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TITLE	Coil Opener and Down Ender Operator (iron & steel) 7-88.305; Conveyor Man (iron & steel) 7-88.300; Cooling Conveyor Operator (iron & steel) 7-88.241; Tester Conveyor Operator (iron & steel) 7-88.241; Thread Entry Conveyor Operator (iron & steel) 7-88.241; Yard Transfer Conveyor Operator (iron & steel) 7-88.241--Technical Report on Standardization of the General Aptitude Test Battery.
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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

COIL OPENER AND DOWN ENDER OPERATOR (iron and steel) 7-88.305
CONVEYOR MAN (iron and steel) 7-88.300
COOLING CONVEYOR OPERATOR (iron and steel) 7-88.241
TESTER CONVEYOR OPERATOR (iron and steel) 7-88.241
THREAD ENTRY CONVEYOR OPERATOR (iron and steel) 7-88.241
YARD TRANSFER CONVEYOR OPERATOR (iron and steel) 7-88.241

B-524 S-247

U. S. Employment Service
in Cooperation with
Texas State Employment Service

April 1963

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

COIL OPENER AND DOWN ENDER OPERATOR (iron and steel) 7-88.305
CONVEYOR MAN (iron and steel) 7-88.300
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THREAD ENTRY CONVEYOR OPERATOR (iron and steel) 7-88.241
YARD TRANSFER CONVEYOR OPERATOR (iron and steel) 7-88.241

B-524

Summary

The General Aptitude Test Battery, B-1001, was administered to a final sample of 64 applicants who were later employed by the Lone Star Steel Company in Conveyor Operator jobs. The criterion consisted of supervisory ratings. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data and their combined selective efficiency, Aptitudes G-Intelligence, S-Spatial Aptitude and M-Manual Dexterity were selected for inclusion in the final test norms.

GATB Norms for Coil Opener (iron and steel) 7-88.305, Conveyor Man(iron and steel) 7-88.300, Cooling Conveyor Operator (iron and steel) 7-88.241, Tester Conveyor Operator (iron and steel) 7-88.241, Thread Entry Conveyor Operator (iron and steel) 7-88.241 and Yard Transfer Conveyor Operator (iron and steel) 7-88.241, B-524.

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
G	CB-1- H CB-1- I CB-1- J	70	G	Part 3 Part 4 Part 6	~~70~~ 65
S	CB-1- F CB-1- H	80	S	Part 3	75
M	CB-1- M CB-1- N	75	M	Part 9 Part 10	75

Effectiveness of Norms

The data in Table IV indicate that only 66 percent of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 88 percent would have been good workers. 34 percent of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 12 percent would have been poor workers.

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the following occupations in the iron and steel industry:

COIL OPENER AND DOWN ENDER OPERATOR 7-88.305
CONVEYOR MAN 7-88.300
COOLING CONVEYOR OPERATOR 7-88.241
TESTER CONVEYOR OPERATOR 7-88.241
THREAD ENTRY CONVEYOR OPERATOR 7-88.241
YARD TRANSFER CONVEYOR OPERATOR 7-88.241

II. Sample

The General Aptitude Test Battery, B-1001, was administered from July 1952 through February 1959 to 64 applicants who were later employed in the above Conveyor Operator jobs by the Lone Star Steel Company, Longview, Texas. An interview was the only basis for selecting individuals for employment in these jobs. All workers in this sample had completed the minimum training period of six months.

TABLE I

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion-Corrected for Broad Categories (r) for Age, Education, and Experience

N =64	M	σ	Range	r
Age (years)	36.8	7.7	23-54	.150
Education (years)	10.7	2.5	1-16	.098
Experience (months)	44.5	23.1	12-72	-.060

III. Job Description

Job Title: COIL OPENER AND DOWN ENDER OPERATOR (iron and steel) 7-88.305

Job Summary: Sets up and operates tilt table, feed spool, leveling rolls and up-cut shear; using button controls, feeds flattened coils of skelp onto conveyor.

Job Title: CONVEYOR MAN (iron and steel) 7-88.300

Job Summary: Operates conveyors, transfer tables, kick-off arms, pick-up arms, bumper stops, chain conveyors and a jet wash-out station, using button controls to move electric welded steel pipe from the rotary straightener, across inspection tables, to the exit transfer table, and to the finishing department; or from the cut-off exit table to the upsetter feed table; or from the upsetter exit table across the wash-out table to the facing and threading machines; or from the inspection rack to the testers or to kick-off pocket for storage.

Job Title: COOLING CONVEYOR OPERATOR (iron and steel) 7-88.241

Job Summary: Operates conveyors, pick-up and kick-off arms, using button controls to move welded steel pipe through normalizing furnace, across cooling tables where pipe is sprayed with water for cooling, and to the cold sizing machine.

Job Title: TESTER CONVEYOR OPERATOR (iron and steel) 7-88.241

Job Summary: Operates a conveyor, kick-off and pick-up arms, using button controls to move electric welded steel pipe from inspection tables to coupling screw-on machines.

Job Title: THREAD ENTRY CONVEYOR OPERATOR (iron and steel) 7-88.241

Job Summary: Operates a conveyor, kick-off and pick-up arms, using button controls to move electric welded steel pipe from the thread transfer table to any of five pairs of pipe threading machines.

Job Title: YARD TRANSFER CONVEYOR OPERATOR (iron and steel) 7-88.241

Job Summary: Operates conveyors, transfer tables, pick-up and kick-off arms, using button controls to move two lines of electric welded steel pipe from protector placer tables, through the paint machines, to the pipe storage yard.

IV. Experimental Battery

All the tests of the GATB, B-1001 , were administered to the sample group.

V. Criterion

The criterion consisted of broad category ratings made by the production superintendent. These ratings were collected from May 1960 through July 1962. Each worker was rated as being above average, average or below average with regard to his on-the-job production. These qualitative ratings were converted to the following final criterion scores:

Group	N	Final Criterion Score
Above Average	21	61
Average	21	50
Below Average	22	39

VI Qualitative and Quantitative Analyses

A. Qualitative Analysis

On the basis of the job analysis data, the following aptitudes were rated "important" for success in this occupation:

Motor Coordination (T), Finger Dexterity (F) and Manual Dexterity (M) - required in operating conveyors, kick-off and pick-up arms, using button controls to move electric welded steel pipe.

On the basis of the job analysis data, V-Verbal Aptitude and N-Numerical Aptitude were rated "irrelevant" for successfully performing the duties of this job.

B. Quantitative Analysis:

TABLE II

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (Corrected for Broad Categories) (r) for the Aptitudes of the GATB; N = 64

Aptitudes (GATB, B-1001)	M	σ	r
G-Intelligence	92.1	15.7	.257*
V-Verbal Aptitude	87.2	11.9	.095
N-Numerical Aptitude	90.9	16.9	.161
S-Spatial Aptitude	97.4	18.1	.450**
P-Form Perception	87.4	16.6	.408**
Q-Clerical Perception	74.1	14.2	.139
A-Motor Coordination	70.3	18.5	.341**
T-Motor Speed	72.6	17.5	.318*
F-Finger Dexterity	94.7	20.0	.557**
M-Manual Dexterity	94.3	18.6	.548**

*Significant at the .05 level
**Significant at the .01 level

C. Selection of Test Norms:

TABLE III
Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes									
	G	V	N	S	P	Q	A	T	F	M
Job Analysis Data										
Important								X	X	X
Irrelevant		X	X							
Relatively High Mean				X					X	X
Relatively Low Sigma		X				X				
Significant Correlation with Criterion	X			X	X		X	X	X	X
Aptitudes to be Considered for Trial Norms	G			S	P		A	T	F	M

Trial norms consisting of various combinations of Aptitudes G,S,P,A,T,F & M with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1001 norms consisting of G-70, S-80, and M-75 had the best selective efficiency. Equivalent B-1002 norms are G-70, S-75, and M-75.

VII. Validity of Norms

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 34 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV shows the relationship between B-1002 norms consisting of Aptitudes G, S and M with critical scores of 70, 75 and 75, respectively, and the dichotomized criterion for Coil Opener and Down Ender Operator (iron and steel) 7-88.305, Conveyor Man (iron and steel) 7-88.300, Cooling Conveyor Operator (iron and steel) 7-88.241, Tester Conveyor Operator (iron and steel) 7-88.241, Thread Entry Conveyor Operator (iron and steel) 7-88.241, and Yard Transfer Conveyor Operator (iron and steel) 7-88.241. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV

N = 64	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	4	38	42
Poor Workers	17	5	22
Total	21	43	64

Phi Coefficient = .68

$X^2 = 30.029$

$P/2 < .0005$

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes G, S and M with minimum scores of 70, 75 and 75, respectively, have been established as B-1002 norms for Coil Opener and Down Ender Operator (iron and steel) 7-88.305, Conveyor Man (iron and steel) 7-88.300, Cooling Conveyor Operator (iron and steel) 7-88.241, Tester Conveyor Operator (iron and steel) 7-88.241, Thread Entry Conveyor Operator (iron and steel) 7-88.241, and Yard Transfer Conveyor Operator (iron and steel) 7-88.241. The equivalent B-1001 norms consist of G-70, S-80 and M-75.

IX. Determination of Occupational Aptitude Pattern

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 35 OAP's included in Section II of the Guide to the Use of the General Aptitude Test Battery, January 1962. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.