

**PRESENT CONDITIONS OF ENVIRONMENTAL
ADMINISTRATION BY A NON-GOVERNMENTAL
CO-OPERATIVE ORGAN SET UP BY MINOR
ENTERPRISES IN KYOTO**

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ABSTRACT

A general survey of a non-governmental co-operative organization of small enterprises in Kyoto (Kyoto Kojo Hokenkai) and its current activities in environmental administration are reported. The type of environmental measurement, the number of enterprises investigated and cases measured, and the results of systematic consultations and patrolling of the working environment are shown. A newly defined index, unaccomplishment rate (UAR), was introduced and the rate found very suitable for the evaluation of the general conditions of industrial safety and health in an enterprise or a group of enterprises. The decrease in the rate from 38.7% in 1973 to 14.7% in 1976 suggests a remarkable improvement in the enterprises investigated.

The Kyoto Industrial Health Association was established in 1940 as a private co-operative organization concerned with industrial hygienic activities in minor enterprises in Kyoto. The activities, which initially consisted mainly of health examinations and T. B. therapy, were gradually expanded and now cover comprehensive occupational health activities such as preventive and clinical work for occupational and general diseases, environmental work, medical examinations, research and education. Since the Association is based on a membership system, its services are available primarily to the enlisted enterprises and their workers, though they are partly available also to other enterprises, schools, faculties, students and pupils, workers' families and to citizens in general².

Table 1 shows the numbers of member enterprises and employees in 1976 according to type of activity. Small enterprises with less than 300 employees account for 86.6% of the total membership, and their employees for 42.2%. However, a regional organization of enterprises in Kyoto is very difficult because small and very small enterprises form the majority. Thus, the numbers of member enterprises and their workers account for only 0.57% of the total number of enterprises, and for 7.08% of the total working population in Kyoto.

The present activities can generally be divided into preventive work, clinical services, environmental work, medical examinations, research, and education. A

TABLE 1
Number of members enterprises and employees according to type of activity (1976).

Industry	Number of enterprises	Number of employees
Construction	7	1 021
Manufacturing		
Textile	32	1 909
Electric machines	20	6 826
Metallic products	21	1 695
Iron, steel and non-ferrous metals	19	2 665
Machines and tools	17	1 031
Chemicals	18	2 371
Precision machines	10	2 639
Others	50	13 398
Wholesale and retail trade	22	4 899
Finance and insurance	1	322
Transport and communication	25	5 046
Services	12	1 120
Total	254	44 942

general survey of the activities in 1977 showed the following: total number of periodical health examinees, 106 772 (86 911 for non-occupational diseases, 19 861 for occupational diseases); number of enterprises where the environmental conditions were examined, 181 (number of cases examined, 6 507) total attendance to the clinic, 28 296; total number of medical examinations, 711 754 and total budget, 946 million yen.

ACTIVITIES

Environmental hygienic activities in enterprises began in 1964 as a result of an increasing realization of their importance. The number of enterprises investigated increased from 9 (127 cases) in 1964 to 191 (6 500 cases) in 1976. The main activities at present are measurement of working conditions, systematic consultations, patrolling of the working environment, and general guidance and education in environmental administration.

The measurement begins with a preliminary survey of such objects as hazardous chemicals, conditions of the workers and the working areas, etc. On this basis, a detailed design for measurement is worked out, followed by sampling and determination. A report on the result of the investigation is sent to the enterprises within ten days together with recommendations for improvements and the respective literature. If necessary, meetings are held at the enterprise to discuss matters in greater detail.

Table 2 shows the results of environmental work in 1976. Organic solvents and dust were the main substances examined, while other hazardous chemicals such as chromium compounds, acids and cyanides were found to have increased. The total number of cases examined has remained almost unchanged for four

TABLE 2
Results of environmental work (1976).

	Number of enterprises conducted	Number of cases measured
Systematic consultations and patrolling of working environment	85	—
Measurement		
Dust	52	1 217
Organic solvents	86	1 534
Lead	22	227
Other toxic substances	76	805
Noise	31	204
Ionizing radiation	2	56
Air supply and exhaust system	50	253
Temperature and humidity	2	130
Office conditions	17	1 987
Others	19	37
Total	357	6 450

TABLE 3
Number of measurements by means of analytical instruments or methods (1976).

Instrument or method	Number of measurements
Digital dust indicator	1 480
Gravimetric analysis	150
Phase-contrast microscope	15
Detection tube	2 198
Gas chromatograph	549
Spectrophotometer	575
Atomic absorption spectrophotometer	327
Noise level meter	204
Dosimeter	56
Anemometer	280
Thermometer and hygrometer	493
Illuminometer	102
Others	21
Total	5 533

years. It is considered that 90% of the measurements were motivated by the laws enacted in recent years. Table 3 shows the number of measurements performed by means of analytical instruments or methods. The expenses for the investigations are paid by the respective enterprises. In 1976, the average expenses paid by the enterprises amounted to one hundred thousand yen. Income from environmental work totalled 18.5 million yen.

Working areas have been periodically and systematically patrolled by registered industrial hygienic consultants since 1972. During the patrols, 66 points indicated by laws and regulations, are checked, summarized and reported in written form (Table 4). Shiki, one of the authors, summarized the result of patrolling with a new index "unaccomplishment rate" (UAR) defined by the following formula:

$$\text{UAR (Unaccomplishment Rate)} = (U/A) \times 100 (\%),$$

where A = the number of cases which should be accomplished, and U = the number of unaccomplished cases¹.

TABLE 4
Check points for the evaluation of the general conditions of industrial safety and health.

Organization of industrial safety and health service
Committee meetings
Arrangements for hearing worker's opinions
Appointment of chief supervisor, industrial physician, supervisor and manager, for hazardous work
Supervision of subcontract enterprises
Monitoring of hazardousness
General conditions of the ordinary working environment
Working space, ventilation, illumination, etc.
Air supply and exhaust systems
Working standards of the operators of punchers, telephones, etc.
Control of hazardous working environment
Periodical measurement of hazardous elements
Device by sanitary engineering
Use of protective devices
Improvement of sanitary facilities
Ergonomics
Improvement of the working conditions of workers operating office machines, handling heavy objects, etc.
Health examination
Conduction of health examinations for employment
Education
Industrial safety and health
Others
Others
Maintenance of safety devices
Others

For the evaluation of the general conditions of industrial safety and health in an enterprise or a group of enterprises, this newly defined index (UAR) has been found to be very suitable. Table 5 shows the UAR since 1973. A marked improvement in the member enterprises can be observed. The number of unaccomplished cases per enterprise decreased from 8.9 in 1973 to 4.0 cases in 1976. However, in enterprises where work is hazardous, after the enforcement of

TABLE 5
Standard of industrial safety and health (Unaccomplishment Rate*).

	UAR (%) / Number of A*			
	1973	1974	1975	1976
1. Organization of industrial safety and health service	19.4/330	11.0/346	9.2/314	2.2/315
2. General conditions of ordinary working environment	42.1/290	25.0/148	18.2/143	11.1/143
3. Control of hazardous working environment	45.5/1168	24.7/1124	19.2/1184	14.8/1120
4. Ergonomics	23.7/295	20.0/155	22.6/75	7.9/63
5. Health examination	45.1/634	23.2/487	19.8/515	17.9/476
6. Education	14.6/130	35.4/113	33.6/110	50.6/85
7. Others	54.6/130	36.3/113	20.0/110	17.6/85
8. Total (general standard)	38.7/2977	23.3/2486	18.8/2451	14.7/2287
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Total number of unaccomplished cases				
Number of enterprises patrolled	1152/130	578/113	460/110	337/85

*Unaccomplishment Rate (UAR) is an index defined by the following formula: $UAR = (U/A) \times 100 (\%)$; A = number of cases which should be accomplished; U = number of unaccomplished cases.

environmental measurement the UAR showed a slight decrease from 41.1% to 37.9% for the four years, whereas the rates regarding the improvement of sanitary engineering, the use of protective devices and improvements of sanitary facilities showed a remarkable decrease. It appears that the smaller the enterprise, the worse is the rate.

CONCLUSION

The recent increase of diseases caused by environmental hazards in Japan seems to have awakened the enterprises and their proprietors to the importance of environmental administration. However, it is not easy for enterprises, especially for small ones, to introduce satisfactory activities because of their own financial problems and inadequate knowledge of sanitary engineering, etc. Similar difficulties have been observed in the activities of non-governmental, extra-enterprise organizations.

In view of the importance of environmental activities in comprehensive industrial health services, voluntary activities should be expanded in all enterprises, while small enterprises and private organizations should be given technical and financial support by the government.

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REFERENCES

1. *Shiki, T., Tanaka, H., Takagi, H. and Yuasa, T.* Studies on health administration of minor enterprises, (2) present status of industrial health standard in Kyoto. *Jpn. J. Ind. Health*, **16** (1974) 395.
2. *Tokunaga, R. and Inui, S.* The status of occupational health activities in the private co-operative organization of small enterprises in Kyoto. *Proceedings of 8th Asian Conference on Occupational Health*, (1976 in Tokyo) p. 72-75.