were inspected.

**1-2. Technical support for workplaces with less than 50 employees**

KOSHA concentrates its technical support of safety and health management system on enterprises showing high industrial accident rates due to poor safety management among enterprises with less than 50 employees.

Major technical support provided to small workplaces includes presentation of accident prevention measures, safety and health training, provisions of technical materials, and training on the safety & health system. During 2001, KOSHA provided concentrated technical support for workplaces with less than 50 employees covering the 5 major hazardous industrial sectors with the highest rate of accidents.

Furthermore, to eliminate the blind spots of safety and health management where technicians from KOSHA cannot be dispatched, KOSHA appointed private safety and health agencies in 1993 to provide technical support on behalf of KOSHA.

Recently, KOSHA instructed agencies to perform duties according to ISO standards. It developed a technique of quantitatively assessing the performance of agencies for application in all sectors. In 1999, KOSHA developed the STAR(Safety Technology Assistance Rating) Index evaluation program to check the ability of the agencies. KOSHA plans to develop and apply the SHARP(Small Business Health Assistance Rating Program) Index to health management agencies starting in 2000.

Agencies with a performance level below minimum criteria as assessed by such evaluation system were barred from providing technical support. Since this system was implemented, a significant improvement in agencies'ability to provide technical support has been noted.

**Technical support provided to workplaces with less than 50 employees for the past 3 years**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Total | 42,634 | 27,895 | 18,377 |
| Technical support by KOSHA | 12,799 | 5,477 | - |
| Safety management agencies | 10,077 | 12,569 | 8,767 |
| Health management agencies | 19,758 | 9,849 | 9,610 |

**1-3. Technical support for workplaces with less than 5 employees**

As the Occupational Safety and Health Law had been applied to all workplaces regardless the number of workers from July 2000, the importance of providing an industrial accident prevention program to workplaces with less

than 5 employees has been socially issued. Workplaces with less than 5 employees experience a high rate of industrial accidents due to poor working environment and safety management, lack of safety awareness by the owners and workers, and the out-of-date manufacturing equipment, machines, and facilities.

During 2001, KOSHA provided technical support to 16,239 small workplaces with high accident rates. KOSHA provided technical support related to safety to 8,163 workplaces and technical support related to health to 8,076 workplaces.

By expanding greatly the area of support in 2002, KOSHA will provide technical support and subsidies to manufacturing plants highly vulnerable to accidents or occupational diseases in connection with the creation of CLEAN Workplaces.

In addition, KOSHA intends to develop, for presentation to these workplaces at the time technical support is provided, the safety and health standards applicable to these small workplaces in the form of cartoons, One-Page Sheet, and safety and health stickers. KOSHA will then induce the small workplaces to take an active interest in safety management through these items and reduce accidents by promoting safety awareness.

During 2001, KOSHA organized a shipbuilding accident prevention team in Busan Regional Office when organization of KOSHA was restructured. This is to fundamentally prevent accidents at shipyards where serious accidents including fatalities occur due to the characteristics of the complicated work. The team develops and supplies risk evaluation techniques and the advanced technology standards, contributing to the prevention of shipbuilding-related accidents by providing safety and health technologies fitting the type of work.

As a result in 2001, KOSHA provided technical support to a total of 34 shipyards including 24 medium-large shipyards and 10 small shipyards. In addition, training was conducted for 1,545 workers in 33 lecture sessions to prevent occurrences of accidents resulting from lack of training.

# 2001 Annual Report





**Major project**

**2. Promotion of Self-regulatory Safety Activities at Workplaces**

In order to promote self-regulatory safety activities at each workplace, KOSHA changed its strategies from a system of supporting safety management at each workplace to focusing more on promoting capabilities of the safety management system of the enterprises and intrinsic safety at the workplaces. KOSHA has developed and provided a safety and health management system that combine business management with safety management activities in order to improve the self-regulatory system and capabilities of safety management in the large enterprises. For workplaces suffering short of safety technologies, KOSHA provides on-site technical support and safety assessment to discover potential risk factors and help the enterprises set up their management plan.

Meanwhile, KOSHA pursuits the intrinsic safety of machinery from the manufacturing stage by operating a safety certification system for the hazardous machines, tools, and safety devices. KOSHA also support the investigation of accidents performed by the Ministry of Labor to determine the causes and preventive measures from recurrence.

**2-1. Safety and Health Management System (KOSHA2000 program) certification**

Safety and Health Management System means a system under which an owner reflects safety and health policies in corporate management policies and establishes detailed execution guidelines and regulations for all workers to follow. In addition, the management periodically self-evaluates the results of the safety and health management plan to ensure its continuous improvement

In order to effectively distribute such a safety and health management system, KOSHA in July 1999 started

implementing the KOSHA 2000 program certification system for all workplaces.

Under the KOSHA 2000 program, the safety and health system of each workplace is evaluated and a certificate and a certification plaque are issued when the safety and health system meets the certification criteria.

The safety and health management system under the KOSHA 2000 program consists of workplace analysis, establishment of policies related to safety and health management and objectives, establishment and implementation of the safety and health management system, evaluation of the results and self-inspection, and manager examination. Each workplace voluntarily determines the detailed method of applying and implementing each component element by considering the size of the workplace, management environment and objectives, and the existence of potential hazards.

During 2001, KOSHA presented certificates to 71 voluntary participants whose safety and health management systems are considered satisfactory. Currently, there are 142 workplaces that have received certificates. KOSHA plans to issue more certificates in the future.

In addition, to expand the supply of the safety and health management system, we operate the evaluator-training course of KOSHA 2000 program for safety and health specialists and agency employees.

**2-2. Assistance of safety and health technology**

To promote safety management capabilities of workplaces lacking self-regulatory safety and health management policies and procedures, KOSHA provides the technical support necessary to establish safety and health improvement programs, distributes collections of accident information by conducting investigations into serious accidents. KOSHA carries out accident prevention projects like the safety and health diagnosis aimed at discovering and improving risk factors.

For this project, the Ministry of Labor selects applicable workplaces while KOSHA establishes an appropriate plan with respect to safety management, providing technical support to workplaces so that they can voluntarily improve their safety and health activities. KOSHA supports the follow-up action of MOL by confirming the implementation of their activities.

KOSHA conducts safety and health auditing to effectively improve safety & health of workplaces by assessing potential risk elements at work sites. This auditing can be performed in accordance with the provisions of Article 49, Occupational Safety and Health Law, or by the voluntary request of the enterprises. **2-3. Dissemination of safety certification "S" mark**

The S-mark safety certification system was introduced in November 1997 in accordance with the provisions of Article 34-2, Occupational Safety and Health Law. The purpose of this system is to comprehensively evaluate product safety and reliability, and the manufacturers' quality control system in order to help machine and tool makers design and produce safe products, and prevent industrial accidents by enabling manufacturers to distribute safe products.
Safety certification is required mainly for industrial machinery; however, it is applicable to all items ranging from simple machines such as safety devices, protective gear, and parts including industrial machinery to the advanced semiconductor manufacturing equipment.

The S-mark safety certification examination criteria are divided into esstential certification standards (safety certification regulation, etc.), common certification standards (KOSHA CODE, design and installation of a safety guard, etc.), and product-specific standards, which shall be governed by international standards (ISO, and IEC) and European Norm (EN).

Prior to filing an application for S-mark safety certification, the applicant will discuss fully and exchange information with KOSHA regarding the range of certification, related procedures, and the product in question. The applicant will establish positive target values of product safety prior to submitting an application for certification.

The certification examination shall undergo "documentary examinations", an evaluation of product safety design, "quality control check" conducted to evaluate manufacturer's quality control system, and "product inspection and test". If requested by the applicant, the applicant may receive "preliminary examinations" prior to the principal examination so that the applicant may make prior preparations for the certification examinations. In case a product is modified after receiving a safety certification, the manufacturer is required to apply for a modification examination. In order to maintain the quality of the certified products, KOSHA visits certified workplaces at least once a year to conduct a surveillance check starting with the year following such certification.

During 1997~l999 after the S-mark safety certification system was introduced, many domestic enterprises showed interest in the system. Starting in 2000, however, manufacturers from foreign countries, such as Japan, U.S., and Britain applied for the S-mark. The number of foreign applicants and consultations has increased, and up to now KOSHA has received 231 applications from 76 foreign enterprises.

During the past 3 years, KOSHA received 1,798 applications from 373 enterprises, and certifications have been issued to 1,068 cases of 206 enterprises. Due to worldwide economic depression, the number of certification

applications decreased slightly in 2001. However, certification applications for industrial machines are steadily rising. The number of applications is expected to rise sharply starting in the latter half of this year when the economy is expected to gain full recovery.

| | No. of applications(No. of workplaces) | Results processed<br>No. of certifications issued(No. of workplaces) | No. of cases returned(No. of workplaces) |
|---|---|---|---|
| Total | 1,798(373) | 1,068(206) | 618(179) |
| 2001 | 305(91) | 534(98) | 199(71) |
| 2000 | 852(175) | 372(79) | 240(82) |
| 1999 | 641(107) | 162(29) | 179(26) |

**2-4. Development and distribution of safety & health standards**

Technical standards related to safety and health are essential to acquire safety and health at workplaces. In January 1990, technical guidelines, working environment standards and provisions related to the operation of the General Technical Standard Committee were added to the Occupational Safety and Health Law. The Committee was placed under the control of KOSHA.
The Technical Standard Committee is composed of 8 Technical Committees - General safety, Electric safety, Machine safety, Chemical safety, Construction safety, General health, Occupational medicine and Occupational hygiene, and a General Standard Committee which finalize the draft for standards. Each Committee is composed of maximum 20 members of experts from workers' and employees' representatives, relative authorities, KOSHA, industries and academia.

Matters that must be complied with among those determined by the General Technical Standard Committee are submitted to the Ministry of Labor for public announcement in the name of the Minister of Labor. Other items are classified into KOSHA Code and announced by the President of KOSHA for the use in industries. Currently, there are 29 cases announced by the Ministry of Labor, and 223 KOSHA Codes including 41 Codes added in 2001. KOSHA Codes are distributed through printed material and Internet Homepage for widespread use. As the utilization of KOSHA Codes has been constantly increasing, KOSHA is concentrating its resources on improving the quality of KOSHA Code by reviewing all of them within 5 years after initial release to meet the requirement from industries and the changes of industrial technologies, in addition to the regular establishment of new KOSHA Codes.

KOSHA uses international standards as reference when developing KOSHA Codes to reflect advanced technologies. In particular, KOSHA is a secretary organization of national committees and participates as a P-member in ISO/TC 96 (Crane), ISO/TC 108 (Vibration), ISO/TC 146 (Air quality), IEC/TC 31 (Explosion-proof),

and IEC/TC 64 (Construction/Electric equipment). Since international standards tend to be more adopted as domestic standards, participation in such international standard activities is expected to increase.

**2-5. Safety and health technology information service**

KOSHA has built a database containing domestic and foreign materials related to safety and health. Under a title called KOSHA-NET service system, KOSHA provides such materials to workplaces and the general public free of charge.
The official KOSHA-NET service began on July 1, 1996 as PC communication services. Starting in January 2000, KOSHA operates an Internet service . Approximately 70,000 members comprising safety and health managers at job sites and owners take advantage of the information service.

Materials provided through the KOSHA-NET include 12 fields: government policies and legal information; technology; Material Safety Data Sheet (MSDS); KOSHA-code and examples of accidents. In particular, information on some 50,000 kinds of toxic chemicals is favored by the members. Currently, the database contains information covering approximately 165,000 cases.

Starting in 2001, KOSHA began to provide diversified technical Information services through Web such as computerized moving pictures, cyber safety and health training.

KOSHA plans to develop more diversified and upgraded Internet contents for distribution to the general public and persons related to safety and health, contributing greatly to the prevention of accidents at industrial sites.

**2-6. ILO-CIS Center**

The information center operates a special database containing domestic and overseas information on safety and health for use by the KOSHA employees and visitors. Through KOSHA-NET, KOSHA focused on providing translated version of overseas safety and health news and technical materials. To ensure that users can easily utilize domestic and overseas information, KOSHA translated and posted related materials on the KOSHA-NET. In particular, KOSHA translated and published some part of the Encyclopedia of Occupational Health and Safety (The 4th edition, 1998) issued by the International Labor Organization. The translation concerns management & policy, accidents & safety management available to safety and health experts or related persons. 250 copies were published first for distribution to national and public college libraries and government agencies. KOSHA plans to build a database in the KOSHA- NET for use by the interested workers at all workplaces throughout the nation. KOSHA will continue translating the remaining essential parts during 2002.

Safety and health-related laws and OHS management systems of the U.S., Britain, Germany and Japan have been translated for comparison with those of Korea. KOSHA compares how safety and health matters are

supervised and managed in these countries. If any information or items cannot be searched for easily by the safety and health information users, KOSHA helps them find such items on behalf of the users. Such information search service numbers some 1,000 cases per year. Safety and health managers, college students, experts and many different classes of people use the service through networks.

Starting in 2001, KOSHA began to publish and provide "KOSHA Occupational Safety & Health Newsletter" on the Internet on a quarterly basis. This is to let the foreigners engaged in the related business regularly gain access to the safety and health news in Korea.

Foreigners can access at the www.kosha.or.kr/~english to obtain the latest information on safety and health events, newly developed technology, results of research, statistics and revision to laws in Korea. Interested parties may contact for details or inquiries on domestic

# 2001 Annual Report





**Major project**

### 3. Prevention of Occupational Diseases and Preservation of Workers Health

Recently as new chemicals have been developed by advanced industries like semiconductors and the heavy and chemical industries, the incidence rate of occupational diseases is ever increasing. Furthermore, celebro-cardiovascular diseases resulting from mental stress and the musculoskeletal disorders resulting from repetitive operations from VDT work, etc. are rapidly increasing.
To deal with this situation effectively, KOSHA conducts examinations of working environments monitoring. If monitoring results repeatedly exceed governmental standards, KOSHA provides technical support to handle workplace risks and information on harmful chemicals. KOSHA also is launching a variety of projects to prevent occupational diseases such as cerebro-cardiovascular diseases, and the musculoskeletal disorders.

### 3-1. Technical support provided to workplaces with poor working environment

KOSHA provides technical support during the process of handling hazards by classifying working environments by grades based on work site inspections. Criteria include the types of chemicals handled and whether exposure limits are exceeded. This has contributed greatly to the prevention of occupational diseases and improvement of working environments.
Workplaces dealing with carcinogenics (31 types including unconfirmed materials) are classified as workplaces subject to "Special management." Workplaces inspected last year and discovered to have employees that exceeded the mandated exposure limits to these substances and those workplaces found to have occupational disease potential were designated as workplaces subject to "intensive management."

Industrial hygiene experts visit workplaces so designated to conduct evaluations of the working environment.

These inspections determine the type and degree of hazardous work, evaluate the working environment, and inspect the local ventilation systems. The experts then prepare and submit a report to the appropriate responsible individuals on improving the working environment. After a specific period, the experts confirm that the workplace is now in compliance with their previous findings.

KOSHA helps companies that have repeatedly exceeded exposure limits create pleasant working environments and preserve workers' health by developing and distributing working environment improvement technologies.

Keeping with KOSHA's commitment to prevent oxygen deficiency in the workplace, training has been conducted for 11,134 workers from 5,634 workplaces that are considered vulnerable to asphyxiation caused by oxygen deficiency in the rainy season and summer heat. KOSHA leased out at no charge, 823 units of equipment to 320 workplaces. This equipment included oxygen concentration meters, ventilation fans, and other equipment for the prevention of oxygen deficiency.

**Technology support provided by type**

| | Special managament | | | | intensive management | | |
|---|---|---|---|---|---|---|---|
| | Total | Jointly with Ministry of Labor | Independently by KOSHA | Independently by workplaces | Total | Jointly with Ministy of Labor | Indepe ndently by KOSHA |
| 2001 | 1,606 | 134 | - | 1,472 | 1,311 | 1,311 | - |
| 2000 | 1,458 | 149 | 84 | 1,225 | 843 | 477 | 366 |
| 1999 | 1,126 | 124 | 87 | 915 | 1,073 | 405 | 668 |

**3-2. Prevention of work-related diseases**

As Korean's living standards have improved, workers' health requirements are becoming more of an issue of public concern. Workers serving in a complicated, modern industrial society need to manage not only their physical health but also their mental health. In the past, KOSHA performed an "after the fact" style of health management that was only concerned with the early discovery of occupational diseases and other health disorders. Now, KOSHA is operating in a proactive mode of health management by providing free health training to those individuals participating in the health promotion project. This innovative project continues to be concerned with work-related diseases but is also attempting to implement changes that will prevent celebro-cardiovascular diseases, and musculoskeletal disorders.

In order to prevent musculoskeletal disorders and celebro-cardiovascular disorders suffered by workers at workplaces with less than 10 employees, KOSHA began to operate a ¡°Health Helperi¹ starting in November 2001 for approximately 30,000 job sites. KOSHA visits workplaces with a history of employees having basic

diseases (hypertension, hyperlipemia and diabetes) to provide assistance in establishing and implementing plans related to health.

KOSHA's help includes assistance in establishing and implementing plans that provide health consulting services, health training aimed at promoting workers' health and health consulting services, exercise function tests and exercise guidance, ex-post facto management of medical check-up, blood-pressure checks, and other simplified tests. KOSHA also provides first aid medicines and related technical data.

Musculoskeletal disorders occur frequently at car manufacturing plants and other similar places. To prevent such disease, KOSHA formed a task force team composed of ergonomical experts and provided technical assistance to 45 worksites. KOSHA hosted international seminars to promote the prevention awareness of the labor and the management and holds a superior case presentation annually for the prevention of musculoskeletal disorders and health improvement.

Additionally, KOSHA operates workers' exercise function test centers at Seoul, Busan and Gwangju regional offices, and Incheon and Changwon area offices to improve workers' physical fitness and create a health conscious culture at workplaces.

**Training and technical assistance provided to improve workers'health**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Technical assistance provided to workplaces(sites) | 7,356 | 1,724 | 1,008 |
| Training provided to workplaces(sites) | 16,877 | 1,436 | 696 |
| Workers'group training(persons) | 46,884 | 112,106 | 17,278 |
| No. of workers utilizing exercise function test center(persons) | 14,675 | 20,736 | 14,103 |

**3-3. Early detection of occupational diseases**

(1) Epidemiological investigation

A health check-up may reveal that many workers have chronic or recent onset of occupational diseases or precursors to these diseases. When these findings are present, the Occupational Safety and Health Research Institute forms an epidemiological investigation team composed of health specialists and Center for Occupational Disease Research members to determine the causes through epidemiological research. The results of this work are used to prevent disease reoccurrernce.

Employers and/or the occupational physicians can request the Institute to conduct epidemiological investigation

when they meet any special illness or conditions which are not clarified by regular air monitoring and health examination.

The Institute selects chemicals or work processes that can cause occupational diseases carries out epidemiological investigation for them in workplaces throughout Korea.

The Occupational Epidemiology and Surveillance Team in Changwon evaluates the working environments of the petrochemical complex and shipyards concentrated in the southern part of Korea. In addition, it enhances early detection and/or prevention of occupational diseases through health checkup and occupational disease surveillance center.

It also conducts epidemiological investigation on hazardous substance intoxication and occupational cancers, and performs occupational diagnosis disease.

During the year 2001, the Institute carried out epidemiological investigation on methyl bromide, benzene, waste recycling plants, casting dust, coal tar, coke, and talc.

- **No. of investigated cases**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Total | 129 | 77 | 848 |
| Internal selection | 114 | 56 | 69 |
| Workers'group training(persons) | 46,884 | 112,106 | 17,278 |
| External request | 15 | 21 | 15 |

(2) Occupational disease diagnosis

When it is difficult to determine if a patient referred to Korea Labor Welfare Corporation for compensation has an occupational disease or when the health problem is suspected of being a new occupational disease, the Corporation shall request the Occupational Safety and Health Research Institute to make a decision. The Occupational Safety and Health Research Institute then reviews the current medical literature, evaluates the working environment, and conducts a comprehensive medical evaluation. It consolidates all data, reaches a conclusion, and communicates the findings to the Corporation.

- No. of cases requested for the evaluation of work-relatedness

| | Total | Accepted | Rejected | Undetermined |
|---|---|---|---|---|
| 2001 | 132 | 48 | 60 | 24 |
| 2000 | 128 | 66 | 56 | 6 |
| 1999 | 108 | 51 | 53 | 4 |

(3) Health management pocket books and medical examinations

The Occupational Safety and Health Research Institute monitors the medical condition of the health management pocket book holders to effectively control the health of the retirees who had been exposed to carcinogenic substances. The health management pocket book holder can receive medical diagnoses from special Health Examination clinics for early detection of occupational cancers. The Institute consolidates the results of these medical examinations for use as reference materials in the long-term tracing and management of occupational diseases. It makes every effort for early detection of occupational cancer for workers who had been exposed to carcinogenic substances in their working environment and while performing their required duties.

**No. of annual medical examinations conducted on workers who have been exposed to 11 carcinogenic substances**

| | Total | Asbestos | Silica(silicosis) | Benzidine chloride | Hexavalent chromium | Vinyl chloride | Cokes oven emission |
|---|---|---|---|---|---|---|---|
| 2001 | 90 | 44 | 31 | 1 | 6 | 7 | 1 |
| 2000 | 86 | 31 | 4 | 1 | 2 | 2 | 1 |
| 1999 | 74 | 21 | 19 | 7 | 25 | - | 2 |

(4)Occupational Disease Surveillance Center

Certain occupational illness, such as, asthma and lung cancer are frequently not detected by the special Health Examination, and workers tend to ignore these diseases since they are not certain about the disease coverage and compensation. For this reason, there have not been any appropriate preventive measures with respect to these diseases. Therefore, attempts are being made to discover these diseases through the operation of an Occupational Disease Surveillance Center.

The Occupational Asthma and Lung Cancer Surveillance Center is composed of allergists and physicians. The team was able to discover the previously unreported occupational disease cases and protect the health of workers. This Occupational Disease Surveillance Center can serve as a model for other types of occupational diseases.

To carry out more in-depth examinations, many domestic research institutes were commissioned to build suveillance centers by area (Seoul-Incheon area and Gumi) and/or by diseases (Occupational musculoskeletal diseases, occupational contact dermatitis, malignant mesothelioma and leukemia).

**Distribution of asthmatic agents of the reported cases**

| Harmfulsubstances | Total | 2001 | 2000 | 1999 |
|---|---|---|---|---|
| Total | 91 | 26 | 32 | 33 |
| TDI | 29 | 5 | 9 | 15 |
| Reactive dye | 9 | 1 | | 8 |
| Welding fume | 2 | | | 2 |
| Organic solvents | 4 | | 2 | 2 |
| Formaldehyde | 1 | | | 1 |
| Chemicals | 4 | 1 | 3 | |
| Saw dust | 5 | 3 | 1 | 1 |
| Flour | 1 | | 1 | |
| Antibiotics | 10 | 10 | | |
| Waste | 1 | 1 | | |
| Rubber | 1 | 1 | | |
| Unidentified | 24 | 4 | 16 | 4 |

**Job distribution of occupational asthma reported to the Surveilance Center**

| Occupations | No. of workers | | | |
|---|---|---|---|---|
| | Total | 2001 | 2000 | 1999 |
| Total | 91 | 26 | 32 | 33 |
| Simple laborers | 21 | | 5 | 7 |
| Dyers | 8 | 1 | | 7 |
| Painters/coaters | 9 | 2 | 3 | 4 |

| Occupations | No. of workers | | | |
|---|---|---|---|---|
| | Total | 2001 | 2000 | 1999 |
| Mechanics | 5 | | 1 | 4 |
| Tanneries | 3 | 1 | | 2 |
| Assemblers | 2 | | | |
| Electronics | 2 | | 2 | 1 |
| Textile worker | 2 | | 1 | |
| Baker | 1 | | 1 | |
| Welders | 1 | | 1 | |
| Welders | 1 | | 1 | |
| Timber millers | 1 | | | 1 |
| Welders | 1 | | 1 | |
| Packers | 1 | 1 | | |
| Grinders | 1 | 1 | | |
| Adhesive worker | 1 | 1 | | |
| Sanitation man | 2 | 2 | | |
| Machinery operator | 1 | 1 | | |
| Pharmaceutical manufacturer | 10 | 10 | | |
| Unidentified | 29 | 6 | 19 | 4 |

**3-4. Quality assurance**

The OSHRI (Occupational Safety and Health Research Institute) of KOSHA operates a quality assurance program to evaluate and improve the accuracy and reliability of working environment measurement and special health examinations to protect the health of workers. Agencies conducting working environment measurement and special health examinations shall participate in the program by the Occupational Safety and Health Law. These agencies can conduct working environment measurement and special health examinations only when they pass the quality assurance program.

Twice a year, test samples are mailed to participating Agencies. Test samples are prepared by the OSHRI and include activated charcoal tube, membrane filter, blood and urine, which contain a variety of organic solvents,

metals, and metabolites.

In order to have the analytical ability of an institution implementing such quality assurance program validated, the OSHRI has continuously participated in the international quality assurance programs, American Industrial Hygiene Association's Proficiency Analytical Testing Program, US CDC-BLLRS, and Germany's International Quality Assurance Program. The Occupational Safety and Health Research Institute has been rated proficient in those assurance programs.

The OSHRI provides the education and training courses for standardized diagnostic methods and criteria in special health examinations to accurately diagnose and prevent pneumoconiosis and occupational hearing loss.

KOSHA-OSHRI hosted an international seminar in commemoration of the 1Oth anniversary of the Working Environment Measurement Quality Assurance program. Domestic experts in related fields and professionals from the U.S., Britain and Japan attended. Subjects of discussion included the

results of Korean quality assurance programs, the improvement strategies of domestic quality assurance program, and examples of the quality assurance program operated in the three advanced countries.

**Results of quality assurance program by working environment measurement institutions (No. of qualified institutions/No. of participating institutions)**

| | 2001 | | 2000 | | 1999 | |
|---|---|---|---|---|---|---|
| Field | First half | Latter half | First half | Latter half | First half | Latter half |
| Organic solvents | 96/104(92%) | 92/96(96%) | 90/97(93%) | 100/104(96%) | 111/115(97%) | 118/120(96%) |
| Metals | 101/104(97%) | 92/97(95%) | 88/98(90%) | 97/104(93%) | 113/116(97%) | 119/124(96%) |

**Results of quality assurance program (No. of the proficient/No.of participants)**

| Round | | | 2001 | 2000 | 1999 |
|---|---|---|---|---|---|
| Biological monitoring * | Spring | Organic | 103/108(95%)** | 107/112(96%) | 96/104(92%) |
| | | Inorganic | 104/108(96%) | 107/112(96%) | 95/104(91%) |
| | Autumn | Organic | 106/109(97%) | 105/113(93%) | 102/108(94%) |
| | | Inorganic | 1108/110(98%) | 101/113(89%) | 97/108(90%) |
| Pneumoconiosis diagnosis | Spring | | 128 | 131 | 135 |

| Round | | 2001 | 2000 | 1999 |
|---|---|---|---|---|
| | Autumn | 69 | 72 | 59 |
| Audiometric evaluation | Spring | 109 | 106 | 110 |
| | Autumn | 65 | 83 | 26 |

* Contract on the patent related technology transfer (Aug. 26, 1999) :
Seoul Medical Science Institute
* Designated as the Reference Laboratory for German Qualify Assurance (Feb. 1999)
** Value in ( ) indicates the proficient rate.

**3-5. Establishment of the Material Safety Data Sheet system**

As a part of KOSHA's plan to prevent occupational diseases and accidents for workers handling chemicals, safety and health information of those distributed in the nation have been stored in the Korean version of MSDS database. The database has been provided to workplaces free of charge through the KOSHA computer network (KOSHA-NET).

The Material Safety Data Sheet system was initiated on July 1, 1996 and has thus far been accessed for a total of 615,926 cases since March 1996.

To maximize the effectiveness of the MSDS system, its authors sought out chemical companies to confirm the accuracy of the information on hazards and to check for omissions or errors. KOSHA also enlisted the chemical companies' assistance in providing continual supplements to the MSDS to maintain its accuracy. During the period from 1997 to 1999, KOSHA developed and distributed information notebooks containing summarized information on 509 chemicals deemed essential for workers handling chemical materials.

in 2001, KOSHA intends to strengthen its hazardous chemicals information services by surveying and selecting appropriate chemicals from manufacturing plants, workplaces and chemical importers and retailers. KOSHA additionally made available a Korean version of the MSDS database after selecting approximately 17,000 types of chemicals recently entered as new chemicals. Thus, KOSHA now provides a comprehensive information service for a total of 50,300 types of chemicals.

**MSDS DB utilization cases**

| | Total | 2001 | 2000 | 1999 | 1998 |
|---|---|---|---|---|---|
| No.of times accessed | 504,903 | 249,190 | 163,244 | 48,489 | 43,980 |

# 2001 Annual Report





**Major project**

**4. Prevention of Accidents at Construction Sites**

Due to the characteristics of the construction industry, construction processes and procedures are complicated and working environments frequently change. Since they often involve underground or elevated level work sites, the construction industry's working environments have inherently greater risks than other industries. The number of construction workers occupies approximately 19~20% of all industrial workers; however, the number of fatality accounts for 24% or the highest rate of all Industries. This may be attributable to workers' lack of skills or frequent movement to other job sites.

To effectively prevent workplace accidents, KOSHA is launching a wide variety of accident prevention programs that consider the scale and type of projects, locality, and risk characteristics.

**Accidents by year (Unit: persons, %)**

| Year | All industries | | | Construction industry | | |
|---|---|---|---|---|---|---|
| | No. of casualties | No. of fatalities | Casualty rate | No. of casualties | No. of fatalities | Casualty rate |
| 2001 | 81,434 | 2,748 | 0.77 | 16,771(20.6) | 659(24.0) | 0.69 |
| 2000 | 68,976 | 2,528 | 0.73 | 13,500(19.6) | 614(24.3) | 0.61 |
| 1999 | 55,405 | 2,291 | 0.74 | 10,966(19.8) | 583(25.4) | 0.60 |

**4-1. Safety assessment program at large construction sites**

KOSHA examines "harmfulness and hazard prevention plans" submitted by construction company as part of its efforts to preliminarily secure workplace safety. For five construction projects-buildings 31 or more meters height, bridges with a span of 50 or more meters, dams measuring 50 or more meters height, and tunnels and excavation work 10.5 or more meters deep--KOSHA conducts safety inspections based on the harmfulness and hazard prevention plan submitted by the contractors. KOSHA has focused its examination on the appropriateness of the safety and health programs in reducing or eliminating hazardous working environments.

KOSHA is making an ongoing effort to ensure workers' safety and health by periodically inspecting work sites to verify that the submitted safety plans have actually been implemented.

**Examinations and inspections (Unit:sites)**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Examination | 1,234 | 866 | 786 |
| Inspection | 4,974 | 4,415 | 4,599 |

There are 6 Social Overhead Capital construction projects- subways, rapid railways, express highways, power stations, dams, and ports with a high rate of accidents, including collapses. KOSHA manages these construction projects differently according to their rate of accidents and safety grade.

If a site has no accidents for 18 consecutive months, the site is assigned a Blue grade for voluntary management. If any construction site records an accident rate that is less than 1.5 times the average accident rate of similar sites, KOSHA classifies it as a Yellow grade and provides technical guidance. For construction sites recording an accident rate that is 1.5 or more times the average accident rate of similar sites, KOSHA assigns a Red grade site and the site is subject to receiving special supervision and technical support from the Ministry of Labor.

**S.O.C construction site technical assistance provided by year (Unit:sites)**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Yellow grade | 263 | 377 | 172 |
| Red grade | 30 | 74 | 65 |

**4-2. Self-regulatory safety management**

Unlike the manufacturing industry, a construction business is managed separately by the head office and site office. To ensure worker safety, it is necessary to integrate the safety management system with the site and headquarters, rather than merely having an on-site safety management system.

In accordance with this, KOSHA developed and distributed Construction Industry KOSHA 2000 Program a safety and health management system, to 3 big construction companies. It is expected to promote the levels of safety and health activities at the construction site to help develop a safety and health management system at the construction companies' headquarters.

To upgrade the levels of accident prevention activities, KOSHA systemized the operation of a safety management program, which recognizes safety and health as an element of corporate management by issuing certificates through consulting and assessment of companys' management system.

The safety management system of the construction industry is below an acceptable level. To assist construction companies to develop their voluntary safety and health activities, KOSHA received applications for technical support from construction contractors and provided free technical assistance and training to 1,502 construction sites.

Considering this fact, KOSHA has originated a cooperative system with related agencies to promote safety activities of construction companies. In addition, KOSHA held a presentation of the cases of site-safety activities and chose good examples applicable for construction sites.

To enhance safety technology levels, KOSHA has also developed and supplied technical materials and safety procedures for many hazardous works, including reinforced concrete work, steel structure work, boring and grouting works, stone works, and painting. KOSHA will continue to promote worker's safety and provide construction companies with technological assistance and other services.

**4-3. Accident prevention for falls and temporary facilities**

As in other advanced countries, accidents caused by falls recorded the highest cases of accidents in the Korean construction industry. In 2001, there were 301 fatalities (45.7%) caused by falls among the 659 fatalities in the construction industry, a higher level than that of other advanced countries. KOSHA has examined safety facilities used at construction sites where is vulnerable to falls, such as apartment building and school construction sites. KOSHA has inspected installments and compliance with the related standards of 8 major temporary facilities, including the working plank, safety guardrail, padders, safety nets, and other temporary structures and provided technical assistance where necessary. KOSHA designated April as "fall-prevention month" and encouraged construction companies to voluntarily launch their own fall-prevention campaigns at that time.

KOSHA sought to activate accident prevention management at sites and improve fall-prevention techniques through technological seminars attended by construction job-related workers. It also conducted, on a periodic basis, fall prevention group training suitable to the construction Characteristics of various fields.

Compared with other industries, construction workers lack safety awareness. To enhance workers' awareness regarding personal protective equipment, KOSHA developed a harness-type light safety belt that can prevent a secondary wound in a fall. KOSHA distributed 10,000 safety belts free of charge to workers at small construction sites.

During 2002, KOSHA will concentrate on preventing fall accidents at construction sites. For large construction sites with potential fall risks, KOSHA plans to make special technical assistance for sites individually. On the other hand, KOSHA will install basic safety facilities--working plates and guardrails free of charge at small-sized construction sites. KOSHA will develop and distribute safety guidelines and technical manuals in accordance with the work for high fall risks, while strengthening safety training for workers.

**4-4. Technical assistance provided to sites with many accidents**

Compared with large construction sites, the small-sized construction sites where overall construction cost is less than 10 billion won generally lack employee's safety awareness and self-regulatory management capabilities. KOSHA assisted the uninformed inspections of the Ministry of Labor at 501 small-medium construction sites to point out potential accident factors, enabling each workplace to voluntarily improve safety management based on the technical improvement programs presented by KOSHA.

To find out and remove hazardous factors, KOSHA joined with the Ministry of Labor to conduct inspections of 2,005 construction sites with high risk. These workplaces were susceptible to cave- ins, collapse of supports and form works, flooding, electric shock, and fire. Thawing, rainy season, and winter exacerbated the accident potential of these sites.

The small construction sites with construction costs less than 300 million won generally lack safety management organizations or systems. In most cases, work is completed within 3 to 6 months with the building owner being directly involved in construction. This leads to many accidents because building owners often have little or no experience in implementing safety procedures.

KOSHA provided safety and health-related technical assistance to 6,129 small sized construction sites, encouraging building owners to improve their safety consciousness and upgrade safety management levels.

**Technical assistance provided to sites with many accidents (Unit:sites)**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Inspection, and supervisory technical assistance by construction safety patrol | 501 | 5,203 | 4,550 |
| Inspection and supervisory guidance during high risk seasons | 2,005 | 2,726 | 2,864 |
| Technical assistance provided to small construction sites | 6,129 | 1,856 | 1,154 |

# 2001 Annual Report





**Major project**

**5. Fundamental Safety Support**

Industrial facilities and equipment continue to become more advanced, automated, and systemized. Risks are increased as equipment becomes more complicated to operate. It is often difficult to discover potentially hazardous conditions in today's complex equipment systems, but operator's carelessness is usually a contributing factor to industrial accidents.

The safety management system that relies on alerting workers, safety work training, and training aimed at minimizing unsafe acts is not enough to completely ensure safety and reduce industrial accidents.

In order to secure fundamental safety of dangerous machines, equipment and facilities, KOSHA introduced and implemented safety inspection of dangerous machines, equipment and facilities, performance test of safety devices and personal protective equipment, and establishment and dissemination of Process Safety Management (PSM) system and Integrated Risk Management System (IRMS) at chemical plants, pursuant to Articles 33, 34, 35, 48 and 49-2 of the Occupational Safety and Health Law.

**5-1. Inspection of harmful or hazardous facilities, machinery and equipment**

Since July 1, 1991, KOSHA has implemented inspection on 6 types of dangerous machines and equipment, including cranes, with a high potential for accidents.

Under this inspection system, all manufacturers, importers, installers and users are required to undergo 3 stages of inspections. These include design inspection prior to manufacturing, completion or performance inspection after manufacture (or inspection during the process of manufacture in the case of pressure vessels), and periodic inspections during use.

A site real-name inspection system has been implemented to ensure prompt evaluation and judgment, and an inspector qualification system has been added to improve the qualifications and consistency of inspectors. Furthermore, to ensure inspectors' reliability and to make scientifically sound inspections, KOSHA operates approximately 2,000 items of the latest inspection equipment including industrial endoscopes, ultrasonic detectors, wire rope testers and press knockoff peformance testers.

In a bid to improve inspection technologies and strengthen the status of inspection agencies, KOSHA participates in the ISO and IEC meetings, exchanges information with overseas inspection agencies, and dispatches staff overseas for regular training to learn and distribute advanced inspection technologies.

**Kinds of inspection (Unit:cases)**

| | Total | Design inspection | Completion inspection | Performance inspection | periodic inspection |
|---|---|---|---|---|---|
| 2001 | 59,523 | 6,621 | 15,255 | 7,337 | 30,310 |
| 2000 | 59,393 | 5,976 | 13,637 | 7,670 | 32,110 |
| 1999 | 48,931 | 4,105 | 10,939 | 4,871 | 29,016 |

**Inspection objects (Unit:cases)**

| | Total | Crane | Lift | Pressure vessel | Press and shearing machines | Roller |
|---|---|---|---|---|---|---|
| 2001 | 59,523 | 30,176 | 5,360 | 22,901 | 1,075 | 11 |
| 2000 | 59,393 | 30,000 | 5,103 | 23,162 | 1,107 | 21 |
| 1999 | 48,931 | 22,061 | 5,091 | 18,854 | 2,876 | 49 |

**5-2. Tests for safety devices and personal protective equipment**

In case the safety devices and/or protective gear attached to dangerous machines and equipment carry any defects, such devices or gear may cause accidents to workers. To protect workers from faulty safety devices and protective gear, KOSHA tests the material quality, structure, peformance, and durability of newly manufactured

or imported products. Based on such tests, KOSHA issues certificates of product models.

Sixty-eight products are subject to performance test. It includes 15 kinds of safety devices for dangerous machines and equipment such as safety devices of press and shear, safety valve of pressure vessel and boiler, 12 kinds of explosion-proof electric equipment such as motors, controllers and lighting equipment, 30 kinds of temporary construction support such as pipe supports, frame scaffolds and clamps, 11 kinds of protective gear such as safety shoes and safety helmets. After a model is approved, KOSHA randomly collects safety devices and protective gear to verify and maintain the same quality as they did at the time of model approval.

KOSHA has conducted 4,924 performance tests from 1999 to 2001, with collective tests accounting for 16% (290 cases) of the 1,766 cases of performance testing in 2001.

**Peformance test conducted (Unit:cases)**

| | Total | 2001 | 2000 | 1999 |
|---|---|---|---|---|
| Performance test conducted | 4,924 | 1,766 | 1,734 | 1,424 |

The performance test system that KOSHA implemented from 1989 has greatly contributed to the improvement of the safety device and protective gear, KOSHA enhanced the technical levels of domestic manufacturers by continuously providing technical assistance in product design, manufacturing technologies, quality control and improving defect levels. Every year, KOSHA holds a safety competition and awards prizes for superior products. It also helps manufacturers hold exhibitions and advertise their products, inducing technology and quality improvement. In February 1999, KOSHA was designated as an authorized testing laboratory by the Korea Laboratory Accreditation Scheme (KOLAS) according to ISO 17025 which is the international evaluation standard for the competence of testing and calibration laboratories for 137 test items including explosive strength tests on safety devices and protective gear. In order to maintain the trace ability of the testing and measuring equipment, KOSHA seeks designation as an authorized calibration laboratory for 8 calibration items in the length sector including height gauges.

All KOSHA test reports will be recognized by the testing laboratories of all countries participating in a mutual recognition agreement with KOLAS because KOLAS made a mutual recognition agreement with the International Laboratory Accreditation Conference and Asia Pacific Accreditation Corporation.

Regarding explosion-proof electric machines and equipment, 22 countries, including Korea, have joined IECEx Scheme, and the Assessment & Test Reports issued by the Accepted Certification Body and the Explosion Testing Laboratory recognized by the Explosion Management Committee are accepted among member countries without undergoing separate tests.

KOSHA engages in related work as an agency representing Korea, and was designated as the world's 5th explosion-proof certification body and explosion-proof testing laboratory in June 2000. KOSHA will host the 2002 IECEx Scheme International Conference in Seoul in October 2002

**5-3. Review and Implementation assistance on the Process Safety Management system**

As the industry continues to develop, new chemical substances are being utilized at work sites and the facilities themselves have become increasingly complex. The accident potential and the scale of personal and physical damage caused by accidents have also increased and the desire of workers to experience a safe work environment has intensified.

Hence, it has now become necessary to implement scientific safety management systems of chemical plants. KOSHA reviews the process safety report submitted by the business owner who owns, or has installed new plants vulnerable to major industrial accidents.

KOSHA also provides technical assistance to confirm the results of these reviews. Starting in January 1995, KOSHA began to implement the Process Safety Management system which is self- regulated to prevent major industrial accidents.

Under the Process Safety Management system, all workers attempt to discover and remove voluntarily the potential hazards of dangerous facilities, and devise an economical mitigation plan to minimize the consequences from accidents.

**Review and Confirmation (Unit:cases)**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| No. of process safety report reviewed | 241 | 162 | 342 |
| No. of confirmation of process safety report | 297 | 423 | 447 |

**5-4. Establishment of Integrated Risk Management System for chemical plants**

Fires, explosions, and the leakage of hazardous materials in chemical plants occur due to various kinds of complicated accidents. It is difficult to predict when or why these accidents take place. Also, an accident that occurs at an individual workplace may lead to chain-reaction accidents causing< enormous personal and property damage, leading to extensive, economic effects.

To effectively cope with these situations, KOSHA developed an Integrated Risk Management System (IRMS)

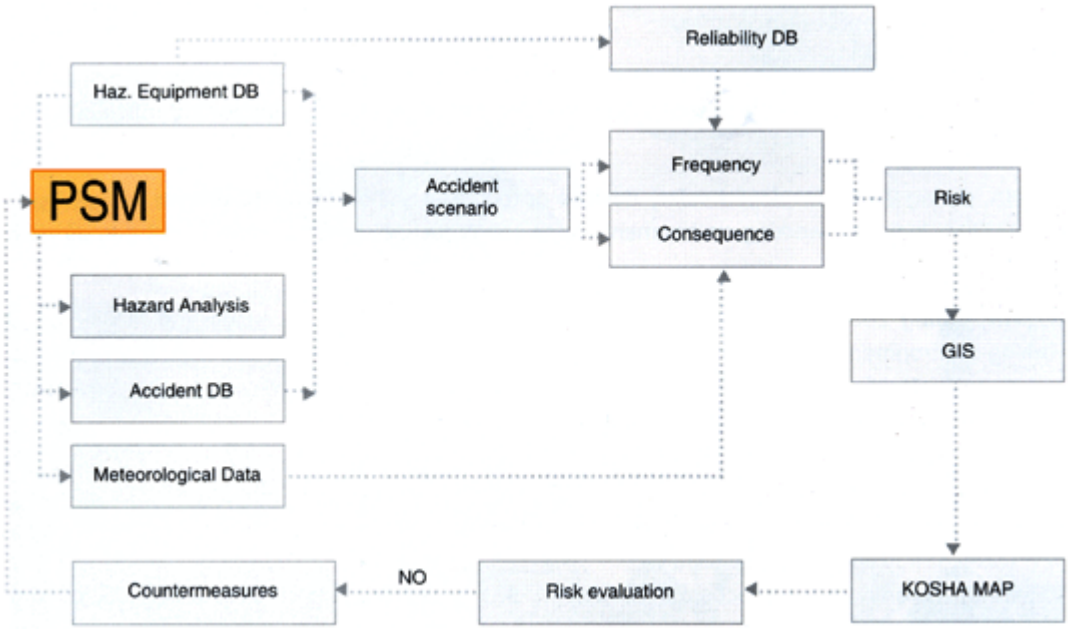
covering dangerous equipment. This is an effective prevention mechanism to prevent major industrial accidents such as fires, explosions and the leakage of toxic materials.

IRMS has been conducted mainly for the petrochemical complexes in Ulsan, Yocheon, Onsan, Daesan and Incheon during the period from 1998 to 2002 (5 years). IRMS consists of a dangerous equipment DB, accident scenario selection program, calculation of accident, dangerous equipment reliability DB, and a Risk Map that indicates the damaged areas and the risk level in GIS.

In 2001, the IRMS program was completed and is being used as a test version by local governments, industrial complexes, and other workplaces. During 2002, the program will be supplemented for wider application.

Meanwhile, at an OECD Seoul workshop held in Seoul in June 2001, IRMS was recommended by the OECD members as an advanced risk management model.

**Structure of IRMS**



# 2001 Annual Report





**Major project**

**6. R&D Related to Occupational Safety and Health**

KOSHA operates the Occupational Safety and Health Research Institute to perform short-and-long term R&D activities to prevent industrial accidents. It also operates, whenever deemed necessary, a Task Force Team to develop technologies related to the improvement of risk factors of work site.

The Institute conducts research into safety and health policies and systems, and safety engineering sectors such as machines, electricity, chemical engineering and construction. It also carries out research activities in industrial health sectors like working environment, occupational diseases and toxic chemical materials. KOSHA organized a Task Force Team composed of regional and area office technical personnel who are well acquainted with local situations. Starting

in 1999, the Team began to develop and distribute safety devices, technical standards and working environment improvement technologies covering the machines and facilities caused a lot of fatal accidents or injuries.

**6-1. Development of safety devices for dangerous facilities and working environment improvement technologies**

From 1999, KOSHA began development and distribution of practical safety devices for employees and working environment improvement technologies for application to dangerous machines and facilities.

KOSHA, during 2000, developed safety devices or technical standards for 10 dangerous machines and facilities, including working environment improvement technologies covering 16 dangerous work processes.

KOSHA, during 2001, developed safety devices for 10 dangerous machines and facilities and working environment improvement technologies for 14 hazardous work processes. In order to ensure safe electrical work, KOSHA also developed an electric alarm device for cranes, which detects the presence of live electrical wires, and a ground status indicator.

KOSHA has applied for patent or utility model rights covering 81 development cases of safety devices and working environment improvement technologies. Patent or utility model rights have been acquired thus far in 45 cases.

KOSHA is currently in the process of developing safety devices for 10 dangerous facilities and improving working environment technologies for 9 harmful work processes in 2002.

Additionally, safety devices and working environment improvement technologies will be developed every year and will help systemize each workplace.

KOSHA includes or supplements the developed safety devices and working environment improvement technologies into KOSHA Code, the technical guidelines related to Korea's industrial safety and health, so that everyone has easy access to the technologies. In addition, related information is available in video or CD-ROM format or technical materials as a type of one page sheet for free distribution to workplaces and other interested persons. When a workplace requests technical support or training, KOSHA visits the site and actively supports their safety efforts.

**6-2. Industrial safety research**

Industrial safety research is being carried out with an emphasis on the advancement of accident prevention technologies that can be practically applied to each workplace after collecting opinions about the technologies' appropriateness for each application. KOSHA invites outside experts to carry out joint research in order to effectively operate a research project team and conduct researches according to priority. KOSHA propagates the result of research through domestic and overseas academic activities, while pursuing the globalization of research activities by participating in international exchanges with advanced research institutes.

Regarding machine safety, KOSHA works to fundamentally prevent accidents caused by machines or facilities by developing systems for removing dust and noise from workplaces. It also conducts research on the degree of risk from dangerous machines and related product liability KOSHA developed safety devices for agricultural and forestry machines and is distributing related technical materials. To reinforce safety in electrical works, KOSHA developes electric shock prevention and grounding techniques for use in related workplaces and agencies.

In the case of chemical engineering, KOSHA seeks safe materials by interpreting the pyrolysis characteristics of the chemicals used at industrial sites, and developing human error forecasting techniques that draw increasing attention at job sites. It has developed and is distributing a defect recording system that can effectively analyze the risks of chemical processes. KOSHA also intends to develop risk evaluation techniques that can determine the priority of installing safety facilities in laboratories and investment for distribution to related industries, research institutes, and college laboratories.

To improve construction safety, KOSHA concentrates on the prevention of frequently occurring accidents, such as falls, drops, and collapses. In addition, KOSHA strives to promote the safety management capability of construction sites through research into the practical performance evaluation techniques and the development of safety information system at construction sites. In addition, KOSHA analyzes the effects of the harmfulness and hazard prevention plan system applied to construction sites to improve this system and promote voluntary safety management.

**6-3. Research into the industrial health**

Industrial health and hygiene research has been undertaken to improve working condition and to promote workers' health by conducting worker's exposure monitoring and by revealing the relationship between the monitoring results and occupational diseases. Most of all , contribution to the fundamental control measures to tackle occupational diseases achieved from the thorough analyses of the manufacturing process, job-related and possible risks in the process.

In this year, Department of Health Hazard Research focused its research efforts on the management of working environment and worker's health in construction industries and traffic firms, the prevention programs on occupational celebro-cardiovascular diseases as well as musculoskeletal diseases, and the development of monitoring tools to measure job-related stress for Korean workers.

Other research activities include health hazard evaluation programs and an exposure monitoring program to endocrine disrupting chemicals. Every research outcomes have been disseminated to all stake holders in the country and most of the results contributed to construct national strategies in terms of improving working condition and controlling health hazards in work sites.

During 2001, Center for Occupational Disease Research conducted researches on the working environment and health of the workers exposed to methyl bromide, on the health of the workers exposed to benzene and toluene based on genetic polymorphism and immuno-reaction, and on the analysis of the metabolites of chlorinated hydrocarbons. Subjects of research include the job risks and the musculoskeletal disease of electric and electronic manufacturing workers, and the working environment and health effects of the workers at a foundry

The Occupational Epidemiological Survillance Team developed a pulmonary function forecast system to prevent occupational disease. This is to reduce the degree of error caused by the use of the forecast system developed for foreigners, promoting reliability and accuracy in diagnosing occupational respiratory disease and pneumoconiosis.

KOSHA also established occupational disease preventive measures by evaluating the level of exposure to carcinogenic substances (PHAs) at coal tar-containing paint manufacturing or handling plants. This is expected to facilitate the selection of occupational cancer occurrence risk groups.

**6-4. Occupational toxicity research**

Occupational toxicologic research is conducted to experimentally examine the inherent harmfulness of new and existing chemical substances used at worksites. The research also provides a basis for regulation of workplaces in the manufacture and use of chemicals and the scientific data to prevent workers' occupational diseases.

The occupational toxicologic research is carried out by Center for Occupational Toxicology located in the Daeduk Research Complex. Starting in 1999, the Center began to conduct acute and semi-acute inhalation and acute oral tests and genetic toxicity tests (microbial reverse mutation test, chromosome aberration test, and micronucleus test) based on the principle of Good Laboratory Practice (GLP) established by the Ministry of Environment. The Center is an internationally recognized toxicity-testing center.

The main facility of this center consists of animal care systems and cell culture rooms equipped with a barrier system, and an international-caliber inhalation laboratory equipped with state-of-the-art inhalation chamber capable of exposing organic solvents and particular substances. It also has analyzing equipment used to evaluate substance identification, and an electronic microscope featuring EDX that can analyze asbestos and other mineral fibers.

Currently, the Center is conducting researches to develop a toxicity evaluation index ofhemicals related to occupational safety and health, to establish a basis for setting exposure levels and classifying toxicity, and to perform international-class technical research and policy study to investigate the harmfulness of the new chemical substances. The Center also carries out fact-finding research to ensure reliability of the Material Safety Data Sheet of chemical substances.

**6-5. Safety and health policy reseorch**

The safety and health policy research involves the establishment of occuptional safety and health policies, analysis of the effects of political projects and research into system improvement. The research related to the establishment of policy includes improvement of the health management system and investigation into harmful

factors that would necessitate application of the Occuptional Safety and Health Law to workplaces with less than 5 employees. Meanwhile, the Center surveyed the status of complying with the 11 major safety and health rules to seek adequate policy improvement through the analysis of the effects of the political projects and analyzed the effects of providing safety and health technical assistance to small workplaces.

The occupational safety and health policy can be studied by examining currently available materials and information. The center plans to conduct basic policy surveys on a regular basis by developing an Industrial Safety and Health Trend Analysis System .

# 2001 Annual Report





**Major project**

**7. Accident Prevention Training**

Serious accidents occur every year in Korea, indicating a lack of safety awareness in all areas of society. Approximately 40% of all accidents occur due to lack of training indicating that overall safety awareness is extremely lacking in the society.

In order to promote safety awareness and support self-regulatory safety and health management, KOSHA operates user-oriented training programs that concentrate on reducing the causes of industrial accidents by educational factors.

Major training courses include a management seminar to promote safety mind of management, training for the owners of workplaces with less than 50 workers and special training to improve the working capabilities of safety and health managers.

There is also an on-the-job training program where employees can directly experience hazards and safety facilities at a job site. Also in-house safety and health training programs are provided to help small-medium enterprises that do not have appropriate materials or safety training environment.

**7-1. Training aimed at creating the self-regulatory safety management foundation**

KOSHA holds safety and health seminars for managements to establish self-regulatory safety management activities. KOSHA induces managements to invest in safety and health by promoting management's interest in safety and health activities, contributing greatly to the reduction of industrial accidents, and promoting corporate

competitiveness.

KOSHA supports to have managements be aware of the importance of safety and to build a self- regulatory safety and health foundation at workplaces by providing training program with the managements of 10 leading risky industrial sectors with less than 50 employees which accounted for 69.07% (statistics of the year 2001) of all industrial accidents. Training is centered on presenting cases of accidents, analyzing of their causes, and developing countermeasures.

**Self-regulatory safety management training (Unit:persons)**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Management safety and health seminars | 1,825 | 4,912 | 3,796 |
| Training for owners of enterprises with less than 50 employees | 18,164 | 22,421 | - |

**7-2. Fostering of safety and health specialists**

As part of a specialist-fostering program, to prevent accidents and occupational diseases KOSHA provides practice-centered special training and customized courses for safety and health managers, and supervisors of construction sites and manufacturing plants. KOSHA conducts in-service training to enable safety and health managers to effectively peform fieldwork.

To assist in the prevention of accidents caused by dangerous facilities and hazardous factors, KOSHA operates 45 specialized training courses. These courses are subdivided into machinery, electricity, chemical engineering, construction, civil engineering, health and hygiene according to the type of dangerous facilities and the causes of accidents.

KOSHA also operates a correspondence course by mail to reduce the working hour loss and economic burden of sending personnel for group training during working hours.

Starting in the latter half of 2001, KOSHA started cyber training programs (5 courses) through the Internet. This is to effectively keep up with social environment changes, such as development of the IT sector and the rapidly increasing number of Internet users.

**Training provided (Unit:persons)**

| | 2001 | 2000 | 1999 |
|---|---|---|---|

| | | 2001 | 2000 | 1999 |
|---|---|---|---|---|
| Total | | 12,004 | 10,836 | 8,688 |
| In-service training course | | 534 | 573 | 552 |
| Specialist training course | | 7,187 | 6,761 | 4,348 |
| Correspondence course | Mail | 4,057 | 3,502 | 3,788 |
| | Internet | 226 | - | - |

**7-3. On-the-job safety training**

KOSHA provides free on-the-job training for construction safety to help workers recognize the work- related risks and the necessity of complying with safety regulations. This involves 4 hours of experiments and practical training on 20 kinds of subjects for the construction workers and supervisors. It includes the use of the safety belt, fall-prevention nets, and safety helmets.

KOSHA installed its first construction safety on-the-job training center in 1997, 2 additional sites during 1999, and 1 additional site in 2001. KOSHA plans to install 1 more center during 2002.

95.7% of the trainees expressed their satisfaction about the result of training, saying, "The training has helped promote my safety awareness".

Another effect of the on-the-job training is that many workplaces (49 places) operate their own simplified on-the-job training centers to promote safety awareness of their workers.

**On-the-job training provided (Unit:persons)**

- 

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| On-the-job training for construction safety | 23,733 | 20,246 | 25,419 |

In March 2001, KOSHA opened a Virtual Safety Training Center The Center is an advanced training facility where viewers can use computer based virtual reality technology to tour the workplace in an industrial site where harmful and dangerous work (press operation, etc.) is being perFormed and discover the risk elements through real-time 3D images.

Also, viewers can experience hazards and the process of accidents at plants or construction sites through a computer- graphic 3D video.

The 30-seat Virtual Safety Training Center is located on the 1 st floor of KOSHA headquarters. KOSHA operates 3 videos showing the manufacturing site, and 8 types of virtual reality work operations such as press, welding, conveyor and transporting work, etc.

The video presentation, which lasts 50 minutes, was provided to workers at workplaces, safety and health managers, and the general public (including students).

This training was provided free of charge to 13,911 persons. During 2002, KOSHA plans to operate a virtual safety system within the construction Safety on-the-job training center in 3 rural areas.

**7-4. Safety and health training considering reqionol chnrocteristics**

KOSHA operates 17 mobile safety training buses (2 additional buses in 2002 and 2003) equipped with audiovisual equipment and materials for workers at manufacturing and construction sites that cannot provide their own safety training due to lack of space and/or instructors for the safety and health training. The mobile safety training bus visits each workplace to conduct on-site training.

When requested by small-medium enterprises that are unable to conduct their own training, KOSHA dispatches safety and health instructors free of charge, Meanwhile, 19 regional and area offices have independently developed training programs covering port stevedoring safety taking into account of the regional situation, industrial structure, and the characteristics of accidents that have occurred. These training programs are offered to supervisors and workers.

**Safety and health training considering regional characteristics (Unit:persons)**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Mobile safety training | 90,315 | 91,992 | 97,063 |
| In-house training | 57,323 | 125,220 | 145,551 |
| Regional specialization training | 10,377 | 10,081 | 6,501 |

**7-5. Safety training at school**

To effectively prevent accidents, all people should have positive safety awareness; and voluntarily participate and cooperate in the prevention of accidents. The primary, middle, and high school students as well as infants are sensitive by nature and are in the process of acquiring knowledge and a sense of right and wrong. It is important to have these students and infants systematically form a safety consciousness and develop safe habits.

Starting in 1991, long before the Safety Culture Movement started full scale operations in 1995, KOSHA had school textbooks include safety training materials, and conducted training for the students and teachers of primary, middle and high schools. The primary purpose was to prevent accidents at schools and increase the effects of all-round training for students. It also instilled in them the importance of accident prevention and good health, and prepared them for a lifetime of involvement in safety.

As part of the school safety training program, KOSHA conducts free of charge, training courses for 2 days (16 hours) for the teachers of kindergarten and primary schools, and the students parents to foster safety culture instructor who fulfilled with qualifications and moral influence. For technical high school students who will work at various industrial sites in the future, KOSHA provides training and its materials related to fundamental safety and health knowledge and accident prevention.

To prevent accidents at schools and to teach safety awareness and attitude to students through school courses and safety activities, KOSHA operates a model safety school designed by the city and provincial administration of education. KOSHA provides all training materials and instructors required for operation, conducts safety inspections, and supports the operational budgets.

**School safety training (Unit:persons)**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Kindergarten teacher training (Safety instructor training) | 1,367 | 721 | 906 |
| Training for technical high school students | - | 8,111 (31 schools) | 9,451 (35 schools) |
| Designated model safety training school | 64 schools | 16 schools | 16 schools |

# 2001 Annual Report





**Major project**

**8. Expansion of Safety Awareness**

In order to promote the safety awareness of workers and employers and establish a nationwide safety culture, KOSHA is launching public relations and safety culture movement through a variety of media outlets.

KOSHA uses TV, radio and other broadcasting media, subway, electronic bulletin boards, theater commercials and other media to publicize industrial accident prevention. Each July, KOSHA holds the Week of Occuptional Safety and Health to enhance the safety awareness of workers and business owners.

KOSHA also holds a Safety Inspection Day event on the 4th of every month, operates a model safety school, and other safety culture projects to establish a nationwide safety awareness.

KOSHA plans to construct a Safety and Health Exhibition Hall where visitors can receive safety training and obtain information on safety culture. KOSHA presents certificates of achievement to enterprises that attain their accident-free target.

**8-1. Annual event for the Week of Occupational Safety and Health**

KOSHA, together with the Ministry of Labor, holds the Week of Occuptional Safety and Health> events every year pursuant to the Occupational Safety and Health Law This is to reward persons related to occupational safety and health for their meritorious service in the prevention of industrial accidents.

An accident prevention atmosphere accompanies this campaign by arranging a plaza for the exchange of

accident prevention technology and free discussions.

Such events have created a turning point for the expansion of a safety culture that promotes the quality of life by increasing national awareness of safety and accident prevention.

The Week of Occupational Safety and Heaith events are classified into 3 major categories.

First, the Occupational Safety and Health Convention is launched to reward persons related to safety and health for their services and promote national safety awareness. This convention is held on July 1 each year.

Second, an International Safety Devices, Working Environment Improvement, and Fire-fighting Industry Exhibition is held to present superior accident prevention technology and information by comparing and displaying superior safety and health-related machines and products. In 2001, 189 firms from 16 countries participated in this Exhibition, making it an international Exhibition for safety and health equipment.

Third, a specialized seminar is held under 11 themes, including safety and health, to introduce new field-oriented techniques and technology related to safety and health, and to exchange information. This seminar has provided attendants with an ideal opportunity to exchange accident prevention techniques.

From June 1 to June 30, all workplaces across the country, and institutions and organizations related to safety and health carry out self-regulatory accident prevention activities. Such activities include seminars, academic forums, accident prevention campaign meetings in each workplace, implementation and rewarding of the safety and health suggestion system, and industrial accident prevention training. Accident prevention consciousness at all Korean workplaces will be concentrated on July 1 when the Occupational Safety and Health Convention is held.

The Week of Occupational Safety and Health events thus offer a special opportunity for all people to establish safety as their No. 1 sense of value. These events are participated in by the persons related to safety and health, concerned citizens, women's organizations and teachers, students, and union representatives to create a national consensus on occupational safety and health.

**8-2. Public relations through media**

To promote the safety awareness of workers and employers, and to expand the national safety culture atmosphere, KOSHA provides safety and health information and publicizes the accident prevention activities launched by KOSHA through a variety of media.

The publicity activities are carried out by KOSHA mainly through the broadcasting, daily media and printed materials.

In the case of publicity activities through broadcasting media, in order to enhance publicity effects, KOSHA compiles safety activities with various materials based on which safety can be practiced through TV, radio and CATV, and simultaneously broadcasts related materials to all areas of the country. KOSHA is making every effort to create a national consensus on safety through special TV programs related to occupational safety and health.

KOSHA utilizes diversified daily media, such as the theater commercials in heavily populated areas, subway advertisements, bulletin boards, large TV screen advertisements, and advertisement towers. These activities target a mass audience to encourage widespread development of safety awareness.

In respect to press media, KOSHA holds a social gathering related to accident prevention and participants include members of the press corps, executive members of news companies, and TV drama writers. This seeks their understanding of the major projects being implemented by KOSHA and strengthens the relationships in order to encourage social interest and participation in safety.

Along with this, KOSHA launches active publicity efforts to promote safety awareness and accident prevention among the workers and owners of workplaces with less than 5 employees that lack the safety and health foundation.

Furthermore, KOSHA operates a publicity hall at the KOSHA headquarters that utilizes advanced display techniques to promote and educate the public about the safety message. KOSHA plans to construct a Safety and Health Exhibition Hall to provide training to workers and owners to promote their interest in safety and health.

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Publicity through broadcasting media (parts) | 352 | 237 | 92 |
| Publicity through daily media (places) | 405 | 94 | 106 |
| Publicity through press media (times) | 3,244 | 3,633 | 4,412 |
| Publicity hall audience (persons) | 11,663 | 2,738 | 2,905 |

**8-3. Accident-free campaign at workplaces**

(1) Management of participants

Owners desiring to launch an accident-free campaign must first inform all workers of its intention to take part in the campaign at the time of safety training or during regular morning calls. In addition, the owner should announce the beginning of the accident-free campaign at each workplace by means of bulletin boards installed

on-site or by publishing in the company news.

The owner must report the commencement of the accident-free campaign to KOSHA's regional and area offices within 14 days from the date of commencement.

KOSHA provides each workplace implementing the accident-free campaign after reporting the commencement thereof with all training materials and information, and the accident-free campaign techniques required to implement it.

KOSHA provides all support to revitalize the accident-free campaign at each workplace, if necessary, and conducts the accident-free campaign implementation training for workers at relevant sites.

(2) Rewarding workplaces achieving targets

When, after reporting the commencement of the campaign, a workplace completes the required number of days (hours), the workplace reports the fact to a relevant regional office or area office within 60 days from the date targets.

Within 14 days from the date a report of achievement is received, the area office will conduct an examination to determine the appropriateness of the type of business, the established number of target accident-free hours, the calculation of the number of target days (hours), and if there had been any accidents.

If no discrepancies are found, the area office notifies KOSHA and the local labor office of the results of examination. The local labor office and KOSHA then present an accident-free certificate to the workplace through the area office, and provide other benefits in return for this achievement.

(3) Development and distribution of accident-free campaign technique

To revitalize and effectively push the accident-free campaign, KOSHA has developed and distributed to each workplace helpful techniques including a 4-round risk predicting technique, one-point risk predicting exercise, near accident cases. Each workplace modifies the technique to best suit its situation .

Of the techniques distributed so far, the Occupational Safety and Health Training Institute uses the 4-round risk predicting technique, one-point risk predicting exercise, and one-person risk predicting technique to educate supervisors at each workplace through the accident-free campaign courses used to foster accident-free campaign specialists. These techniques are widely used in all workplaces as the primary method of implementing the accident-free campaign.

**8-4. National safety culture movement**

As industry continues to develop, the industrial structure has become more complicated and diversified, and there are frequent unexpected accidents occurring around us. During the 1990's in particular, there were many serious accidents - the sinking of ferry in the West Sea, Sungsoo Bridge collapse, Subway explosion in Daegu, Ahyundong gas explosions and the Sampoong Department Store collapse--that generated shock as well as anger. Such accidents not only take away the most valuable life and health of mankind, but also hinder the national development because of the resulting enormous economic losses.

In connection with this, the government established a 5-year plan (1993~l997) to create a safe and pleasant social environment by preventing accidents and industrial disasters, and to reduce Korea's accident rate to that of the advanced countries during the first decade of the 21st century. Starting in the latter half of 1995, the government implemented the safety culture movement participated in by civilian, government and other related organizations covering all social sectors.

The safety culture promoting body is composed of 7 government and 7 civilian members, and 1 secretary. The 7 government members include the Prime Minister (Chairman), the Minister of Education and Human Resources Development, the Minister of Government Administration and Home Affairs, the Minister of Commerce, Industry and Energy, the Minister of Construction and Transportation, the Minister of Science and Technology, the Minister of Labor and the Director of the Office of Administration and Coordination for Prime Minister.

The 7 civilian members include the Chairman of the Korea Employers Federation, the Chairman of the Federation of Korea Trade Union, the Chairman of Korea Broadcasters Association, the Chairman of the Construction Association of Korea, the Director of the Insurance Supervisory Service, the Representative of the Citizens Coalition for Economic Justice and the Chairman of Korean National Council of Women.

The safety culture implementation committee, beginning in April 1996, designated the 4th (or on the following business day if the 4th falls on a holiday) of each month as the "Day of safety inspection." The project's purpose is to increase the safety awareness of people and provide monthly accident prevention and risk detection activities.

To prevent the "Day of safety inspection" from being applied only to certain social classes, KOSHA establishes slogans every year directed at the government that recognizes the importance of safety, the society that feels responsible for safety and the citizens who practice safety first.

The Safety Culture Implementation Committee leads the Safety Culture Campaign. In cooperation with the Citizen's Coalition for Safety, the committee operates a Safety Service Corps that can assist in saving lives and recovering facilities in case of large-scale disasters. Each of the 17 Safety Culture Implementation regional offices

runs a Safety Service Corps composed of volunteers. The Service Corps participates in safety campaigns, maintains safety order during normal times, and acts as members of rescue parties in case of an emergency.

**Major achievements**

- 

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Safety culture organization | 18 sites | 18 sites | 18 sites |
| Day of safety event | 303 sites | 512 sites | 925 sites |
| Operation of safety service corps | - | 1,724 persons | 1,724 persons |

**8-5. Publication and distribution of technical information materials**

In order to revitalize safety activities at workplaces and encourage self-regulatory safety management, KOSHA distributes necessary safety and health materials for each industrial sector to relevant workplaces. These materials include periodicals, pamphlets, posters, booklets, stickers and videos. Multimedia materials are aiso available via computer for easy access by management and workers.

Periodicals include monthly publications: Safety and Health, People Observing Safety, and biweekly Safety and Health Information. The monthly Safety and Health contains safety and health technologies and information required for self-regulatory safety management and is distributed to some 10,000 large and small workplaces. The monthly People Observing Safety is distributed to the honorary occupational safety inspector, the leader of workplace safety. The biweekly Safety and Health Information (50,000 copies) provides safety and health news and accident prevention information to small workplaces.

Special materials are published and distributed in various forms to promote accident prevention awareness of the management and workers. These materials also provide up-to-date information on safety and health technologies and safety activities. The safety and health materials can be classified into publications, including pamphlets, posters, booklets, and stickers, and audiovisual and multimedia materials. The audiovisual materials include video, Transparency Projector and display panels, which are used as training materials for safety and health education at workplaces.

Recently, KOSHA has developed and is distributing multimedia materials in CD-ROM and videotape formats to enhance the utilization of safety and health materials through computers.

Korea is experiencing a rising trend in foreign workers, so special technical materials are being developed to assist them in accident prevention. The safety and health materials developed for foreign workers contain accident prevention technologies related to accident-prone machines, equipment and facilities. These materials,

developed in the form of pamphlets, posters, video and display photo panels, also contain fundamental knowledge on industrial accident prevention for foreign workers. These materials have been translated into 8 languages: English, Chinese, Indonesian, Bangladesh, Vietnamese, Thai, Sri Lankan and Uzbekistani.

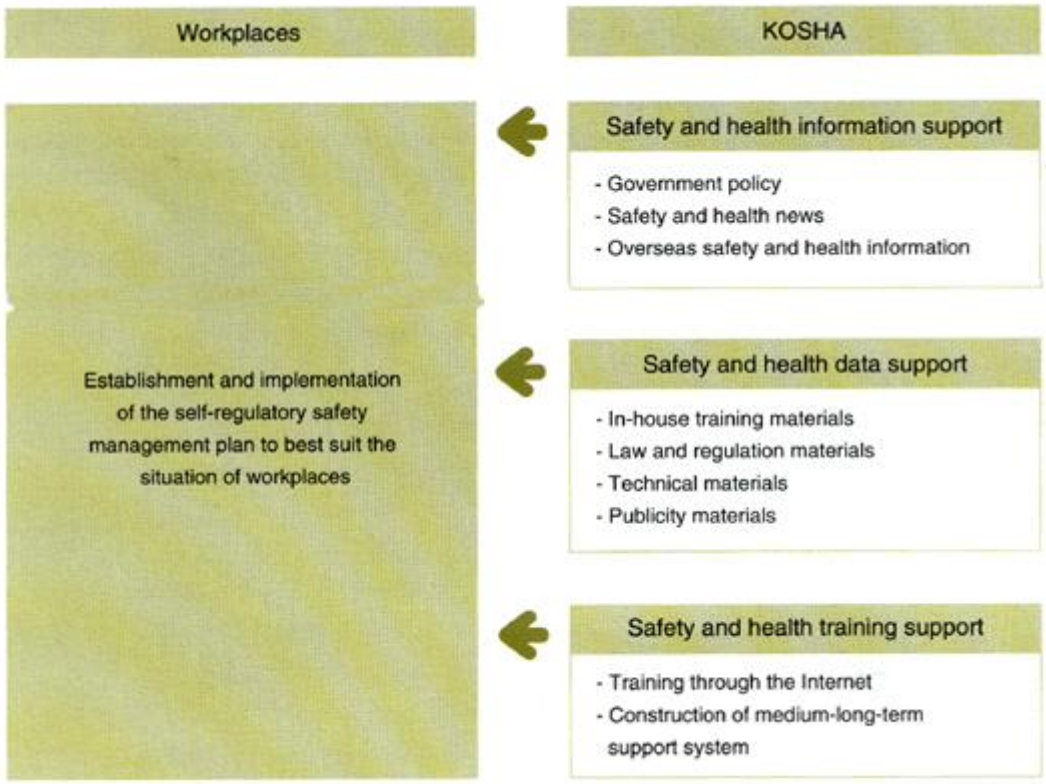
**Safety and health materials published (unit: types)**

| | 2001 | 2000 | 1999 |
|---|---|---|---|
| Total | 416 | 680 | 459 |
| Periodicals | 3 | 3 | 3 |
| Non-periodicals | 413 | 677 | 456 |

In addition, in order to ensure that voluntary safety management can be effectively implemented at medium and large workplaces, KOSHA operates a KOSHA voluntary safety club that provieds safety and health information, and materials required for safety management. The KOSHA voluntary safety club began operation in May 2001. Currently, these are a total of 970 members: 404 (41.6%) manufacturers and 566 (58.4%) construction companies.

KOSHA provieds monthly training materials, safety and health information, technical and publicity materials, and audio and visual training aids to member companies. KOSHA also offers safety and health news and other educational and technical materials through the Internet.

**Voluntary safety management support**


Workplaces
KOSHA
Safety and health information support
- Government policy
- Safety and health news
- Overseas safety and health information
Establishment and implementation of the self-regulatory safety management plan to best suit the situation of workplaces
Safety and health data support
- In-house training materials
- Law and regulation materials
- Technical materials
- Publicity materials
Safety and health training support
- Training through the Internet
- Construction of medium-long-term support system

# 2001 Annual Report





**Major project**

**9. International Cooperation**

The international trend in industrial safety and health is to strengthen self-regulatory safety and health management of enterprises and unify the international safety and health standards. In line with this, international trade regulations regarding the technical standards for protecting the life, health and environment of the importing nation and its people are being strengthened.

To cope with these changes, KOSHA is planning to introduce advanced technologies in all fields by entering into an agreement and building a cooperative partnership with foreign safety and health institutes and international organizations regarding the implementation of industrial accident prevention projects. At the same time, as a member of OECD, KOSHA plans to assist developing countries with Korea's accident prevention technologies.

**9-1. Cooperation with major advanced countries and organizations**

In order to introduce advanced accident prevention technologies, KOSHA is pushing cooperative projects in various fields with foreign accident prevention institutions.

As for cooperation between Korea and Japan, KOSHA entered into a cooperation agreement regarding occupational diseases with Japan on April 12, 1992. This agreement remained in force for 5 years, but in 1998 it was converted into a civilian cooperation based on the two countries' past relationship. From this new cooperation, KOSHA pursued cooperative projects with Japan Industrial Safety and Health Association. These projects included cooperative research of KOSHA staff in Japan, consultation of Japanese experts in Korea to provide consulting services and carry out other cooperative projects.

On December 9, 1996, an agreement was signed between Korea and the U.S. and for the 3 ensuing years, KOSHA dispatched 4 experts to the National Institute for Occupational Safety and Health (N10SH) to learn about the evaluation of health hazards and other related matters. One expert from N10SH visited KOSHA to provide consulting services. The 2nd stage agreement was signed on October 15, 1999 and will remain in force for another 3 years. In 2001, two KOSHA researchers were dispatched for research on i, Evaluation of cumulative traumatic disorders and the ergonomic improvements i[1] and i, Risk Assessment i[1].

Cooperation agreement on industrial safety was signed between Korea and Germany in July 1987. KOSHA introduced technologies in overall safety and health to build accident prevention system infrastructure, like inspections, test, training, regulations and statistics. This agreement expired in June 1994. Starting in 1995, the Korea-Germany cooperative project was converted to civilian level, and KOSHA introduced new technologies such as risk assessment and explosion-proof inspections from the German TUV Rheinland/Berlin-Brandenburg, Berufsgenossenschaft (BG) and Physikalisch- Technische Bundesanstalt. In 2001, KOSHA dispatched its experts in the fields of Investigation into the Causes of Electric Shock and Electric Fires for on-the-job training to introduce new technologies.

Starting in 2000, KOSHA sought to form a cooperative coalition with other North European countries such as Sweden and Finland. In April 2000, a 3-year agreement was signed with the National Institute for Working Life (NIWL) of Sweden.

Based on the agreement, cooperative projects are being implemented for exchanging technical information and joint researching for the 7 fields such as occupational disease diagnosis, epidemiological survey and women's work and health. During 2001, KOSHA experts were dispatched to study subjects covering i, Diagnosis of occupational disease and epidemiological research i[1], i, women's work and health i[1] and i, Non-ionizing radiation i[1]. Under a cooperative program with the Finnish Institute of Occupational Health (FIOH), KOSHA also dispatched its staff to study biological monitoring.

**9-2. Information exchange with international bodies and organizations**

KOSHA has cooperated with many foreign accident prevention organizations and international bodies to improve the domestic occupational safety and health levels and globalize safety and health technologies.

KOSHA signed a cooperation agreement with the world leading accident prevention agencies such as the National Safety Council of the USA, TUV Rheinland/Berlin-Brandenburg, Berufsgenossenschaft (BG) of Germany, Health and Safety Executive (HSE) of U.K. and Japan Industrial Safety and Health Association (JISHA). Under the agreement, KOSHA provided and acquired accident prevention technologies and information including latest policies.

In order to globalize safety and health, KOSHA also maintained good relationship with international organizations such as the International Labor Organization, International Standard Organization, Organization for Economic Cooperation and Development, and Asia-Pacific Occupational Safety and Health Organization and exchanged technologies and information and hosted international seminars. In 2001 in particular, KOSHA dispatched its staff to the agricultural safety and health sub- committee of the ILO.

KOSHA joined APOSHO in October 1988 and attended its annual general meeting to encourage balanced development of safety and health in the Asia Pacific region and to exchange information. The meeting also facilitated an exchange of information and understanding among all parties. KOSHA has acted as member of the Constitution Review Committee, the Occupational Safety and Health Management System Committee, and the Education and Training Committee, and operates the APOSHO homepage as Chairman of the Technical Committee.

From April 20 to April 25, 1998, the 14th APOSHO annual meeting was held in Seoul to promote the status of KOSHA. KOSHA staff participated in the 17th APOSHO meeting held in Taiwan in September 2001. KOSHA operated the Technical Committee, presented themes and carried out other activities. At the meeting held in Taiwan, KOSHA was re-elected as the Chairman of the Technical Committee from 2003 to 2005.

In April 2000, KOSHA participated in the 16th APOSHO meeting held in Mauritius and presented research papers and carried out other related activities including hosting the Technical Committee. In addition, KOSHA attended OECD general assembly meetings and other forums as Korea's representative in international activities related to the prevention of major industrial accidents. KOSHA held an OECD workshop in Korea in June 2001 under the theme of i, construction of an Integrated Safety, Environment and Qualify Management System i[1].

Since 1993, KOSHA has been participating in the Technical committee related to industrial safety and health of the International Standard Organization (1S0) and International Electro-technical Commission (IEC). KOSHA has always taken an active role in the meetings and is currently serving as a manager of the special committee and is Korea's representative. KOSHA is contributing to the establishment of international standards by organizing the exchange of technical information and presenting Korea's position in the formation of policies.

KOSHA takes part in many technical committees - Cranes (1S0 TC 96), Machine Vibration (1S0 TC 108), Air Quality (1S0 TC 146), Explosion-proof Inspection (1S0 TC 31), and Construction Equipment (1S0 TC 64), KOSHA hosted an international conference of IEC Explosion-proof inspection (TC 31) in Seoul during May 2001.

**9-3. Overseas training**

To promote the expertise and technical levels of KOSHA experts, KOSHA provides short and long- term training

to many of its staff. Training is mainly divided into short-term training aimed at acquiring new technologies related to accident prevention, and long-term training where KOSHA dispatches its staff to overseas master and doctorate courses to foster experts in accident prevention.

From January 1988 to December 2001, a total of 436 persons were dispatched for short-term studies to various places including the Chemical Plant Risk Management Center (CCPS) in the U.S. For long-term training, KOSHA sent 19 persons to the master and doctorate programs on industrial safety and health to many universities including Indiana University and South-California State University of the U.S., and Sheffield University of England. In 2001, KOSHA dispatched 47 staff to overseas training institutes, and there are currently 4 master degree students and 1 doctorate degree student attending U.S. universities.

KOSHA also visited related agencies in advanced countries to benchmark modern accident prevention systems, to discuss ways of providing mutual assistance, and to exchange technical information. KOSHA has attended international meetings dealing in industrial safety and health, international seminars and other related events to acquire a broad background of technical guidance that can be modified and implemented in domestic workplaces, thereby raising the standards of Korea's occupational safety and health.

**9-4. Contributions to Asian countries**

KOSHA made a commitment as a member of OECD to provide safety and health technology assistance to Asian countries. In September 1999, KOSHA entered into a 2-year agreement with Mongolia to provide on-site technical guidance, exchange information, and train visiting Mongolian safety personnel.

During 2001, occupational safety and health experts from the Ministry of Labour-Invalid and Social Affairs of Vietnam and Safety and Health at Work Promotion Association of Thailand were invited to Korea for 1-month training on overall occupational safety and health. Starting in 2002, KOSHA plans to invite 16 industrial safety-related persons from 7 countries, including China and Vietnam, under the sponsorship of the Korea International Cooperation Agency of the Ministry of Foreign Affairs and Trade. The invitees will learn advanced accident prevention technologies at training sessions held by KOSHA.

# 2001 Annual Report





**Appendix**

**1. List for development of safety devices**

**1-1. 1999**

List for development of safety devices-1999

| No | Equipment | Major risk elements | Items developed |
|---|---|---|---|
| 1 | Tower crane | Collapse of tower crane collapse due to strong wind | Wind speed meter or interlock system designed to stop work during inclement including strong wind |
| | | Collapse during extended or disassembled operation | Operation stop alarm system between the mast extending/disassembling hydraulic system and T/C |
| 2 | Jib crane | Cargo drops due to the coming off of the cone pin used to clamp containers | Manual tools according to the type of work |
| | | Cut of wire rope | |
| 3 | Crusher | Fall into the crusher while removing the stone caught inside the crusher | Stone guide tool of "Wedge type" |
| | | Starting machine during cleaning caused by | Interlocking system |

| | | |
|---|---|---|
| | stone overloading into the crusher causes seizure | between crusher and stone feeding system |
| | Stone dump during cleaning of crusher | Prevent alarm system of stone dump |
| 4 Used paper compressor | Paper drops to the compressor chamber when removing the stuck paper | Hydraulic pusher used to the remove the stuck paper |
| | Paper drops to the compressor chamber when sorting paper by the conveyor | Safety rope |
| 5 Mixer | Other worker's miss operation while cleaning or maintaining the mixer | Interlocking system between the cover and drive motor |
| | Caught by rotating blade during work as cover open | Air cylinder locking system used to clamp cover |
| | | Key type switch |
| | | Interlocking safety door between the car entrance and the drive motor |
| 6 Cargo elevator | Safety fence and safety door not installed at the car and platform | Interlocking safety door between the platform door and the drive motor |
| | Interlocking system not installed between the car and platform and the safety door | |
| | Car falls due to the break of the chain or connecting ring | Safety fence around the car and elevator |
| | | Drop-preventive system to prevent the fall of transport vehicle |

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|---|---|---|---|
| 7 | Cement belt conveyor | Seizure when removing cement stuck to the belt or drum | Prevention of cement dust dispersion and belt cleaning system |
| | | Seizure or dust collapses during work at inside hopper | Prevention of cement solidification inside hopper |
| | | | Prevention of caught at drum |
| 8 | Brick/block forming machine | Burns by flying of hot water when cover opened | Interlocking system between the internal temperature and water levels and outer tank cover opening/closing |
| | | Caught by moving part of mortar compressor piston | Safety fence and interlock system around the forming machine |
| | | Caught by cubing machine which moved vertical | Hydraulic(or portable) scraper to prevent access to cubing machine |
| 9 | Rotary washer | Caught between interior and exterior cylinder | Interlocking system between the outside cover and the internal rotation |
| 10 | Overheadcrane(hanging device) | Breakaway of coil and heavy materials from hanging devices | Attach friction agent to the C-type hanging device |
| | | Break of defective wire rope | |
| | | Breakaway of defective lug from hanging | Support used to prevent wire rope demage |

| | | | |
|---|---|---|---|
| | | devices | |
| | | | Hook locking system operated by the self-weight |
| 11 | Injection molding machine | Seized between molds when removing foreign matter | Safety door equipped with triple safety devices-mechanical, electric, and hydraulic safety cover at nozzle |
| | | Flying of melting resin | |
| 12 | Overheadcrane(main body) | Falls while checking check the crane body and traveling rail | Limit switch and one-touch bracket at traveling rail |
| | | Caught between crane body and wall while working on the traveling rail | Beam sensor used to detect worker on traveling rail |
| 13 | Forklift | Collides with the person standing at the rear when moving backward | Rear obstacle sensor |
| | | Operator and forklift overturn in the same direction when forklift overturns | Safety belt used during forward and backward movement |
| 14 | Combine | Cut of finger by the gear of feeding unit | Automatic feeding system |
| 15 | Building management | Slips when cleaning the floor | Non-slip technology |
| | | Falls while cleaning the building exterior wall | Prevention of falling technology |
| 16 | Pig night soil tank | Oxygen shortage during cleaning the inside of the pig night soil tanks | Ventilation system inside the tank |
| 17 | Live work | | Cover on top of tank |

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|---|---|---|---|
| | | Falls and suffocated near the tank | Electric alarm hand-watch detects live wire |
| | | Manually handle hot-line without tools | Voltage detector |
| | | Handles hot-line even thought working can be done on inactive line | Bucket-truck alarm for live work |
| 18 | Fire-prevention research team | Organized following fire occurred at large construction site where 27 persons died | Fire-prevention manuals published by industrial sectors and type of work |
| | | | Special training course(from October 1999) |

**1-2. 2000**

List for development of safety devices-2000

| No | Equipment | Major risk elements | Items developed |
|---|---|---|---|
| 1 | Wire drawing machine | Caught between the wire and while operating wire drawing machine | Drum cover and interlock system |
| | | | Bar-type emergency stopper |
| 2 | Portable grinder | Electric shock resulting from leakage | Safety handle installed for carrying |
| | | Destroy and flying of grinding stone | Insulator attached to inside the tail cover |
| 3 | Extruding machine | Electric shock caused by contact with the heater terminal of the resin melting part | Insulator cap and insulator ring |
| | | Caught by screw while removing foreign matter in resin materials | Cover and interlock(or alarm) system |

| | | |
|---|---|---|
| | | Key type switch |
| 4 Common lathe | Caught by the fast rotating chuck | Manual tools and jigs for grinding work |
| | Cut of finger while removing chip | Grinding jigs and electric belt sander, etc. |
| 5 Screw conveyor | Caught by the rotating screw while removing foreign matter | Each interlock system of trough cover and rope-type interlock system |
| | Caught by the screw during overhaul maintenance | Key type locking bar safety device |
| 6 Coating machine | Caught by the rotating screw while removing foreign matter | Emergency stop and electric brake |
| | Caught by the screw during overhaul maintenance | Coating roll open system |
| | | Roll reserve device for cleaning |
| 7 Roller Machine(Mixing mill) | Caught by roll while softening rubber and/or synthetic resin | Automatic roll reversing device(air brake) |
| | Caught while cleaning of roll surface | Manual roll reversing device(small roller) |
| | | Detachable guard for cleaning |
| 8 Shearing machine | Cutting of finger by the shearing blade | Uneven type protecting fence (guard) |

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|---|---|---|---|
| | | Seized by press bar | Sloped-type protecting fence (guard) |
| 9 | Drilling machine | Fingers with glove caught by the rotating drill | Semi-circle type safety cover |
| | | Electric shock resulting from breakdown | Vise installer |
| | | | Emergency stop of drill |
| 10 | Welding machine | Electric shock during welding | Automatic welding-wire feeding and recovery system |
| | | Risk of fire, explosion and fall during work at high places or a closed area | AC arc welding machine carrier |
| | | | Flame receiver using a magnet |

**1-3. 2001**

List for development of safety devices-2001

| No | Equipment | Major risk elements | Items developed |
|---|---|---|---|
| 1 | Vehicle maintenance work | Subject to collision and caught when disabled car being moved or pulled | Disabled car transporting jig and transporting equipment |
| | | Physical overload and caught when assembling and disassembling engine and transmission | Engine assembling/disassembling jack<br>Plated car moving jig |
| 2 | Hydroextractor | Caught when materials are put in or extracted | Cover safety device<br>Speed sensor |
| | | Struck by flying object, fall, and electrical shock during d±³ing work | Cover opening/closing device (including the cover) |

| | | | |
|---|---|---|---|
| 3 | Die casting machine | Caught due to error during maintenance | Photoelectric safety device |
| | | Caught while mold is being moved or replaced | Melt scattering preventive plate |
| | | | Mold safety block |
| 4 | Press work | Seized due to difficult rapid stop of positive motion press | All stop clutch modified<br>Standard guard (2 types) |
| | | Seized while materials are being supplied or extracted | Sliding mold |
| 5 | A-shaped ladder | Overturns and falls during work at upper side | Fall-preventive outrigger |
| | | Overturns and/or falls while descending after work | Fixing rope designed for shipbuildingindustry |
| 6 | Motorized Carrier | Seized or collides while transporting materials | Approaching materials sensor |
| | | | Wheel guard fence |
| | | Seized while rails are repaired | Carrier separation-preventive stopper |
| 7 | Plastic crusher | Caught while scraps are injected or extracted | Scrap inlet |
| | | | Private hand tools |
| | | Seized while removing materials from the bottom of crusher | Reverse rotation system |
| 8 | Cement silo | Falls due to inadequate cleaning method | Aeration system |
| | | Collapse and struck by falling while removing settlements on the wall of silo | Settlement removing scraper |
| 9 | Flange repairing jig | Dangerous materials leak during maintenance work | Pipe flange handling jig |

| | | | |
|---|---|---|---|
| | | Caught and back pain due to unreasonable motion | |
| 10 | Materials and semi-finished good transporting | Caught or collides with the running carrier or straightly reciprocating or rotating machines while materials or semi-finished goods are being transported | Working process improved<br>Auxiliary carrying tools |
| | | Back pain occurs during unreasonable motion while moving heavy materials | |

# 2001 Annual Report





**Appendix**

**2. List for development of technologies related to the improvement of hazardous working environment**

| List for development of technologies related to the improvement of hazardous working environment | | | | |
|---|---|---|---|---|
| No | Type of work | Hazardous factor | Process to be improved | Major items developed |
| 1 | Epoxy resin laminated products manufacturing | Organic solvents | Epoxy resin laminating process | Automatic materials injection and quantitative discharge device<br>Automatic materials mixing device<br>Automatic conveyor<br>Industrial ventilators |
| 2 | Metal product manufacturing | Organic solvents, noise | Waste drum recycling process | Automation of air blower and brushing machine<br>Industrial ventilators<br>Improved drum loading system |
| 3 | Paper manufacturing | Organic solvents | Branch pipe coating process | Automation of branch pipe carrying system<br>Industrial ventilators<br>Toxic materials replacement |
| 4 | Musical instrument manufacturing | Organic solvents | Piano painting process | Eddy current absorption type water booth |
| 5 | Artificial stone product manufacturing | Dust | Grinding process | Proximity hood and one-touch connecting jack<br>High-pressure control pipe<br>Miniaturized air purifying device |
| 6 | Plastic product manufacturing | Noise, organic solvents | Bath manufacturing process | Automatic bath cutter<br>Industrial ventilators |
| 7 | Nonferrous metal | Noise and | Crushing process | Automation of waste battery cutting |

| | | | | |
|---|---|---|---|---|
| | product manufacturing | simple repeat work | | Automatic waste battery conveyor system |
| 8 | Food manufacturing | Noise | Inspection and filling process | Bottle collision-preventive device |
| 9 | Automotive parts manufacturing | Noise | Brake pad manufacturing process | Low-noise nozzle and soundproof device<br>Automation of pad reversal work<br>Semi-automatic pad aligning |
| 10 | Automotive parts manufacturing | Simple repeat work | Seat covering process | Automation of seat covering work |
| 11 | Automotive parts manufacturing | Simple repeat work | Spring mounting and processing | Automation of spring mounting<br>Industrial ventilators |
| 12 | Metal product manufacturing | Noise | Radial drill process | Installation of magic cutter nozzle on radial drill |
| 13 | Nonferrous metal casting | High temperature and dust | Slag disposing Process | Automatic slag disposing device |
| 14 | Stone product manufacturing | Noise | Stone surface treatment process | Burner work improved into a shot ball injection system<br>Industrial ventilators |

# 2001 Annual Report





**Appendix**

### 3. Occupational safety and health research titles for 2001

#### 3-1. Research on safety and health policy

| Research on safety and health policy | |
|---|---|
| No. | Projects |
| 1 | Evaluation of Effects on the Government-Funded Occupational Health and Safety Program for Small Scale Industries |
| 2 | A Survey on the Safety and Health hazard in Less Than 3 Employee Workplace |
| 3 | A Study on Occupational Health Management System in the Workplace |
| 4 | A Survey on the Compliance Status of the Eleven Fundamental Occupational Safety and Health Guidance |
| 5 | The Development of Survey Research System for Occupational Safety and Health Tendency |
| 6 | The Development of a Survey System and Evaluation Method Model for Ergonomic Job Postures |

#### 3-2. Research on safety engineering into mechanical, electrical, chemical and construction area

| Research on safety engineering into mechanical, electrical, chemical and construction area | | |
|---|---|---|
| No. | Field | Projects |
| 1 | Machine safety | Development of Fume and Dust Exhausting System for the Reparing Process at the Casting Factories |
| 2 | Machine safety | A Study on Risk Assessment of Hazardous Machines and Product Liability |
| 3 | Machine safety | A Study on Safety Manual for Agricultural and Forest Machinery |
| 4 | Machine safety | Development of laser-based safety device for dangerous machines |
| 5 | Electric safety | Technique to Protect Electromagnetic Hazards due to Radio-Frequency Fields |
| 6 | Electric safety | Grouding Method of Surge Protection in the Petrochemical Industry |
| 7 | Chemical engineering safety | Thermal Decomposition Characteristics of Organic Peroxides |
| 8 | Chemical engineering safety | Development of Preventive System for Prediction by Human Error in Team Behavior Assessment at the Maintenance of Chemical Plant |
| 9 | Chemical engineering safety | Development of Hazard Evaluation Techniques in Laboratory |
| 10 | Chemical engineering safety | Development of the Multimedia FTA Construction System Using Process Database |

#### 3-3. Research on construction safety

| Research on construction safety | |
|---|---|
| No. | Projects |

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|---|---|
| 1 | Development of Safety Management Information System in Construction Sites (Focused on the Apartment, Housings and Buildings) |
| 2 | Development of Safety Management Manual for Steel Construction |
| 3 | Research into the Toxicity and Danger Preventive Program, Analysis of Related Problems and Substantiation Program |
| 4 | A Study on the Improvement of the Effectiveness of Safety Assessment Regulations for Construction Works |
| 5 | A Study on Standards of Function Inspection for 6 Meter Pipe Support |

**3-4. Resecrch on industrial hygiene**

| Resecrch on industrial hygiene | |
|---|---|
| No. | Projects |
| 1 | Development of Comprehensive Occupational Health Strategy in Construction Workplaces |
| 2 | Job-Related Hazard Evaluation and Health Management in Commercial Drivers |
| 3 | Model Project of Preventing occupational cerebro-cardiovascular disesase by applying an intergrated health management models at workplaces |
| 4 | Development of Systematic Approach to the Comprehensive Workpalce Health Promotion |
| 5 | A Preliminary Study on Job Stress: Development of Evaluation Tools and Management Programs for Korean Workers |
| 6 | The Results of Quality Control Program for Industrial Hygiene LABs over 10 Years and Improvement Strategy of the Quality Contro Program in Korea |

**3-5. Research on industrial epidemiology**

| Research on industrial epidemiology | |
|---|---|
| No. | Projects |
| 1 | Development of Korean Workers' Lung Function Forecasting System (II) |
| 2 | Research into the Evaluation of Exposure at Workplaces Handling Carcinogenic Materials |
| 3 | Occupational Disease Surveillance Systems Constructed at Busan, Ulsan and South Gyeongsang Province |
| 4 | Research into Construction of an Occupational Lenkemia and Mesothelioma Surveillance System |

**3-6. Research on occupational disease**

| Research on occupational disease | |
|---|---|
| No. | Projects |
| 1 | Epidemiological Study of Foundry Workers(II) |
| 2 | Health Hazard Assessment by Genetic Polymorphism Analysis(II) |
| 3 | Biological Monitoring for the Workers Exposed to Hazardous Materials |
| 4 | Occupational Risks and Musculoskeletal Disorders in Electric and Electronic Manufactures |
| 5 | Identification and Analysis of Organic Solvent Metabolites |
| 6 | Development of a Noise-Induced Hearing Loss Prevention Program |
| 7 | Development of Health Management Manuals for Hospital Workers |
| 8 | Health Protection of Female Workers |
| 9 | Study on Reproductive Toxicity Mechanism Caused by Endocrine Disruptor |
| 10 | Investigation into Electromagnetic Radiation Exposure of Workers |
| 11 | Study on the Necessity for Health Examination Related to Hazardous Materials, Establishment of Inspection Items, and Review of the Materials Requiring Health Management Pocket Books |
| 12 | Study for the Recuperation Standards and Disability Grade of Pneumoconiosis Workers |
| 13 | Occupational Disease Surveillance Systems<br>- Research on Occupational Disease Surveillance Systems in Gumi Area |
| 14 | Disease Surveillance Systems<br>-Occupational Disease Surveillance System in Gyeongin (Seoul and Incheon) Area |
| 15 | Research on Occupational Disease Surveillance Systems<br>-Occupational Musculoskeletal Disorder Surveillance Systems |

**3-7. esearch on occupational toxicology**

| esearch on occupational toxicology | |
|---|---|
| No. | Projects |
| 1 | Development of the Toxicity Test Method for Particles and Fibrous Substances |
| 2 | Research on th Effects of Acid and Alkaline Mist on the Respiratory System of Animal |
| 3 | Research on Hereditary and Oxidized Damage Caused by Metal Compounds |
| 4 | Toxicologic Research on the Endocrine Disruptors |
| 5 | Development of Forecasting Systems for the Chronic Intoxication Caused by Industrial chemicals. |
| 6 | Research on Chemical Hazard Classification and Labelling Systems for the Chemicals |

# 2001 Annual Report





**Appendix**

**4. Training Courses**

| Training Courses | | |
|---|---|---|
| Field | No. of courses | Course |
| Total | 45 courses | Qualifications of the workplace safety and health instructors |
| Safety management | 9 courses | Implementation of accident-free campaign<br>Handling of industrial accidents and establishment of improvement plans<br>Ergonomics<br>Ergonomic improvement at workplaces<br>Prevention of fires and expolsions<br>Transporting safety<br>Qualifying KOSHA 2000 evaluators<br>Refreshing for KOSHA 2000 evaluators |
| Industrial health | 12 courses | Qualifying local exhaust system inspectors<br>Noise/Vibration prevention techiques<br>Ventilation principles and local exhaust system design<br>Simple repeated work and VDT work management<br>Working environment improvement<br>Technique of utilizing safety and health information<br>Accident rescue and emergency action<br>Health promotion (no smoking)<br>Safety related to work in confined space<br>Prevent and management of back pain<br>Occupational medicine-special ¥2 |
| Safety engineering | 14 courses | Occupational nursing-special ¥3<br>ress and shear inspectors<br>Crane inspectors |

| | | |
|---|---|---|
| Construction safety | 10 courses | Chemical facilities inspectors |
| | | Protection of overcurrent (High class) |
| | | Grounding of electric equipment |
| | | Prevention electric fires and explosion-proof safety |
| | | Equipment maintenance and installation management |
| | | Analysis of risks and operation |
| | | Analysis of accident frequency |
| | | Analysis of accident investigation results |
| | | Preparation and evaluation of process safety reports |
| | | Process safety management I |
| | | Construction lift safety |
| | | On-the-iob training for manufacturing supervisors |
| | | Safety related to temporary works |
| | | Qualifying KOSHA 2000 evaluators (construction) |
| | | Examination of hazard prevention plan |
| | | Safety related to sheathing works |
| | | Safety related to blasting |
| | | Bridge construction work design |
| | | Construction manager |
| | | Field training for construction supervisors (Elementary class) |
| | | Field training for construction supervisors (Middle class) |
| | | Field training for construction sufervisors (High class) |