

FEDERAL WORKS AGENCY
WORK PROJECTS ADMINISTRATION

F. C. HARRINGTON
Commissioner

CORRINGTON GILL
Assistant Commissioner

NATIONAL RESEARCH PROJECT

on

Reemployment Opportunities and Recent Changes
in Industrial Techniques

DAVID WEINTRAUB
Director

In cooperation with

EMPLOYMENT STABILIZATION RESEARCH INSTITUTE
UNIVERSITY OF MINNESOTA

RUSSELL A. STEVENSON, Director

CHARLES A. KOEPKE, Supervisor of Job Analysis Survey

45086

Dhananjayrao Gadgil Library



GIPE-PUNE-045086

**CHANGES IN MACHINERY AND JOB REQUIREMENTS
IN MINNESOTA MANUFACTURING, 1931-36**

*A Second Survey of Production Work in Plants of the
Minneapolis-St. Paul Area*

by

Charles A. Koepke

with the assistance of

S. Theodore Woal

WORK PROJECTS ADMINISTRATION, NATIONAL RESEARCH PROJECT

In cooperation with

EMPLOYMENT STABILIZATION RESEARCH INSTITUTE

UNIVERSITY OF MINNESOTA

Report No. L-6

Philadelphia, Pennsylvania

July 1939

APPENDIXES

Appendix	Page
A. OPERATION SHEET FOR FIELD WORK	56
B. SKILL CLASSIFICATION OF INDUSTRIAL JOBS.	58

APPENDIX A

OPERATION SHEET FOR FIELD WORK

EMPLOYMENT STABILIZATION RESEARCH INSTITUTE UNIVERSITY OF MINNESOTA OPERATION SHEET FOR JOB ANALYSIS

Firm No.
 Part Name Part No. Number of Op. on this part
 Operation No. Operation Name
 Description of work done during operation (see over for pictorial representation)

Actually From Worker on This Operation

1. Sex—M F 2^a Age—Use code
- 3.^a Actual disabilities
4. Major previous occupation, length of service, and where
5. Length of service on this operation

Characteristics of Worker On This Operation

1. Age limits for hiring—Under 30 30 to 45 Over 45
2. Special requirements — Smell Taste Clerical
Hearing Touch Ambidextrous Left Hand
3. Tools worker should own Kit
Incidental tools None toolmakers, carpenters, etc.
4. Tools worker must use
5. Training time necessary to work undirected on this operation
- 6.^a How is training received (use code)
7. What other operations has this operator performed satisfactorily in this plant
- 8.^a Classification of worker—A B C D E
9. Calculate on job—Yes No If so specify type of calculation

THE WORK

1. Weight—100 lbs. and up 10 lbs. to 100 lbs. 1 lb. to 10 lbs. 1 oz. to 1 lb.
2. Strength needed most—Back Legs Arms and hands
3. Dexterity—Finger Hand Arm Foot
4. Position—Stand Sit Stoop Reach Walk
5. Transportation } to operation
of material } from operation
- 6.^a Machine set-up—Complicated Simple Done by others
7. Accuracy—Gage or mike Scale or rule None
8. Does operation require reading of blue prints—Yes No
9. Continuous production Job production (few only)
10. Working conditions—Good Hot Cold Humid
Fumes Dusty Dirty Oils Acids Poor ventilation
11. Location of job—Inside Outside
12. Sanitation—Common drinking cup St. jet An. jet
Dirty fountain Individual toilets Trough toilets
Dirty toilets
13. Lighting (ft. candles)—Natural Artificial
14. Hazards and safety precautions
15. No. of pieces, lbs., etc. per hour (av. from time on 10 units "as is")
16. Method of pay.—D.W. P.W. Premium Std. T.
Group
17. Are time studies used to set rates? Yes No
18. Team work Individual work Paced Set own pace
19. Normal number of hours per week
20. Rate of pay translated to 44-hour week \$
21. No. of men on this op. No. of pieces per unit
22. Type of fixture used
23. Material used
24. Cutting tool material F.P.M.
25. Average production per 8 hrs. in normal times
26. Ultimate product

The Machine On This Operation

1. Type of machine, name and size General purpose Special purpose
2. Machine—Strictly automatic Tools preset, but manually operated Strictly manual
- 3.^a Age of machine (use code) Condition of machine—Excellent Good Poor
4. Are better machines or methods available
5. Would better machines or methods be economical on this operation with above average production. Yes No
6. Remarks

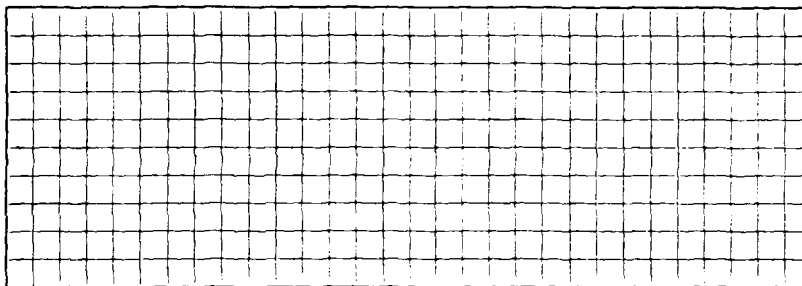
Observer
Name in full

EXPLANATORY DATA

Photographs of part after operation

Photographs of fixtures used

Explanatory sketches



Definitions

- Code for Training Received**
- 0. No training
 - 1. Instruction by foreman
 - 2. Working with experienced operator
 - 3. Special training instruction
 - 4. Vestibule school
 - 5. Vocational school
 - 6. Apprenticeship
 - 7. High school
 - 8. College
 - 9.

- Machine Set-up**
- Check type of set-up and whether done by others:
- Actual Disability**
- Loss of arm, hand, fingers, speech, sight, hearing, leg, foot.

- Code for Age of Machines**
- 0. Less than 1 year
 - 1. 1 to 3 years
 - 2. 4 to 9 years
 - 3. 10 to 15 years
 - 4. 16 to 21 years
 - 5. Over 21 years

- Code for Employee's Age**
- 0. 10-17
 - 1. 18-19
 - 2. 20-24
 - 3. 25-34
 - 4. 35-44
 - 5. 45-54
 - 6. 55-64
 - 7. 65-74
 - 8. 75-over

APPENDIX B

SKILL CLASSIFICATION OF INDUSTRIAL JOBS

The following classification was used in grouping workers by skill for this study (see especially chapter IV and table 15):

Class A: Skilled Mechanics, Grade 1

The jobs in this class require men who are masters of their trade, who understand their work thoroughly and comprehensively, and who are competent to work without immediate supervision. They necessitate the exercise of considerable judgment, accuracy without the use of jigs or other special equipment, and considerable initiative within the limits of the particular trade. Involved experimental work and high-grade production or tool work for which a general knowledge of all machines, tools, and materials of construction is necessary belong in this class. A list of jobs included in class A follows:

- Art stonecutters
- Assemblers of delicate precision equipment
- Die sinkers
- Electrotypers
- Engravers
- Filers on dies and gages
- Goldsmiths
- Head flour millers
- Lapidaries
- Master paper makers
- Pattern and model makers
- Printers of high-class color or offset work
- Silversmiths
- Tool makers
- Watchmakers

Class B: Skilled Mechanics, Grade 2

The jobs in this class differ from those in class A largely in that they are repetitive. Whatever difficulties an operation in this class presents are for the most part solved after

it has been performed several times. It may or may not continue to require the same degree of manipulative dexterity, but it does not continue to require as much exercise of judgment. The skill necessary for the jobs in class B is definitely less, therefore, than that in class A.

Class B jobs are partly preplanned, and they require more supervision than jobs in class A. In general, heavy jobs which must be accurate and smaller jobs which require accuracy without the use of special fixtures but which are nevertheless somewhat repetitive belong in this class. Workers on such jobs must know machines, speeds, and construction materials; they must also know how to read blueprints and how to use precision instruments.

This class also includes a large group of jobs not usually performed by factory labor - bricklaying, general baking, plastering, plumbing, paperhanging, etc. A list of jobs included under class B follows:

- Bakers in general bread bakeries
- Beverage compounders
- Blacksmiths
- Boilermakers
- Butchers
- Butter makers
- Cabinetmakers
- Carpenters, all round
- Carpenters, finish
- Casters in foundries
- Cigar makers, hand
- Compositors
- Coppersmiths
- Custom job assemblers on operations that require fitting and adjusting (as on locomotive and gas engines)
- Custom machine grinders
- Dyers
- Electricians
- Founders in type foundries
- Gas and steam fitters
- Glaziers on building work
- Heat treaters
- Linotypers
- Machinists, general tool and railroad

Metal buffers and polishers
Milliners on custom work
Millwrights on high-class machines
Molders
Paperhangers
Plasterers
Plumbers
Saw filers
Screw-machine setters
Sheet-metal workers
Stonecutters
Stonemasons
Tile layers
Tinsmiths
Toolsmiths
Typesetters
Upholsterers
Weavers

Class C: Semiskilled Operators, Grade 1

The jobs in this class require machine operators rather than mechanics. The operations are highly repetitive; day after day and week after week the worker repeats the same operation, whether by hand or by machine. For these jobs, however, he must still have considerable ability in the use of gages and in other methods of control. The work is preplanned, and the tools are usually preset, but the operator knows the machine and is able to make adjustments on it. A list of jobs included under class C follows:

Annealers
Carpenters, rough
Cement finishers
Coopers
Cutters in packing plants
Dressmakers in factories
Drop-forgers
Forgemen
Furnace men in metal industries
Glass blowers in factories
Glaziers in factories
Hammermen in metal industries

Hand painters on building work
Loom fixers
Machine carvers
Machine cigar makers
Machine knitters
Marble polishers
Millwrights on general repairs (handy men)
Mule spinners
Pasteurizers
Pottery decorators
Pottery-machine operators
Pourers in metal industries
Puddlers in metal industries
Rollers and roll hands in metal industries
Roofers
Repetitive line assemblers for accurate fitting work
Sawyers
Slaters
Smeltermen
Spray painters
Stationary engineers
Structural-iron workers
Textile nappers
Wool card tenders

Class D: Semiskilled Operators, Grade 2

The operations in this class are extremely simple and highly repetitive, and they need only a short training period - 3 weeks or less. They require little exercise of judgment on the part of the worker; ordinary dexterity or the ability to load and unload machines and to perform simple hand operations are the main qualifications. A list of jobs included under class D follows:

Assemblers on simple line assembly
Bakery-machine operators
Bag-factory operators
Book gatherers
Bottle washers
Bottlers
Cigar-factory strippers
Cranemen

NO CODE
ENTERED