UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

CENTER FOR LABOR RESEARCH
AND EDUCATION
INSTITUTE OF INDUSTRIAL RELATIONS (Berkeley)

BERKELEY, CALIFORNIA 94720

OCCUPATIONAL HEALTH IN THE SOVIET UNION

by

Andrea M. Hricko
Health Coordinator
Labor Occupational Health Program

To be presented at the American Public Health Association Convention, Session on Occupational Health in Socialist Countries, November 19, 1975

This paper is primarily based on the author's experiences as member of a tour group of U.S. occupational health specialists and workers which visited the Soviet Union in September 1975. It reflects information obtained from interviews with officials in the U.S.S.R., from first-hand observations of tour members, and from published information.

The two most striking features of the Soviet occupational health system were the emphasis on preventive medicine and the intimate involvement of trade unions in worker health and safety issues. I shall discuss each of these aspects in greater detail and at the end of my presentation show a series of slides to highlight some of the major points.

Preventive medicine

The Soviet government authorities emphasize that health care is an objective of their system and is a basic right of all people. Materials that government and trade union officials distributed to us stressed that the emphasis on good health is consistent with the ideas of productivity and economic development which are key points of the Soviet 5-year plans. This emphasis on health care is illustrated by the fact that the U.S.S.R., with only 18% more people than the United States, has twice the number of physicians, six times the number of female physicians, and three times the number of hospital beds.[1] Moreover, a large number of these physicians are involved in preventive and environmental medicine, as opposed to simply treatment of the ill.

Occupational health services in the Soviet Union are administered by the government, by industrial establishments, and by the trade unions. The system appeared to be well-integrated. All large enterprises have polyclinics (outpatient departments); some have hospitals. Smaller establishments have medical posts.

We visited a hospital in Leningrad which served workers from six plants involved in the manufacture of optical equipment. The hospital had 350 beds and a staff of 100 physicians, but the physician in charge said that the hospital's main function is to prevent disease among the 20,000 workers that it serves. This is accomplished, in part, by annual medical examinations for all workers from the optical plants, with stricter medical surveillance required for workers with certain medical problems or who are exposed to certain hazardous substances.

The woman physician in charge of the hospital said that physicians personally inspect the working stations to insure that they are free from hazards. In addition, every month the air in all six optical plants is sampled; if any standard is violated, the Saniped station is called in to control the hazard.

These Saniped (or sanitary-epidemiological) stations appear to be the backbone of the Soviet environmental health system. Although we were unable to visit one, we were told that 5,500 such stations operate in the U.S.S.R. They are concerned with correcting any preventable medical problems in their districts -- such as controlling infectious disease

epidemics, monitoring for occupational safety and health problems, inspecting food and water, and controlling environmental pollution.[2]

The Sanipeds are also involved in community planning. They certify new or rebuilt enterprises (in cooperation with trade union inspectors). Every day samples are tested in Saniped laboratories. If violations are not corrected, the Saniped can cite establishments and actually close down plants.

The occupational health standards that the Sanipeds enforce are based on research that is conducted at a variety of government research and industrial hygiene institutes. The primary research institution is the Academy of Medical Sciences'Institute of Industrial Hygiene and Occupational Diseases, located in Moscow. This institute has 275 scientists who do practical research which results in recommendations for occupational health standards. With the consent of the All-Union Council of Trade Unions, these standards are eventually set as MACs or Maximum Acceptable Concentrations.

As is well-known, the Soviet standards are generally stricter than those employed in the United States. This is primarily because Soviet toxicologists take into account behavioral, neurotoxic, and mutagenic effects[3], which are often ignored in the setting of U.S. standards.

In addition, environmental and occupational health standards in the U.S.S.R. are generally set based on health effects alone, without

regard to considerations of available technology or economic feasibility.[4] This contrasts sharply with the standards-setting policies currently in effect in the United States.

The U.S.S.R. MAC values (maximum concentrations as opposed to time-weighted averages) are compared to those in the U.S. and other countries on the attached list. Since our group toured only a few factories, we were not able to ascertain from first-hand observations the quality and availability of monitoring devices to enforce these standards.

Management at the carpet factory which we toured outside of Moscow stated that noise was the primary occupational health problem at the facility. The woman in charge of the plant stated that various control techniques (such as wall and ceiling absorbing tiles) had been used to lower the level of most operations in the plant to below 85 dBA and to below 95 in [redacted] weaving operations. A chart which I shall show in the slides illustrates the noise reduction achieved through control technology. Sound level readings taken by one of our tour members verified that the noise levels were in the low 80's, except for weaving.

At this carpet factory, as well as at other establishments throughout the country, there are special employment policies for pregnant women. When factory women become pregnant in the Soviet Union, the policy is to immediately transfer them to safer parts of the plant where they will not be exposed to toxic substances. The women continue to receive their same salary after the transfer. Moreover, a woman can remain

at home for one year without pay after she has a baby and can then return to her job without loss of seniority or pension rights. In contrast, very few companies offer equal pay-transfers during pregnancy in this country. Most women in the U.S. have to risk job security to insure the health of their unborn children.

The Soviet Union also forbids the employment of women in certain jobs and with certain chemicals. For example, women cannot work with lead, benzene, or around coke ovens. At the optical plants mentioned earlier, women are not allowed to work with chrome, nickel, tar, or in metal casting operations.

In addition to the concern for pregnant women workers, the U.S.S.R. appears to pay more attention to reproductive problems that may also affect male sexual functions. The Chief of the Industrial Toxicology Laboratory at the Institute for Industrial Hygiene and Occupational Diseases reported that several chemicals tested in her laboratory -- chloroprene, ethylene oxide, and dimethyl dioxide -- have been found to affect male gonads.

The role of trade unions

Trade unions play an important role in administering and double-checking on all occupational health services and on the implementation of labor legislation. The unions employ 5,500 paid inspectors who guarantee that labor legislation is implemented and that requirements concerning work conditions in labor-management agreements are carried out. These 5,500 inspectors are an inspection force separate from the 20,000 government health and safety inspectors.

The trade union technical inspectors have the power to ask for improvement of hazardous working conditions. If the hazards are not corrected, they can have the job shut down. Management can be fined or fired as a result of continued violations.

These same inspectors check new or remodeled jobsites to insure that they are in accordance with standards before these operations are approved by the district Sanipeds.

In individual enterprises there are labor protection committees composed of 7 to 17 members, depending on the size of the concern. This local committee elects an inspector to check machine guards, ventilation, violations of work hour regulations, etc. The inspectors are similar to our shop stewards.

In addition to the government-sponsored health and safety research institutes, there are six labor protection institutes that are administered by the All-Union Central Council of Trade Unions in Moscow. These labor institutes are located throughout the country and each focuses on a different industry or health problem. The one which we visited in Leningrad had 10 laboratories and a staff of 300. Some of the laboratories were concerned with acoustics, air conditioning, industrial psychology, and lighting. The respiratory systems laboratory tested new protective devices. In the noise lab, methods have been developed to reduce the noise levels of pneumatic drills.

The AUCCTU, which guides the trade unions in labor protection, submits proposals to the government for new health and safety regulations based on information gained from these institute investigations.

Each of the 25 Soviet trade unions has its own Labor Protection Department. One function of the department is to train workers in health and safety. For example, the Labor Protection Department of the Education and Scientific Workers Union trains all new workers in health and safety before they begin a new job. In addition, the department annually trains 189,000 technical inspectors to inspect worksites where the union's 7.8 million members are employed.

Trade unions also play a role in workmen's compensation disputes. Disabled workers receive a pension from the state social insurance fund. If the trade union technical inspector decides that an accident was the fault of management, then the workers have the right to claim compensation for the injury. Compensation is paid if management agrees with the technical inspector; if agreement cannot be reached by the trade union committee and management, the case goes to court for resolution.

Techniques on construction sites

Several members of our group conducted their own casual inspections of construction sites. Robert Fowler, who is now Labor Coordinator of our program at Berkeley and who is a carpenter by trade, observed that few safety precautions to prevent injuries were taken on jobsites. For example,

on sites that he visited he saw very few workers wearing hardhats, safety glasses or other protective devices. Welders did wear helmets and face shields.

As will be demonstrated by slides at the end of my talk, modern equipment and techniques were generally not utilized. On one hi-rise site, workers were using sawed off timbers both as measuring devices and supports for cement modules that were being lowered into place on the building.

Despite the fact that the tools used were outdated and the techniques antiquated, Fowler speculates that several other factors may be instrumental in keeping accident and injury rates low. First of all, he observed that workers generally controlled the speed with which they worked. Second, since there is no unemployment problem in the Soviet Union, workers do not have to work fast for fear of losing their jobs. In addition, very few people were working at one time at any jobsite, thereby eliminating the increased potential for accidents which occurs when several construction operations are being performed at one time.

This same lack of speedup seen on construction sites was also evident at a small cognac factory that some tour members visited in Yerevan, the capital of the Armenian Republic. At that factory several operations (such as labeling bottles) were done by hand. Similar bottling operations in the United States would undoubtedly be automated.

Fowler also said that the construction methods he observed were generally inefficient, but made it possible for unskilled workers to perform. The results of using these techniques, however, were evident in some of the buildings we saw. For example, the stairs of a five-year old hotel in Baku were crumbling and were temporarily supported with wooden wedges as a makeshift repair.

Conclusion

The Soviet occupational health system appears to be fully integrated into the health care system of the country. The roles of government, industry, and trade unions are all intimately connected, with unions having more significant input into decision-making on health and safety than in the United States. Certain aspects of toxicological research, such as the study of behavioral and reproductive effects of toxic substances, appear to be advanced. Although the numerical environmental standards set by the Soviet Union are much stricter than those of the United States, it was not possible for us to verify first-hand that these standards for chemicals are adequately enforced.

Finally, observations of worksites led our group to believe that a much greater emphasis is placed on occupational health in the Soviet Union than on job safety. The opposite has always been true in the United States and the U.S. emphasis has just begun to change in the past few years. What became most clear during our brief two week tour was that a great deal of emphasis is placed on the health and welfare of the worker in Soviet society.

WORK ENVIRONMENT HYGIENIC STANDARDS IN DIFFERENT COUNTRIES

	USA—OSHA 1971		BRD 1974	DDR 1973	Sweden 1975	CSSR 1969	USSR 1972
	ppm	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³ (c)
Acetaldehyde	200	360	360	100	90	--	5
Acetic acid	10	25	25	20	25	—	5
Acetone	1000	2400	2400	1000	1200	800	200
Acetonitrile	40	70	70	—	—	—	10
Acrolein	0.1	0.25	0.25	0.25	0.25	0.5	0.7
Aldrin	—	0.25	0.25	—	—	—	0.01
Allyl alcohol	2	5	5	5	5	3	2
Ammonia	50	35	35	25	18	40	20
Ammonium sulfamate	—	15	15	—	—	—	10
Amyl acetate	100	525	525	200	525	200	100
Aniline	5	19	19	10	19	5	0.1
p-Anisidine	0.1	0.5	0.5	—	—	—	1
Antimony & compounds (as Sb)	—	0.5	0.5	0.5	0.5	—	0.3—2
Arsenic & compounds (as As)	—	0.5	0	0.3	0.05	0.3	0.3
Arsine	0.05	0.2	0.2	0.2	0.05	0.2	0.3
Benzene	10	30	0	50	30	50	5
Benzoyl peroxide	—	5	5	—	—	—	5
Benzyl chloride	1	5	5	5	—	—	0.5
Beryllium	—	0.002	0	0.002	0.002	—	0.001
Boron oxide	—	15	15	--	—	—	10
Boron trifluoride	1 (c)	3 (c)	3	—	—	—	1
Bromoform	0.5	5	—	—	—	—	5
1,3-Butadiene	1000	2200	2200	500	—	500	100
2-Butanone	200	590	590	300	440	—	200
Butyl acetate	150	710	950	400	710	400	200
Butyl alcohol	100	300	300	200	150	100	10
Butylamine	5	15	15	—	—	—	10
Cadmium (metal dust and soluble salts)	—	0.2	—	0.1 (a)	0.05	—	0.1
Cadmium oxide fume (as Cd)	—	0.1	0.1	0.1 (a)	0.02	0.1	0.1
Camphor	2	12	2	—	—	—	3
Carbaryl (Sevin)	—	5	5	—	—	—	1
Carbon disulfide	20	60	60	50	30	30	10
Carbon monoxide	50	55	55	55	40	30	20
Carbon tetrachloride	10	65	65	50	65	50	20
Chlorine	1	3	1.5	1	3 (c)	3	1
Chlorine dioxide	0.1	0.3	0.3	—	0.3	—	0.1
Chlorobenzene	75	350	230	50	—	200	50
Chlorodiphenyl (42% chlorine)	—	1	1	1	0.5	1	1
Chlorodiphenyl (54% chlorine)	—	0.5	0.5	1	0.5	0.5	1
Chloroprene	25	90	90	10	90	50	2
Chromic acid and chromates (as Cr)	—	0.1 (c)	0.1	0.1	0.05	0.05	0.01
Cobalt, metal fume & dust	—	0.1	0.5	0.1	0.1	0.1	0.5
Copper, fume	—	0.1	0.1	0.2 (b)	—	—	1
Copper, dusts and mists	—	1	1	—	—	—	1
Crotonaldehyde	2	6	6	—	—	—	0.5
Cumene	50	245	245	50	—	—	50
Cyclohexane	300	1050	1050	--	**	—	80
Cyclohexanone	50	200	200	—	—	—	10
Cyclopentadiene	75	200	200	—	—	—	5
2,4-D	—	10	10	—	—	—	1
DDT	—	1	1	1	—	—	0.1
Dibutylphtalate	—	5	—	—	—	—	0.5
o-Dichlorobenzene	50 (c)	300 (c)	300	150	—	—	20
p-Dichlorobenzene	75	450	450	200	—	—	20
Dichlorvos (DDVP)	0.1	1	1	—	—	—	0.2
Dieldrin	—	0.25	0.25	—	—	—	0.01
Diethylamine	25	75	75	50	—	—	30
Diethylamino ethanol	10	50	50	—	—	—	5
Diisopropylamine	5	20	—	10	—	—	5
Dimethylamine	10	18	18	—	—	—	1
Dimethylaniline (N-dimethylaniline)	5	25	25	—	—	—	0.2
Dimethylformamide	10	30	60	30	30	30	10
Dinitrobenzene	0.15	1	1	1	—	1	1
Dinitro-o-cresol	—	0.2	0.2	0.2	—	—	0.05
Dinitrotoluene	—	1.5	1.5	1	—	—	1
Dioxane	100	360	360	200	90	—	10
Epichlorhydrin	5	19	18	5	—	—	1
Ethyl acetate	400	1400	1400	500	1100	400	200
Ethyl alcohol	1000	1900	1900	1000	1900	1000	1000
Ethyl amine	10	18	18	20	—	—	1
Ethyl bromide	200	890	890	500	—	—	5
Ethyl chloride	1000	2600	2600	2000	--	—	50
Ethyl ether	400	1200	1200	500	1200	300	300
Ethyl mercaptan	10 (c)	25 (c)	1	—	—	—	1
Ethylene chlorohydrin	5	16	16	—	—	—	0.5
Ethylene diamine	10	25	25	—	—	—	2
Ethylene imine	0.5	1	1	1	0	--	0.02
Ethylene oxide	50	90	90	20	36	--	1
Fluoride (as F)	—	2.5	2.5	—	2.5	1	1
Formaldehyde	2	3	1.2	2	3 (c)	2	0.5
Furfural	5	20	20	10	—	—	10
Heptachlor	—	0.5	0.5	--	--	—	0.01
Hydrazine	1	1.3	0.13	--	0.13	0.1	0.1
Hydrogen chloride	5 (c)	7 (c)	7	5	7 (c)	8	5

(a) as CdO (b) as CuO (c) ceiling value

From: Winell, Margareta. "An International Comparison of Hygienic Standards for Chemicals in the Work Environment." Ambio (Sweden), November, 1975.

	USA—OSHA 1974		BRD 1974	DDR 1973	Sweden 1975	CSSR 1969	USSR 1972
	ppm	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³ (c)
Hydrogen cyanide	10	11	11	5	11	3	0.3
Hydrogen fluoride	3	2	2	1	2 (c)	1	0.5
Hydrogen sulfide	20 (c)	30 (c)	15	15	15	10	10
Iodine	0.1 (c)	1 (c)	1	—	1 (c)	—	1
Isopropylamine	5	12	12	—	—	—	1
Lead, inorganic fumes and dusts	—	0.2	0.2	0.15	0.1	0.05	0.01
Lindane	—	0.5	0.5	0.2	—	—	0.05
Maleic anhydride	0.25	1	0.8	—	1	1	1
Manganese and compounds (as Mn)	—	5 (c)	5	5	2.5	2	0.3
Mercury, metal	—	0.1 (c)	0.1	0.1	0.05	0.05	0.01
Mercury, alkyl	—	0.01	0.01	0.01	0.01 (c)	—	0.005
Methyl acetate	200	610	610	200	—	200	100
Methyl acrylate	10	35	35	20	—	—	20
Methyl alcohol	200	260	260	100	260	100	5
Methyl amine	10	12	12	—	—	—	1
Methyl bromide	20 (c)	80 (c)	80	80	—	—	1
Methyl chloride	100	210	105	100	—	100	5
Methyl chloroform	350	1900	1080	500	540	500	20
Methyl cyclohexane	500	2000	2000	—	—	—	50
Methyl isocyanate	0.02	0.05	0.05	—	—	—	0.05
α-Methyl styrene	100 (c)	480 (c)	480	—	—	—	5
Methylene chloride	500	1740	1750	500	350	500	50
Molybdenum, soluble compounds	—	5	5	—	—	—	4
Molybdenum, insoluble compounds	—	15	15	10	—	—	6
Morpholine	20	70	70	—	—	—	0.5
Naphta (coal tar)	100	400	—	—	—	200	100
Naphtalene	10	50	50	20	—	—	20
Nickel carbonyl	0.001	0.007	0.7	—	0.007	—	0.0005
Nickel, metal	—	1	0	0.5	0.01	—	0.5
p-Nitroaniline	1	6	6	—	—	—	0.1
Nitrobenzene	1	5	5	5	5	5	3
p-Nitrochlorobenzene	—	1	1	1	—	1	1
Nitroethane	100	310	310	—	—	—	30
Nitrogen dioxide	5	9	9	10	9 (c)	10	5
Nitromethane	100	250	250	—	—	—	30
1-Nitropropane	25	90	90	50	—	—	30
2-Nitropropane	25	90	90	50	—	—	30
Ozone	0.1	0.2	0.2	0.2	0.2	0.1	0.1
Pentachlorophenol	—	0.5	0.5	0.5	0.5	—	0.1
2-Pentanone	200	700	700	—	—	—	200
Perchloroethylene	100	670	670	300	200	250	10
Phenol	5	19	19	20	19	20	5
Phosgene	0.1	0.4	0.4	0.5	0.2 (c)	0.4	0.5
Phosphine	0.3	0.4	0.15	0.1	0.4	0.1	0.1
Phosphorus (yellow)	—	0.1	0.1	—	—	0.03	0.03
Phtalic anhydride	2	12	5	10	12	5	1
Propargyl alcohol	1	2	2	—	—	—	5
n-Propyl acetate	200	840	840	400	—	400	200
Propyl alcohol	200	500	—	—	—	500	10
Propylene dichloride (1,2-Dichloropropane)	75	350	350	50	—	—	10
Propylene oxide	100	240	240	—	—	—	1
Pyridine	5	15	15	10	15	5	5
Quinone	0.1	0.4	0.4	—	—	—	0.05
Selenium compounds	—	0.2	0.1	0.1	0.1	—	0.1
Sodium hydroxide	—	2	2	2	2 (c)	—	0.5
Stoddard solvent	500	2950	—	—	600	—	300
Styrene	100	420	420	200	210	200	5
Sulfur dioxide	5	13	13	10	5	10	10
Sulfuric acid	—	1	1	1	1	1	1
Tellurium	—	0.1	0.1	—	—	—	0.01
1, 1,2, 2-Tetrachloroethane	5	35	7	10	—	—	5
Tetraethyl lead (as Pb)	—	0.075	0.075	0.05	0.075	—	0.005
Tetrahydrofuran	200	590	590	200	—	—	100
Tetranitromethane	1	8	8	—	—	—	0.3
Thallium	—	0.1	0.1	—	—	—	0.01
Thiram (tetramethylthiuramdisulfide)	—	5	5	1	—	—	0.5
Toluene	200	750	750	200	375	200	50
Toluene-2,4-diisocyanate	0.02 (c)	0.14 (c)	0.14	0.1	0.07 (c)	0.07	0.5
o-Toluidine	5	22	22	10	—	5	3
Trichloroethylene	100	535	250	250	160	250	10
1, 2, 3-Trichloropropane	50	300	300	—	—	—	2
Triethylamine	25	100	100	20	—	—	10
Trinitrotoluene	0.2	1.5	1.5	1.5	—	1	1
Triorthocresylphosphate	—	0.1	—	0.1	—	—	0.1
Turpentine	100	560	560	300	550	—	300
Uranium, soluble compounds (as U)	—	0.05	0.05	—	—	—	0.015
Uranium, insoluble compounds (as U)	—	0.25	0.25	—	—	—	0.075
Vanadium, V_2O_5 dust (as V)	—	0.5 (c)	0.5	0.5	0.5	—	0.5
Vanadium, V_2O_5 fume (as V)	—	0.1 (c)	0.1	0.1	0.05 (c)	—	0.1
Vinyl chloride	1	3	—	500	3	—	30
Vinyl toluene	100	490	490	—	—	—	50
Xylene	100	435	870	200	435	200	50
Xylidine	5	25	25	10	—	5	3
Zinc oxide fume	—	5	5	5	5	5	6
Zirconium compounds (as Zr)	—	5	5	—	—	—	4—6

(a) as CdO (b) as CuO (c) ceiling value

REFERENCES

1. Daniels, Robert, M.D. "Health services in the U.S.S.R.: a historic and social perspective." Department of Psychiatry, University of Cincinnati, manuscript.

2. Glass, Roger. "A perspective on environmental health in the USSR." Archives of Environmental Health, August, 1975, pp. 391-395.

3. Winell, Margareta. "An international comparison of hygienic standards for chemicals in the work environment." Ambio (Sweden), November 1975.

4. Roschin, Alexander and L.A. Timofeevskaya. "Chemical substances in the work environment: some comparative aspects of USSR and US hygienic standards." Ambio (Sweden), November 1975.