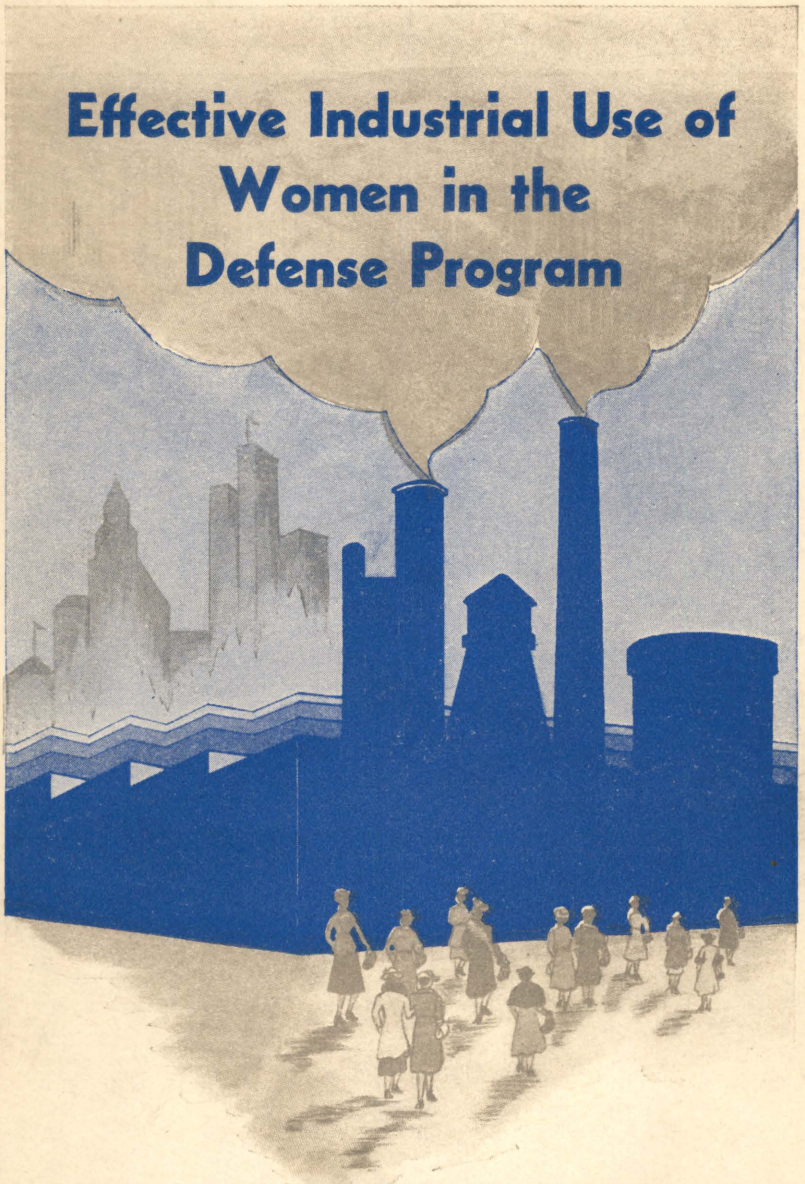
Effective Industrial Use of Women in the Defense Program



THE WOMEN'S BUREAU
U. S. DEPARTMENT OF LABOR

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UNITED STATES DEPARTMENT OF LABOR
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Effective Industrial Use of Women in the Defense Program

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Amalgamated Clothing Workers of America
International Association of Machinists
International Brotherhood of Electrical Workers of America
National Women's Trade Union League
Steel Workers Organizing Committee
Textile Workers Union of America
United Automobile Workers of America
United Rubber Workers of America

EFFECTIVE INDUSTRIAL USE OF WOMEN IN THE DEFENSE PROGRAM

I. Physical characteristics of the job must be suited to woman's physique.
II. Safety assures continuous production.
    1. Machinery should be carefully guarded.
    2. Speed is a powerful factor in causing fatigue and accidents.
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IX. Minimum-wage standards and prevailing-wage standards should be maintained.
X. Training and employment policies should be adjusted to women's needs.
XI. Industrial home work should be prohibited on Government contracts.

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Experience gained by the Women's Bureau in studying the successful employment of women during the first World War and in the 20 years thereafter is a guide for the participation of women in the defense industries to be expanded in the months ahead.

Though women have proved themselves able to do almost any type of work, careful consideration should be given, in planning a defense program, to their employment on processes where they have been found to be most efficient. Altogether, women workers have an important part to play in such a program.[1]

[1] Experience in regard to women workers in the World War is discussed in great detail in the following publication: The New Position of Women in Industry, Bul. 12, Women's Bureau, U. S. Department of Labor, 1924. This report contains the following statement:

First. The popular belief that women in industry rendered real service to the Nation during the war is sustained by the figures showing the numbers of women employed both in war agent and implement industries and in war food and fabric industries, by the preponderance of evidence from employers holding important Government contracts, and by the official statement of the Assistant Secretary of War, acting as Director of Munitions.

Second. The labor shortage and excessive demands on industries essential to the production of implements and agents of warfare resulted during the war in—(*a*) A sharp increase in the number of women workers in these industries during the war. (*b*) A marked decrease in the number of women in the traditional woman-employing industries, resulting in a relief of the long-standing congestion of woman labor in these pursuits and in part contributing to a marked increase in the wage scales of the women remaining in these industries. (*c*) The employment of woman labor in other skilled crafts from which women had been practically debarred before the war.

Particular attention also must be given to the necessary health safeguards where women are employed, since they often are in jobs new to them, operating unfamiliar machinery, and affected more seriously than men by certain of the poisonous substances in common use in industry. Extended experience, both in commercial plants and in the World War industries in 1914–18, shows positively that the fullest productivity depends on adequate safeguards to health. In no country during the World War did the early patriotic enthusiasm, which led to long hours and strenuous work under adverse working conditions, turn out precision implements in quantities necessary for warfare. Nor could such enthusiasm maintain quantity production when harmful working conditions gradually undermined workers' health.

The defense program, calling for speed, quality, and quantity of production, can be attained and maintained over an extended period only when working conditions leading to fatigue, discomfort, ill health, or accident are eliminated.

The following factors have been found of utmost importance in a program aimed to secure successful production in part through the employment of women workers. They represent general standards, but for some of the particular industries in a defense program further provisions also are essential, and continual investigation and consultation is necessary.

I. Physical Characteristics of the Job Must Be Suited to Woman's Physique

There are certain types of work that women do particularly well. Examples are as follows:[2]

1. Women excel in work requiring care and constant alertness, good eyesight, and use of light instruments, such as gages, micrometers, vernier calipers—work calling for little physical exertion.

   These are characteristics of such jobs as inspection of castings, machinings, and finished parts, of routine powder analysis, of testing electrical equipment.

[2] Ibid., pp. 93 and 142.

2. Women excel at work requiring manipulative dexterity and speed, but which permits the individual to set her own tempo and to work in a sitting position.

   These are characteristics of bench work calling for laying out work for machine operators, operating very small machines to finish small and irregular parts, assembling delicate instruments and machines, loading shells, filling powder bags.

3. Women excel in work requiring skill but little strength, either in handling parts or setting up machines.

   These are characteristics of drilling machines, lathes, milling machines, grinding and polishing machines operating on small parts.

4. Women operate large machines successfully on heavy work when such work, whether done by men or by women, requires the use of lifting devices and pneumatic chucks.

II. Safety Assures Continuous Production

Various estimates of the annual cost of industrial injuries run into millions, and these do not include the so-called incidental costs, which are found by analysis to be four times as great as compensation and medical payments. All possible methods of protection should be used to prevent injury from unguarded machinery, excessive speed, muscular strain, explosive chemicals, fumes, acids, dusts, or other harmful substances or conditions. This is especially necessary when women are employed on processes new to them. They will come in contact with complicated machinery and will need to handle dangerous materials and irregular and sharp objects.

1. Machinery should be carefully guarded.

Power machines cause two-thirds of women's permanent partial injuries, such as loss of fingers or permanent injury to other members of the body. The punch press is responsible for half the machine accidents.[3] Typical accidents to women resulting from poorly guarded machinery indicate the problem.[4]

[3] New York Department of Labor, Bul. 127, Some Social and Economic Effects of Work Accidents to Women, November 1924, p. 9.

[4] Women's Bureau Bul. 60, Industrial Accidents to Women in New Jersey, Ohio, and Wisconsin.

A finger amputated when caught in the press because of an improperly set guard.

A crushed and lacerated right thumb and forefinger, due to catching the hand between the cross head of the punch and the top of an iron bar that was fixed on the machine in front of the die.

Loss of a finger tip because the socket on a reamer slipped and reversed the handle while the worker was trying to fix the machine. This occurred in an automobile-parts factory.

Injury to the right hand when a knitting machine started without the operator's putting her foot on the treadle, because the belt connecting her machine with the shafting was out of order.

In matters of testing machine guards and devising more adequate guards, the State departments of labor, divisions of industrial hygiene, and the United States Department of Labor may be consulted. Standard materials and dimensions for belts and belt guards have been approved by the American Standards Association.[5] Further data as to guards can be obtained by reference to Safe Practices pamphlets of the National Safety Council.

In some cases the guard may be applied to the worker rather than the machine. From the number of goggle lenses shattered and replaced for workers in 166 steel mills over a recent 2-year period, a well-known optical laboratory estimated that 2,397 eyes were saved, an estimated saving of $4,000,000 besides preventing untold misery. Painful eye injuries caused by shattered needles and flying fragments of buttons or snaps to workers on button machines are avoided by the use of a lightweight, transparent, plastic mask.[6]

2. Speed is a powerful factor in causing fatigue and accidents.

The speed involved in modern industry is one of the factors demanding that every part be in perfect working order to prevent accidents.[7] Rapid processes are required, for example, when a shoe worker revolving the shoes so as to trim off surplus leather from the upper completes 5,200 shoes a day.

[5] See Summary in the National Safety News, March 1939.

[6] Factory Management and Maintenance, November 1939, p. 288.

[7] See Women's Bureau Bul. 14, A Physiological Basis for the Shorter Working Day for Women.

3. Muscular strain should be avoided if women workers are to produce at their maximum.

Consideration should be given to the weight lifting involved in the job, with provision of special devices for continuous lifting or for heavy loads. Physical work depends on the total load carried per day, average load carried at a time, and duration of its carrying. Much helpful information about lifting equipment is given in the Safe Practices Pamphlets of the National Safety Council. Conveyor systems are the answer for continuous flow of material in process in one direction. The lift truck, hand or power operated, is one of the greatest energy savers, and eliminates motions hazardous to hands, feet, and back. The stacker or tiering machine eliminates much heavy work and many injuries due to handling material.[8]

Six States prohibit employment of women at tasks involving lifting or carrying heavy weights.[9] Specific limits vary from 15 pounds to 75 pounds. The limit should be lower for girls under 18 years.[10]

4. Minors must not be employed on hazardous processes.

The Federal Fair Labor Standards Act provides that no girls under 18 may be employed on types of machines or in occupations determined to be hazardous by the Children's Bureau. The Public Contracts Act provides that no girls under 18 may be employed on production under Government contracts.

III. Women Require Special Protection Where Industrial Poisons Are Used

Women are likely to be more seriously affected than men by some poisons, and certain of these are used to a considerable extent in connection with various processes well adapted to women's abilities. The need for constant study of materials and substances, especially where newly used, cannot be too strongly stressed.

[8] Help for Heavy Loads, in National Safety News, March 1937, pp. 166, 167, 170, 172.
[9] California, Massachusetts, Ohio, Pennsylvania, Utah, Washington.
[10] Overton, S. G. Report No. 44, Industrial Fatigue Research Board, 1927, p. 115.

Examples of substances that have a particular effect on women include:

Benzene, which may dispose to hemorrhage.[11] This is used in explosive plants, in airplane factories in doping the wings, in rubber factories, and in shoe and some metal plants.

TNT, dinitrobenzene, sulphuric ether, and various widely used producers of skin irritations (dermatitis). Women were employed extensively in explosive manufacture and in loading explosives.

Carbon disulphide, which is used in rubber and artificial silk manufacture. The dangers of this powerful poison seem to be more recently understood; it attacks the nervous system, producing a result similar to insanity. This serious hazard can be controlled by good workroom ventilation, together with adequate local exhaust.

Lead, used in rubber and storage-battery plants and in spray painting, as, for example, in automobile plants. It is perhaps one of the most common poisons in use in modern industry. While in some industries the hazard has been practically eliminated, other industries, plants, or processes develop its use.

Mercury, which is used in chemical plants, in photographic supplies, by browners on guns.

Arsenic, which is used in chemical plants, by electroplaters, and by workers on enamel and on rubber.

Silica dust, which is produced by grinding and polishing machines on which women work, and unless it is entirely removed from the air produces an incurable lung disease.

Exhaust systems are absolutely necessary to prevent the air from carrying to the worker the fumes from the poisons just listed, and from many other acids or chemicals such as mercury, wood alcohol, ammonia, and so forth; from gases such as carbon monoxide; and from dusts such as that caused by silica. Individual respirators often are needed where the process brings the worker near to such fumes and gases. All equipment should be inspected frequently to make sure that it is not worn or leaking so that it no longer protects. Furthermore, individual respirators often are not sufficient to take the place of adequate exhaust systems, and in the case of some substances, such as silica dust, it is absolutely necessary to have this removed from the air at its source by proper

[11] Hamilton, Alice, M. D. Industrial Poisons in the United States. New York, Macmillan Co., 1925.

exhausts or by effective wet methods. (See also the section on Ventilation.)

Where lead is used, the worker must be protected by exhaust systems, and, depending on the process, by gloves and by individual respirators as well, and there must also be provision for frequent washing of hands and other exposed parts of the body. Food should never be eaten in the workroom where such poisons are used. (See also the section on Washrooms and Lunchrooms.)

No easy panacea exists for protecting workers from all poisons. There must be continual study of the use of new substances, the methods of their use, and the employment of better-known materials in new processes. For the substances that have been long in use in industry, protective measures are known. The United States Department of Labor publishes small pamphlets telling of the effects of certain industrial poisons and giving suggestions as to their prevention.

New processes are constantly developed and these may mean introducing new substances whose effects are less well known. This happened during the years 1914–18. In connection with the experience in munition plants at that time, Dr. Alice Hamilton states:

> There is no way of knowing how much illness and death resulted from the mad rush during the first months of the war, before the factories were in a position to carry on the work properly, to get out the product. Another thing that led to sickness in this work was its unfamiliarity. It involved new problems in engineering that had to be solved by men with little or no experience with these substances and reactions * * *. Undoubtedly also the newness of the substances employed and of their byproducts was responsible for many accidents. It is plain that in some plants the occurrence of a serious case of poisoning was the first thing that aroused the management to the fact that a certain process was really dangerous * * *. Such occurrences as [poisoning from nitrobenzol fumes, from TNT, or lung affections from nitrous fumes] were totally new experiences to the ordinary physician, and there was very little in the medical literature to help him * * * .

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IV. The Fine Work Many Women Perform Calls For Special Lighting

Workers in poorly lighted factories are, in effect, partly blindfolded. Minimum requirements are as follows:

1. Sufficient illumination varying with occupation.
2. Proper distribution of light to prevent glare and shadows.
3. Consideration of lighting problems in seating arrangements.
4. Special aids for very fine work.

The National Safety Council states that 15 to 25 percent of all industrial accidents are due to poor lighting.

In a steel machine shop in Chicago an additional lighting cost amounting to less than 2 percent of the pay roll produced an increase in production of 10 percent.

In Great Britain glasses to relieve eyestrain were furnished drawers-in in textile plants, and sorters of lamp filaments, which are about half the diameter of a human hair. Relief afforded increased output from 8 to 26 percent for drawing-in, 20 percent for filament sorting and mounting.

A detailed study of output and errors in typesetting under different grades of illumination found maximum fatigue when minimum light was provided. The quality of the work suffered, as judged by number of errors, until the illumination reached 24.5 foot candles.

Lighting is measured in "foot candles," one unit representing one standard candle at a distance of 1 foot. It is determined by a small measure that can be carried about in the plant. The following standards for artificial lighting are the minimum needs for workers in various occupations according to the Illuminating Engineering Society. The illuminating for natural lighting should be at least four times the minimum specified for artificial lighting.

	Foot candles
Automobile manufacture—Assembly line	50 to 100
Textile mills—	
Cotton—Spooling, spinning, drawing, warping, weaving, quilling, inspecting, knitting, slashing	20
Woolen—Twisting, dyeing	10
Drawing-in, warping—Light goods	15
Dark goods	30
Weaving—Light goods	15
Dark goods	30

	Foot candles
Steel and iron mills—Automatic machines, light and cold rolling, wire drawing, shearing, fine by line	15
Rubber manufacturing	10 to 20
Airplane—Repair departments	30 to 50
Foundries—Core making	20

V. Seats Are Vitally Important For Women Workers

Arrangements should be made so that women can change from a standing to a sitting position. The right kind of chair should be provided, adjustable to both the worker and the particular occupation.

The New York study of industrial seating made in 1921 found three striking facts about proper and improper seating:

1. Providing of chairs and tables suited particularly to the occupation increased production in a rubber factory so that 16 girls performed as much work as 20 had done before.

2. A foot-pedal operator who has to strain unduly to reach the pedal suffers from pelvic congestion with resulting harm to pelvic organs.

3. Addition of satisfactory foot rests and foot pedals in an electrical-supply factory eliminated much fatigue.

Women polishing metal could increase their output as much as 32 percent when special seats were provided that made it possible to work seated or standing, according to a British investigation.

In muscular work output has been found to increase from 2 to 13 percent when workers could alternate sitting and standing. Dr. Vernon, one of the foremost British authorities, concludes that such changes have even more effect than rest pauses.

VI. General Plant Sanitation and Safety Is Essential

Clean and well-ordered establishments are necessary for health of workers, and for their greatest production as well. This includes the following:

1. Washing facilities.

Washing facilities in convenient locations with hot and cold water, soap, and individual towels are essential, as is instruction in proper methods of use. Some more or less serious forms of skin infection (dermatitis) may result from many of the substances used in industry. When processes require

use of certain poisons, it is essential that hands be washed frequently.

A recent study in Pennsylvania of persons at work insulating wire whose skin came in contact with chlorinated naphthalene showed that this resulted in skin affections for about three-fourths of the workers reported. Children of parents having the dermatitis also were found infected as a result of the material being carried home on the skin and clothing of the worker. Both Pennsylvania and New York Departments of Labor found the disease could be prevented if, in addition to adequate ventilation, there were provided personal hygiene facilities including regular wash periods, provision of soap, cold cream, individual towels, and protective lotion.

In a study of industrial dermatitis, a noted Philadelphia skin specialist, Dr. Joseph V. Klauder, found numerous cases due to inadequate washing facilities or the use of harmful agents to remove foreign substances from the skin. "* * * an enormous number of cases of trade dermatitis are caused annually, not by substances encountered at work, but by their removal by methods harmful to the skin." For example, (1) a woman in a printing shop used turpentine and kerosene for many years in order to remove stains from her hands and forearms. Dermatitis involved these areas. A patch test with turpentine showed her sensitive to this substance. (2) A woman employed as a machine "seasoner" in a tannery experienced dermatitis of both hands. For many years she had been using hypochlorite of soda to remove stains from her hands and this material was the cause of the infection.

2. Adequately equipped lunch room, dressing room, and rest room.

These are necessary not alone for the convenience of the workers. A very real health hazard may result if food is eaten or street clothes are hung in the workroom where poisonous substances or tools that may carry poisons are in constant use. For example, among the measures to prevent occurrence of lead poisoning are lunch rooms and dressing rooms separate from the work place.

Working efficiency is reduced if work is continued a long time without food, according to studies made by Harvard University. Facilities for getting a good noon meal reduce sickness, absenteeism, and fatigue.

Margaret Bondfield, formerly at the head of the labor department in the British Cabinet, stated that in 1914 when cafeterias were put in British munitions plants men and women workers had, for the first

time, hot meals on workdays. Production, morale, and general health were favorably affected. In this country men coming to C. C. C. camps after a period of unemployment and consequent lack of proper food gain 8 to 10 pounds and their working efficiency is thus increased.

Adequate rest rooms also contribute to the efficiency of the work force.

3. Good drinking facilities.

Pure cool water should be provided in places convenient to workers, with individual cups or sanitary bubbling fountains. Drinking water can promote health or spread disease. The American Standards Association has established detailed specifications for sanitary drinking fountains, available from that organization and well summarized in the National Safety News, March 1939.

Water will carry disease germs due to impurities in the source of supply or any other impurities with which it may come in contact before it reaches the drinker's mouth. It may be contaminated during storage, distribution, cooling, or by the way in which it is served. These sources all should be carefully investigated.

Among the diseases known to have been transmitted by depositing of germs upon drinking devices are influenza, diphtheria, scarlet fever, measles, whooping cough, cerebrospinal meningitis, poliomyelitis smallpox, chickenpox, mumps, septic sore throat, syphilis, tuberculosis, pneumonia, and the common cold.

The effects of hot, heavy work in sapping strength and reducing production can be averted by additional supplies of salt to replace that lost through profuse sweating. Where heat fatigue may be a problem, salt tablets should be available in dispensers near drinking fountains. Dosage recommended is as follows:

	Tablets daily
Light to medium work	5 to 6
Medium to heavy work	8 to 10
Extra heavy, hot work	12 to 15

A large steel company in Ohio used to have as many as seven or eight cases of heat cramps and heat sickness a day during hot spells. They then began to install a few salt-dispensing machines with such good results that finally one was placed at every drinking fountain. In a later year, only one case of heat cramps occurred throughout the entire summer.

The medical director of an electrical-supply manufacturing company stated that cases of heat sickness had been common before the use of salt tablets. Cases have been rare since.

4. Separate toilets for women.

Toilets should be in locations convenient to workrooms. They should be kept in a sanitary condition. An adequate supply of toilet paper should be provided. Washing facilities should be located nearby. A ratio of at least 1 toilet facility to every 15 women is recommended by the Women's Bureau. It is important to have outside ventilation. More detailed recommendations also are made as to construction of toilets, materials to be used in bowls, and so forth. (See Women's Bureau Bul. 99.)

5. Ventilation.

Ventilation of the plant should have special attention based on scientific knowledge. This is of particular importance to the health of workers in defense industries, because injurious chemicals often must be used. Safe ventilation includes attention to temperature, humidity, air motion, and especially removal of injurious vapors, fumes, gases, and dusts peculiar to the industry. The following minimum requirements have been developed by experts in this field:

(1) Supply of fresh air of not less than 1,000 cubic feet per person per hour.

(2) Adequate air movement (20 to 40 feet per minute in winter and higher in summer).

(3) Relative humidity not to exceed 70 percent and preferably less.

(4) In work with poisonous vapors or dusts:
   (*a*) Prevent escape of gases and dusts in the air.
   (*b*) Use exhausts to remove these substances if they are present in the air.
   (*c*) Provide adequate ventilation and movement of the air.
   (*d*) Provide masks where necessary.

6. General plant housekeeping.

Every floor needs thorough daily cleaning to remove oils, grease, and materials which may cause falls and to remove dusts which may otherwise be health hazards. Falls accounted for

about 4,000 of the 27,000 compensated injuries in manufacturing in New York in 1937. Removal of dust from all surfaces also reduces fire and explosion hazards. Suction methods of cleaning are preferable. If sweeping is used, the floor must be moistened or sweeping compound used to prevent raising dust.

7. Provision of medical department.

It is essential in carrying out health and safety measures to have the services of an industrial physician, who may be continuously on duty or on call, and an industrial nurse.

> The well-qualified industrial nurse can produce financial returns. As an example, one plant of 400 employees reduced its accident frequency 50 percent, cut down number of days lost 87 percent, and decreased medical aid cases 54 percent through employment of an industrial nurse.

8. Committees of workers.

Every plant should have a committee to whom harmful conditions of all kinds may be reported, and who will cooperate with management in safety education work.

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STANDARDS ESTABLISHED BY STATES

Compliance with the safety, sanitary, and factory inspection laws of the State in which the work is performed should be the first requirement. Where State divisions of industrial hygiene exist, they should be consulted as to particular problems.[12]

STANDARDS REQUIRED IN FEDERAL ACTS

Where standards for labor have not been established by the State, it should be remembered that the Federal Public Contracts Act provides that no work shall be done in surroundings insanitary or hazardous or dangerous to health and safety of employees. This applies to supplementary materials as well as those contracted for.

[12] Industrial hygiene divisions have been established in the following States and Territories: California, Colorado, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, New Hampshire, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Hawaii, and the Philippine Islands.

VII. Practical Work Clothing For Women Prevents Injury

The following general standards should apply on this important matter:

1. Clothing must be reasonably comfortable in any temperature in which it is worn.
2. It must fit and not interfere with workers' movements.
3. It must afford adequate protection against the hazard for which it is designed.

[See National Safety Council, Safety Fashions for Women in Industry.]

Safety hats.—A large metal-products factory in the Middle West has standardized work clothing for their women factory employees with safety in mind. The safety hat is a light comfortable cap of attractive design, confining loose hair and yet standing up from the head sufficiently so that revolving machinery cannot catch in the cap and from there into the hair.

Illustrative of the need for protective caps around moving machinery is the case of a girl whose hair caught in a machine as she leaned over to tighten it. Her head was pulled into the moving parts of the machine.

Gloves.—Protective gloves or finger stalls of material suitable to the hazard should be used where hot or sharp-edged parts are handled, and in some cases where substances used may poison the skin. Cuts and burns and skin diseases are reduced by these precautions.

Uniforms.—Uniforms sometimes are needed, as, for example, to prevent skirts from getting caught in machinery. One company has designed for its women employees a jumper suit that fits snugly for this purpose and is provided in attractive colors. Such uniforms are useful in work such as airplane repairing, where climbing is necessary.

Shoes.—Falls are a major cause of women's injuries, ranking first in most States reporting. Major causes of these may be wet or slippery floors, unprotected stairways, cluttered aisles, and so forth, but shoes play an important part in such accidents. Thin soles, high heels, worn-out shoes are hazards. The general rules that heels must be sensible, no cut-out toes, and no bedroom slippers are sufficient in many plants.

Where special safety shoes are needed they should be provided and required. In a study of the 36 foot injuries occurring in a rubber factory in 1938 it was found that 22 could have been prevented by use of safety shoes and 7 others much reduced in severity.

Leggings, spats, and aprons.—These may be a safety necessity for certain operations. A large plate-glass company has devised a special foot protector for girls, covering the ankle and top of the foot.

Jewelry.—Jewelry may be the cause of painful injury, and should not be worn at work around machinery.

Goggles.—The necessity for goggles is evidenced by the fact that 80 percent of the 1,800 to 2,000 eye injuries occurring in New York every year are caused by flying bodies. In a metal factory employing 25,000 workers, $25,000 was spent on goggles with a resultant saving in two years of $116,000.

VIII. Moderate Hours of Work Result in Quality and Quantity Production

The hour standards that have been established in the past few years should be maintained. Such a policy is possible and essential in the defense program. Such a policy is sound, as it will mean jobs for more workers. Thus expanded production should lead to employment of many more persons. The millions of unemployed men and women constitute an available labor supply on which to draw.

The effort to speed up production should not lead to longer hours or overtime for those already employed. Industrial history during the last World War and since proves that this is a short-sighted policy, whereas reasonable and regular hours mean more efficient workers.[13]

The moderate working hours recently set up as standards are conducive to increased production and better quality of goods. Such hours are a highly effective means of safeguarding the workers against undue fatigue and conserving their energies to enable them to produce steadily under pressure over a long period.

1. Daily and weekly hours.

The basic schedule should not exceed 8 hours a day and 40 hours a week.

This schedule is the standard provided by the Public Contracts Act, and that to become effective October 24, 1940, under the Federal Fair Labor Standards Act. In recent years many plants have adhered to this schedule and found it satisfactory.

[13] See U. S. Department of Labor, Women's Bureau, Bull. No. 43, Standard and Scheduled Hours of Work for Women in Industry. Washington, D. C., 1925, pp. 1–10.

The following are typical illustrations of the value of moderate hours to a program of expanded production:

The 8-hour day.—An investigation by a committee of Federated American Engineering Societies, of continuous-process industries that had changed from 12-hour to 8-hour shifts, showed that no technical difficulties were encountered, and where good planning and care in execution were used, the effect on quality and quantity of production was satisfactory. For some plants in practically every major continuous-process industry there was reported an increase in production of 25 percent or more per man and a marked decrease in absenteeism and labor turnover.[14]

A report published in 1919 by the National Industrial Conference Board, on a survey of hours of work, contained the following statement by a representative of a large firm (conducting practically all branches of metal manufacturing) in regard to its change to an 8-hour day from longer hours: "We are convinced * * * that the shorter day does conduce to a larger output, better quality of work, better health conditions, to the decrease in the number of accidents, and to the contentment of our workers." [15]

The 40-hour week.—The United States Government Printing Office after changing to a 5-day week (40 hours) in 1932 reported that the production per employee had increased by from 4 to 10 percent and that the daily output of the plant was greater than in the 5½-day week (44 hours).[16]

2. Days of rest.

At least one and a half, and preferably two, days of rest should be allowed in every seven days.

The value of such a break in working time in terms of health and efficiency of women workers was stressed in a report by a committee on health of munition workers in Great Britain in 1915. This report dealt also with the detrimental effects of the long hours, including the 7-day week, that had been used during the first year of the first World War with the hope of speeding up production. The study proved the value of the changed policy of shorter hours. The following excerpts from the report are of interest:

"If the maximum output is to be secured and maintained for any length of time, a weekly period must be allowed. Except for quite

[14] Federated American Engineering Societies. Committee on Work Periods in Continuous Industry. The Twelve-Hour Shift in Industry. 1922. pp. 13–14.

[15] National Industrial Conference Board. Research Report No. 18. Hours of Work as Related to Output and Health of Workers: Metal Manufacturing Industries. July 1919.

[16] U. S. Printing Office. Annual Report of the Public Printer. Washington, D. C. 1932, 1933.

short periods, continuous work * * * is a profound mistake and does not pay * * * output is not increased.[17]

"The importance to women of a wise limitation of their hours of work and an appropriate distribution of the pauses in those hours can hardly be overstated. The weight of scientific evidence is behind such limitation, and without it health and efficiency cannot be maintained. The week-end rest has been found a factor of such importance in maintaining health and vigor that it has been reinstated by employers who had taken it for work at the beginning of the war. The committee are strongly of the opinion that for women and girls a portion of Saturday and the whole of Sunday should be available for rest." [18]

3. Time for meals.

A regular time should be set for any meal eaten at the plant, the period allowed varying from 30 to 60 minutes according to circumstances.

Working efficiency is reduced if work is continued a long time without food, according to studies made by Harvard University.[19]

Where lunch facilities are such as to make a half-hour meal period practicable, workers often prefer this to a longer break in the work schedule in order to have an earlier closing period.

4. Rest periods.

A rest of at least 10 minutes in the middle of each 4-hour period without lengthening the workday is essential. The worker should not have to pay for such rest periods.

A report by the National Industrial Conference Board in 1919 gives definite data on the value of rest periods, compiled in a survey of 104 establishments in the United States, after they had introduced rest periods. Many firms reported an improvement in quality of work, especially where the task required concentrated attention. The management of an establishment employing 13,000 women stated, "We feel that it pays in output and quality of work to have rest periods." [20] Analysis of another study showed that in various occupations the immediate effect of allowing a rest period was to increase the output 2.8 percent, and in other groups tested some months after introduction of the rest period output had increased 6.2 percent.[21]

[17] Great Britain. Ministry of Munitions. Health of Munition Workers Committee. Memorandum No. 1. 1915.

[18] Great Britain. Ministry of Munitions. Health of Munition Workers Committee. Memorandum No. 4, Employment of Women. 1915.

[19] Journal of Industrial Hygiene. Industrial Fatigue, September 1936, vol. 18, p. 417.

[20] National Industrial Conference Board. Research Report No. 13, Rest Periods for Industrial Workers. 1919.

[21] British Industrial Fatigue Research Board, Report No. 47, 1928. p, 16.

Employees coming under the Fair Labor Standards Act must be paid for short rest periods (up to and including 20 minutes), the Administrator of the Act has decreed.

5. Overtime.

Overtime should be avoided as far as possible. The following illustrations stress the detrimental effects of overtime:

The report by the British Committee on the Health of Munition Workers, already referred to, stated: " * * * flagging output * * * characterizes the last hours of overtime during the day, and it is stated that the disadvantages of the overtime system are being increasingly recognized by employers." [22]

The decreased efficiency characteristic of overtime work is shown by a study of output in relation to hours in a motor plant on an 8-hour day and a metal plant on a 10-hour day. In the last hour of the day, even when allowance was made for stoppage of machinery, and so forth, the 8-hour plant had an output 10.2 percent below its own efficiency but the 10-hour plant showed a decline of 20.9 percent.[23]

When overtime is necessary it should be spread among all available workers. Overtime wages should be time and a half the regular rate of pay for each hour in excess of the 8 hours a day or 40 hours a week.

IX. Minimum-Wage Standards and Prevailing-Wage Standards Should Be Maintained

The health, morale, and efficiency of women as workers can be maintained only if they are paid wages sufficient to enable them to buy the necessities of life, and wages that are commensurate with the services rendered.

1. Minimum rates.

The rates set by the Secretary of Labor under the Public Contracts Act are required in plants in the various industries operating under contract with the Federal Government.

All minimum rates set up under the Federal Fair Labor Standards Act must be complied with by all establishments covered by the law. The act permits no wage differentials on the basis of age or sex.

[22] Great Britain. Ministry of Munitions. Health of Munition Workers Committee. Memorandum No. 4, Employment of Women. 1915.

[23] U. S. Public Health Service. Bulletin 106, "Comparison of an Eight-Hour Plant and a Ten-Hour Plant," * * * February 1920.

Existing State minimum-wage rates must be complied with by all establishments covered unless such rates are superseded by Federal rates.

2. Wage policies.

Rates should be based on occupation and not on sex or race of the worker.

The standard of wages prevailing for men should not be lowered where women are employed.

Certain uniform practices in setting wage rates are essential to the good of all concerned. Effort should be made to arrive at clearly defined occupations or standard rates, whether computed by the hour or by the piece.

3. Overtime rates.

The rate of pay for all hours in excess of the basic hour schedule should be at least one and a half times the regular rate which a woman is paid.

4. Wages and living costs.

Wage rates should be revised periodically and adjusted to marked rise in cost of living.

X. Training and Employment Policies Should Be Adjusted To Women's Needs

The program of rapidly expanded production in defense industries calls for sound employment policies; otherwise, discontent among workers and dislocation among industries may result, and retard and cripple the program unduly. On the other hand, elimination of causes of friction will make for a satisfied and satisfactory labor force and greater output.

Such policies must be carefully worked out from the viewpoint both of the defense program and of normal manufacture of goods. The situation must be analyzed in regard to men and women workers, both those having jobs and those seeking jobs. Attention must be given to the needs of the present situation in relation to future needs, particularly the period just following the completion of the emergency program.

1. Dislocation.

Effort should be made to prevent dislocation in industry that is bound to result if women and men are drawn from their regular jobs into expanding defense industries. The present emergency program is not so acute as was that during the World War, when considerable sudden shifting of women to take men's jobs was essential. Also today there are large numbers of men and women available for the new jobs.

> In the World War the "quick shift from a peace to a war footing contributed as much at first to the dislocation of normal industrial conditions as did the drafting of millions of men from the ranks of producers to the service in the Army and Navy." [24]

2. Training.

Women should be trained for those jobs in defense industries for which experience has shown women to be fitted, and also for other new jobs suited to their physique.

3. Training methods.

Training in the plant usually is necessary for workers employed for processes new to them, but in many instances women may require somewhat more extensive training than men require. This is due to the fact that girls are not given the same opportunity in vocational schools to secure a general mechanical training and background.

Women should be trained in a special section before being assigned to the production room, especially for work in divisions hitherto staffed by men. This arrangement permits the weeding out of unsuitable workers and the developing of the best methods. It also prevents the slowing up of work in the production room that is bound to result from the presence and efforts of inexperienced persons.

When a foreman must train women, care should be taken to choose one who is willing and able to do this task, and who understands the lack of knowledge of mechanical terms on the part of many women.

[24] U. S. Department of Labor, Women's Bureau, Bul. 12, The New Position of Women in American Industry. Washington, D. C., 1920. p. 2.

During the period of 1914–18 the training section for women varied in size from one set up in the corner of a large workroom to large establishments giving intensive training to women workers. The typical school trained about 30 women at a time. Arithmetic, blueprint reading, the use of measuring instruments, were taught in addition to the operation of the essential machines. The length of the course varied from 10 days to 3 weeks.

Training in the plant should be a legitimate expense of the employer. Women as trainees should be paid an hourly rate until they are ready to go on into regular production work.

4. Personnel management.

The appointment of a competent person as employment executive where women are employed, with responsibilities for conditions and policies especially affecting women, is necessary. A well-qualified woman in such a position usually will get the best results.

5. Collective bargaining.

Opportunity should be given women workers to participate in trade-union organization and collective bargaining, which have been established by law as fundamental rights.

Women should be included among employee representatives charged with responsibilities for maintenance of existing standards or development of other desirable standards.

XI. Industrial Home Work Should Be Prohibited on Government Contracts

Home manufacture of industrial products is not likely to result in best production methods. During the World War disease and dirt were found in many homes where the sewing on Army goods was done, the women in these tenements working early and late to complete their tasks. Army overcoats were found in homes, piled in the dark bedrooms and in heaps on dirty floors.

Pay for industrial processes done in the home ordinarily is found to be far below pay in the factory, and it frequently is

true that several members of the family, including small children, must work to obtain these earnings.

Twenty States have industrial home-work regulation: California, Colorado, Connecticut, Illinois, Indiana, Maryland, Massachusetts, Michigan, Missouri, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, West Virginia, and Wisconsin.

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