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ABSTRACT

The Occupational Report (OR) is a computer-generated report that provides occupational information for planning vocational rehabilitation services. Input data includes raw scores from the USES (United States Employment Service) Interest Inventory and raw scores from either the General Aptitude Test Battery or the Non-Reading Aptitude Test Battery. The OR generates: (1) an occupational interest profile with 12 ranked interest areas; (2) an occupational aptitude profile with nine ranked aptitudes; and (3) lists of work groups for which the client has high-level and medium-level aptitudes for success. The OR may generate a list of supplementary work subgroups for which individuals who function below minimal aptitude levels possess employment potential. The OR will run on most IBM-compatible computers. Includes 13 references. (JDD)

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Manual for the Occupational REPORT

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Arkansas Rehabilitation Services

230 887



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Manual for the Occupational Report

Brian Bolton

June, 1987

**Arkansas Research and Training Center In Vocational Rehabilitation
University of Arkansas, Fayetteville
Arkansas Rehabilitation Services**

Overview

- *** The Occupational Report (OR) is a computer-generated report that provides occupational information essential in planning vocational rehabilitation services.
- *** Input data required by the OR includes: (a) raw scores from the USES Interest Inventory, and (b) raw scores from either the General Aptitude Test Battery (GATB) or the Non-Reading Aptitude Test Battery (NATB).
- *** The OR generates: (a) an occupational interest profile with 12 interest areas ranked from high to low, (b) an occupational aptitude profile with 9 aptitudes ranked from high to low, (c) a list of work groups for which the client has suitable (high level) aptitudes for success, and (d) a list of work groups for which the client has minimal (medium level) aptitudes for success.
- *** The OR may generate a list of supplementary work subgroups for which individuals who function below minimal aptitude levels possess employment potential.
- *** Written in BASIC for MS DOS machines, the program will run on most IBM compatible machines. Arrangements to administer the GATB, NATB, and USES-II must be made with the local office of the state employment service.

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Manual for the Occupational Report

Introduction

Assessment of vocational aptitudes and occupational interests is central to the vocational rehabilitation (VR) planning process (Bolton, 1987; 1988). To achieve successful job placement, which is the ultimate goal of VR services, suitable occupations must be located for persons with handicaps. The Occupational Report (OR) was developed to facilitate this goal by translating an individual's aptitudes and interests into lists of feasible occupational areas.

The conceptual framework upon which the OR is based is the U. S. Department of Labor's "Counselor Assessment/Occupational Exploration System." The key to the DOL's System is the Guide for Occupational Exploration (GOE), which organizes all 12,000 occupations in the U.S. labor force according to their predominant interests and essential aptitudes. Thus, standardized measures of occupational interests and vocational aptitudes are required to accurately identify suitable occupations.

The 12,000 occupations were allocated to one of 12 interest categories that correspond to the 12 interest scales of the United States Employment Service Interest Inventory (USES-II). Because the occupations within each of the 12 interest areas are extremely heterogeneous with respect to aptitudes required, it was necessary to cluster occupations within the interest categories. This task was accomplished by identifying 66 work groups, each with corresponding Occupational Aptitude Patterns (OAPS), that are measured by the General Aptitude Test Battery (GATB) or Non-Reading Aptitude Test Battery (NATB).

Thus, each of the 66 work groups is characterized by a unique combination of interest preference and minimal aptitude requirement. The fundamental principle underlying the GOE, then, is as follows: Vocational adjustment is a function of both requisite abilities and an interest in the activities comprising the occupation. However, an important corollary to this principle must also be stated: Abilities are necessary but not sufficient for successful vocational adjustment; interests are not necessary, but may determine ultimate success, given the requisite abilities.

In summary, the 12 interest areas and 66 work groups form the core structure of the Guide for Occupational Exploration, which is the most useful and accessible source of occupational information for VR counselors currently available, because it is organized in terms of measureable

occupational traits. The Occupational Report (OR) presents this occupational information to VR specialists as a readily produced computer-generated report.

The USES-II

An interest is an attitude or feeling that an activity is of concern to oneself, and/or the tendency to give selective attention to that activity. An interest inventory is a series of questions concerning activities to which an individual indicates preferential responses. The United States Employment Service Interest Inventory (USES-II) is a self-report instrument that measures the respondent's relative strength of interests in 12 broad categories of occupational activity (see Table 1).

The USES-II consists of 162 items of three types: (a) job activity statements (e.g., guard airport security, sell life insurance, and conduct studies on economics), (b) occupational titles (e.g., biologist, dairy farmer, and bookkeeper), and (c) life experiences (e.g., play a musical instrument, tour a tree nursery, teach surfboard riding). The examinee responds to each item using a 3-choice format: Like (L), Dislike (D), or Not Sure (?). Only the "Like" responses are counted as preferences in calculating interest area scores.

The USES-II can be appropriately used with the general adult population aged 16 years and older. The reading level required by the 162 items is about third grade. An audio-tape version for administration to poor readers can be prepared easily. Administration of the USES-II to individuals or groups of examinees is a straightforward task that can be accomplished by a psychometric aide or trained secretary; completion time is about 15 to 20 minutes. Directions for administering the USES-II are detailed in the Manual (Intran Corporation, 1982). Hand-scoring of the USES-II is simple and quick, not even requiring the use of scoring stencils.

The USES-II was administered to 6,530 persons, half of whom were high school seniors, trade school, or college students, and half of whom were out-of-school job applicants, employed workers, or adults in occupational training programs. This sample, which included Black, Hispanic, American Indian, and Oriental respondents and approximately equal numbers of males and females, constitutes the normative sample for the calculation of USES-II standard scores which are generated by the OR.

The USES-II is the product of a careful program of developmental research (see Bolton, 1985). Factor analysis

Table 1

USES Interest Inventory Scales

1. Artistic: Interest in creative expression of feeling or ideas, such as the performing arts or drama, music or dance, the visual arts of painting or sculpturing, or literary arts of writing and editing.
2. Scientific: Interest in discovering, collecting, and analyzing information about the natural world and applying scientific research findings to problems in medicine, and life or natural sciences.
3. Plants & Animals: Interest in activities involving plants and animals, usually in outdoor settings, such as farming, taking care of or training animals, or forestry types of endeavors.
4. Protective: Interest in the use of authority to protect people and property, such as the field of fire fighting, law enforcement, or security services.
5. Mechanical: Interest in applying mechanical principles to practical solutions, using machines, handtools, or techniques, such as skilled trades, engineering, construction, mining, or operating vehicles.
6. Industrial: Interest in repetitive, concrete, or organized activities in a factory setting, such as setting up machines, or using handtools or one's hands to manufacture things.
7. Business Detail: Interest in organized, clearly defined activities requiring accuracy and attention to detail, usually in an office setting, such as keeping records or typing.
8. Selling: Interest in bringing others to a point of view through personal persuasion, using sales and promotion techniques in fields that deal directly on a one-on-one basis with others.
9. Accommodating: Interest in catering to the wishes of others, usually by providing services for the convenience of them, such as hospitality services or personal services.
10. Humanitarian: Interest in helping others with their mental, social, spiritual, physical, or vocational needs, such as the counseling, welfare, therapy, and rehabilitation fields.

Table 1 (continued)

11. Leading-Influencing: Interest in leading and influencing of others through activities involving high-level verbal or numerical abilities, such as law, education, management, or social research.
 12. Physical Performing: Interest in physical activities that are performed before an audience, such as sports or other areas like at a circus, carnival, theater, or amusement park.
-

of 307 occupational activity items that covered all worker-trait groups in the third edition of the Dictionary of Occupational Titles for representative samples of 525 males and 590 females identified 11 interest factors. The factor structure was readily interpretable and the factors were highly similar for males and females. However, a small group of occupations in entertainment, recreation, and sports could not be allocated to any of the 11 categories, necessitating the addition of a twelfth area, Physical Performing, to complete the USES occupational system.

The median item-same scale correlations for the final interest scales are all in the .50s. Item-scale correlations of this magnitude necessarily result in scales with high internal consistency reliabilities. The Hoyt reliability coefficients, which are lower-bound estimates for the corresponding test-retest reliabilities, range from .84 to .92 for the 12 scales. Finally, the scale intercorrelations are typically in the .30s and .40s, indicating that the USES-II scales are relatively independent of one another.

A statistical investigation of the vocational interests of adult handicapped persons by Brookings and Bolton (1986) replicated most of the USES-II interest categories. Factor analysis of 168 interest items for a sample of 469 applicants for vocational rehabilitation services isolated eight interest dimensions that paralleled USES-II scales. The emergence of the other USES-II scales was precluded by the absence of appropriate items on the research instrument. Recently completed research by Brookings and Bolton (1987) confirmed the 12-scale structure of the USES-II for a large sample of rehabilitation clients with severe handicaps.

The USES-II is the only interest inventory designed to be used with the most thoroughly occupationally validated

multi-aptitude test available (the GATB), and is directly linked with an occupational exploration system that encompasses all jobs in the U.S. economy (the GOE). The technical strengths of the USES-II deserve special mention: (a) The psychometric foundation of the instrument is outstanding, and (b) The excellent normative sample is representative of the non-professional U.S. labor force.

This section of the Manual concludes with seven research-based conclusions about vocational interests that suggest principles and guidelines for interpreting the results of interest inventories in conjunction with the VR planning process (from Bolton, 1985):

1. Interests are extremely stable aspects of individual personality, changing very little in adults over long periods of time.
2. Interests measured before a person enters an occupation are good predictors of whether or not the person will continue in the occupation, i.e., interests are predictive of occupational choices and career decisions.
3. Interests do not appear to be predictive of academic success, of success in vocational training programs, or of success in most occupations, i.e., interests are relatively independent of the abilities and skills that lead to occupational success.
4. Relationships between interests and corresponding ability test scores are close to zero; a high interest score indicates that if a person survives training and enters the occupation he/she is likely to enjoy the work.
5. Interests are more likely to change in younger persons, especially adolescents, e.g., interest in social service (humanitarian) occupations is particularly likely to increase after age 18; however, interests do not appear to be affected by subsequent work experience.
6. Although the empirical evidence indicates that great caution should be exercised in predicting educational or occupational success from interest scores, in situations where ability is marginal, interests may play a disproportionately important role.
7. Interest inventories are nonthreatening; the resulting profile simply summarizes what the person has said about his/her likes and dislikes with respect to a variety of occupationally relevant activities; the interest profile provides a basis for systematic occupational exploration.

The GATB/NATB

The GATB and its nonreading counterpart, the NATB, are multi-part batteries which include paper-and-pencil as well as apparatus board tests (Droege, 1987). Total administration time, which incorporates a practice session prior to each timed test, is approximately 2½ hours for the GATB, with the NATB usually requiring slightly less. Each battery yields scores for nine aptitudes. Definitions of the aptitudes measured by the GATB and the NATB are given in Table 2.

The nine aptitudes were identified in a series of factor analytic studies using a wide variety of occupationally-relevant tests. The final tests selected for inclusion in the GATB possessed both factorial validity and practical validity against various criteria of successful job performance. The NATB was developed to parallel the GATB in aptitudes measured, without requiring any reading by the examinee.

Instructions for administering and scoring the GATB are presented in the GATB Manual, Section I: Administration and Scoring (U.S. Department of Labor, 1982a). Similar information for the NATB is given in the NATB Manual, Section I: Administration, Scoring, and Interpretation (U.S. Department of Labor, 1982b). Authorization and training in the use of the GATB and NATB batteries is available through local Employment Service offices.

The reliability and stability of the GATB/NATB aptitudes is remarkably high. An investigation by Showler and Droege (1969) in which adults were retested with parallel forms of the GATB at seven intervals ranging from 1 day to 3 years demonstrated the constancy of the aptitudes. The retest correlations for the 1 day interval (parallel-form reliabilities) averaged .87 for the nine GATB aptitudes. The mean retest correlations (stability coefficients) for the nine aptitudes at intervals of 6 weeks, 1 year, and 3 years were .85, .81, and .81, respectively (see Table 3).

If these stability coefficients are corrected for attenuation (unreliability), they approach unity, indicating that general aptitudes are highly stable characteristics of adults. There is, however, a small to moderate practice effect due to retesting: cognitive test scores (GVN) improve about 3 points, perceptual test scores (SPQ) improve about 7 points, and psychomotor test scores (KFM) increase about 10 points. (The standard deviation of GATB/NATB scores is 20 points.)

Occupational aptitude batteries like the GATB/NATB are the most valid predictors of job performance currently

Table 2

GATB/NATB Aptitude Scales

- G - General Learning Ability. Ability to "catch on" or understand instructions and underlying principles. The ability to reason and make judgements. Closely related to doing well academically.
- V - Verbal Aptitude. Ability to understand meanings of words and to use them effectively. The ability to comprehend language, to understand relationships between words and to understand meanings of whole sentences and paragraphs.
- N - Numerical Aptitude. Ability to perform arithmetic operations quickly and accurately.
- S - Spatial Aptitude. Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. The ability to recognize the relationships resulting from the movement of objects in space.
- P - Form Perception. Ability to perceive pertinent detail in objects or in pictorial or graphic material. The ability to make visual comparisons and discriminations and to see slight differences in shapes and shadings of figures and dimensions of lines.
- Q - Clerical Perception. Ability to perceive pertinent detail in verbal or tabular material. The ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation. A measure of speed of perception which is required in many industrial jobs even when the job does not have verbal or numerical content.
- K - Motor Coordination. Ability to coordinate eyes and hands and hands or fingers rapidly and accurately in making precise movements with speed. The ability to make a movement response accurately and swiftly.
- F - Finger Dexterity. Ability to move the fingers and manipulate small objects with the fingers, rapidly and accurately.
- M - Manual Dexterity. Ability to move the hands easily and skillfully. The ability to work with the hands in placing and turning motions.
-

Table 3
Reliability/Stability of GATB Aptitudes

<u>Interval</u>	<u>G</u>	<u>V</u>	<u>N</u>	<u>S</u>	<u>P</u>	<u>Q</u>	<u>K</u>	<u>F</u>	<u>M</u>
1 day	.93	.67	.93	.85	.85	.85	.91	.78	.84
2 weeks	.92	.89	.92	.82	.85	.31	.91	.75	.78
6 weeks	.91	.88	.93	.84	.82	.86	.88	.70	.80
13 weeks	.90	.87	.92	.82	.80	.84	.91	.68	.79
26 weeks	.94	.89	.93	.85	.83	.79	.91	.70	.73
1 year	.90	.85	.83	.83	.78	.74	.85	.76	.76
2 years	.85	.87	.87	.79	.74	.77	.85	.69	.72
3 years	.90	.85	.88	.84	.76	.74	.84	.73	.79

available, even surpassing an actual job tryout in predictive accuracy. Hunter and Hunter (1984) analyzed several thousand independently conducted validity studies, including 515 standardized studies using the GATB and found that for entry-level jobs, a weighted combination of cognitive ability (GVN) and psychomotor ability (KFM) with a mean validity of .53, exceeded all other predictors (see Table 4).

The results of additional analyses by Hunter and Hunter (1984) indicate that GATB/NATB aptitudes are valid predictors of job performance in virtually all occupations. The only job characteristic that appears to require consideration in determining the relative importance of multiple aptitudes is the cognitive complexity of job requirements. These differences in aptitude requirements are illustrated in Table 5 by the varying validity coefficients for cognitive ability (GVN), perceptual ability (SPQ), and psychomotor ability (KFM) across nine job families.

The OR

The OR is a computer-generated vocational report that requires as input data raw scores from the USES-II and either the GATB or NATB. Instructions for use of the OR floppy disk are given in Appendix 1. The Report consists of three sections that contain the following information:

Table 4
Mean Validities for Entry-Level Jobs

Predictor	Mean Validity
Ability composite	.53
Job trycut	.44
Biographical inventory	.37
Reference check	.26
Experience	.18
Interview	.14
Training and experience ratings	.13
Academic achievement	.11
Education	.10
Interest	.10
Age	-.01

Table 5
Mean Validities for Nine Job Families

Job Families	<u>Mean Validity</u>			
	GVN	SPQ	KFM	R
Manager	.53	.43	.26	.53
Clerk	.54	.46	.29	.55
Salesperson	.61	.40	.29	.62
Protective worker	.42	.37	.26	.43
Service worker	.48	.20	.27	.49
Trades worker	.46	.43	.34	.50
Industrial worker	.37	.37	.40	.40
Vehicle operator	.28	.31	.44	.46
Sales clerk	.27	.22	.17	.28

Note: R is the multiple correlation for the three aptitudes.

1. Occupational Interest Profile

- a) Presents the examinee's profile of vocational interests in 12 areas with standard scores (M = 50, SD = 10).
- b) Lists the examinee's vocational interests ranked from high to low with brief descriptions.

2. Occupational Aptitude Profile

- a) Presents the examinee's profile of occupational aptitudes in 9 areas with standard scores (M = 100, SD = 20).
- b) Lists the examinee's occupational aptitudes ranked from high to low with brief descriptions.

3. Occupational Aptitude Patterns

- a) Lists occupational groups for which the examinee possesses SUITABLE aptitudes for success, with page references to the Guide for Occupational Exploration (2nd edition, 1984).
- b) Lists occupational groups for which the examinee possesses MINIMAL aptitudes for success.
- c) For examinee who do not qualify for any work groups at the suitable or minimal level, a subset of occupational groups with SPECIAL CRITERIA may be listed.

USES-II interest scores are presented in the OR on a scale with mean of 50 and standard deviation of 10 in the normative population. Percentile ranks, which give an indication of the relative frequency of occurrence, corresponding to standard scores on the (50/10) scale are listed below.

<u>USES-II Interest Scores</u>										
25	30	35	40	45	50	55	60	65	70	75
1	2	7	16	31	50	69	84	93	98	99
<u>Percentile Equivalents</u>										

GATB/NATB aptitude scores are reported on a scale with mean of 100 and standard deviation (SD) of 20 in the normative population, which was assembled to be proportionally representative of the full range of occupations in the U.S. labor force. Percentile ranks corresponding to standard scores on the (100/20) scale are listed below.

<u>GATB/NATB Aptitude Scores</u>										
50	60	70	80	90	100	110	120	130	140	150
1	2	7	16	31	50	69	84	93	98	99
<u>Percentile Equivalents</u>										

An Occupational Aptitude Pattern (OAP) consists of cutting scores for the 3 or 4 most salient GATB/NATB aptitudes for a homogeneous group of occupations. There exist valid OAPs for 66 work groups, which are groups of occupations having similar aptitude requirements.

Based on a comparison of the examinee's aptitude profile with each OAP, the examinee is determined to:

Possess SUITABLE aptitudes for success

OR

Possess MINIMAL aptitudes for success

OR

Not possess sufficient aptitude for success.

Possession of SUITABLE aptitudes for success means that the individual's scores equal or exceed those of workers judged to be satisfactory in the occupations. If also qualified on the basis of factors other than aptitudes, there is a good probability that he or she will do well on the job.

Possession of MINIMAL aptitudes for success means that the individual's scores are close to those of workers judged to be satisfactory in the occupations, but the chances of doing well on the job are somewhat lower.

Not possessing sufficient aptitude for success means that the individual's scores are similar to or below those of workers found to be unsatisfactory in the occupation. The probability of being satisfactory on the job is low, and the person should be considered for other jobs which utilize his or her stronger aptitudes.

The result of the comparisons of the examinee's aptitude profile with the OAPs for the 66 work groups is that the work groups are allocated to 3 classes:

1. Those for which the examinee possesses suitable aptitudes, which are called Primary Work Groups,
2. Those for which the examinee possesses minimal aptitudes, which are labelled Secondary Work Groups, and
3. Those for which the examinee is unqualified.

The OR lists the Primary Work Groups and the Secondary Work Groups, separately, using a standard format for each work group that includes:

Work group number
Work group title
Representative occupations
Interest score
Page reference to the GOE (2nd ed.)

The work groups are ranked according to the examinee's interest scores, within the separate listings for Primary Work Groups and Secondary Work Groups. All 66 work groups that the OR may generate for an examinee are listed in Appendix 2. It should be noted that the two work groups in Interest Area 12 (Physical Performing) are not included because OAPs are not available for them.

For examinees who do not possess sufficient aptitude to qualify for any of the 66 work groups at either the suitable or minimal levels of success, a supplementary procedure is initiated.

The examinee's GATB/NATB profile is compared to lowered aptitude requirements (i.e., two standard errors below the aptitudes of satisfactory workers) for four specially selected subgroups of occupations.

If the examinee appears to be well-suited on the basis of work habits and essential skills, he or she may have employment potential for the work subgroups identified.

The OR lists the Supplementary Work Subgroups using a standard format for each work subgroup that includes:

Work subgroup number
Work subgroup title
Interest score
Page reference to the GOE (2nd ed.)

The work subgroups are ranked according to the examinee's interest scores. All 36 work subgroups that the OR may generate for an examinee are listed in Appendix 3.

Interpretation

The interpretive framework for the OR is established by the "Counselor Assessment/Occupational Exploration System," which encompasses the USES-II, GATB or NATB, and the Guide for Occupational Exploration (GOE; Harrington & O'Shea, 1984).

In general, OR interpretation involves three steps:

1. Identification of the client's major areas of occupational interest,
2. Identification of work groups within the identified interest areas for which the client possesses requisite abilities, and
3. Exploration of the occupations that the client is interested in and possesses essential aptitudes for successful adjustment.

The OR takes the VR counselor to the third step, which is where the GOE is used. Occupational data in the GOE are organized into 12 interest areas, 66 work groups, and 348 work subgroups.

Employment counseling cannot be effective if it is limited to information about the client. Information is necessary about the world of work, to which the knowledge acquired about the individual can be related in arriving at a suitable occupational choice.

The GOE provides data about thousands of occupations, grouped by interests and by traits required for successful performance. Thus, the GOE provides a convenient crossover from information about the client to potentially suitable fields of work.

After occupationally significant information is obtained about the client through the CR, as well as other sources, the VR counselor and client can use the GOE to explore fields of work and to help select a suitable occupational goal, as a basis for preparing a vocational plan.

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Appendix 1: Instructions for the OR Floppy Disk

1. The following steps need to be completed before using the OR disk for the first time:
 - a. Place the DOS disk for your machine in drive A and follow the standard procedures described in your operations manual to reach the A> prompt.
 - b. Place the OR disk in drive B.
 - c. Enter the following commands: COPY PRINT.COM B:
COPY COMMAND.COM B:
2. To activate the OR:
 - a. Place the OR disk in drive A.
 - b. Place either a blank disk or one with available space in drive B. Client reports will be written to this disk.
 - c. Type REPORT and press the ENTER key to reach the initial input screen and follow the instructions on the screen.
 - d. On the final screen, enter the name of the file to write the report to. This will usually be the client's name or identification number, and should be eight characters or less with no embedded spaces. The report will be written to the disk in drive B, from which it can be printed immediately or stored for future use.
3. To print a client's OR:
 - a. Leave the OR disk in drive A and the disk with the client's report in drive B.
 - b. Type the following command: PRINT B:filename
where filename is the name of the file you wish to print.
 - c. If a message appears on the screen asking for the name of list device, press the ENTER or RET key.
 - d. Printing of the OR will begin in a few seconds.

The Occupational Report was developed by Brian Bolton, Winifred Shaffer, and Paul M. Kuroda, all of the Arkansas Research and Training Center in Vocational Rehabilitation, University of Arkansas, Fayetteville, with the assistance of Ken Schriener, Computing Services, University of Arkansas, Fayetteville.

Appendix 2: Work Groups in the OR

Work Group No. 01.01

Work Group Title: Literary Arts

Representative Occupations: Copy Writer; Playwright;
Writer-Prose, Fiction, Non-fiction; Editor-Book,
Publications, Film; Biographer; Critic

Interest Score: Artistic

See GOE page 81 for details

Work Group No. 01.02

Work Group Title: Visual Arts

Representative Occupations: Painter; Sculptor; Illustrator;
Designer, Fashion Artist; Still Photographer; Art
Appraiser; Art Director; Audiovisual Production Specialist

Interest Score: Artistic

See GOE page 84 for details

Work Group No. 01.03

Work Group Title: Performing Arts: Drama

Representative Occupations: Actor; Narrator; Announcer;
Stage Director; Drama Coach; Producer

Interest Score: Artistic

See GOE page 90 for details

Work Group No. 01.04

Work Group Title: Performing Arts: Music

Representative Occupations: Singer, Musician; Conductor;
Music Teacher; Arranger; Composer; Copyist

Interest Score: Artistic

See GOE page 94 for details

Work Group No. 01.05

Work Group Title: Performing Arts: Dance

Representative Occupations: Dancer, Choreographer, Dance
Instructor; Dance Studio Manager

Interest Score: Artistic

See GOE page 97 for details

Work Group No. 01.06

Work Group Title: Craft Arts

Representative Occupations: Hand Engraver; Etcher; Hand
Carver; Taxidermist; Decorator; Instructor--Decorating,
Painting

Interest Score: Artistic

See GOE page 100 for details

Work Group No. 02.01

Work Group Title: Physical Sciences

Representative Occupations: Astronomer; Chemist; Geographer;
Mathematician; Physicist; Geologist; Environmental Analyst

Interest Score: Scientific

See GOE page 114 for details

Work Group No. 02.02
Work Group Title: Life Sciences
Representative Occupations: Pathologist, Veterinary
Specialization; Botanist; Soil Conservationist; Biologist;
Food Technologist
Interest Score: Scientific
See GOE page 118 for details

Work Group No. 02.03
Work Group Title: Medical Sciences
Representative Occupations: Physician; Surgeon; Intern;
Radiologist; Psychiatrist; Dentist; Veterinarian;
Chiropractor; Speech Pathologist
Interest Score: Scientific
See GOE page 122 for details

Work Group No. 02.04
Work Group Title: Laboratory Technology
Representative Occupations: Laboratory Technician; Assayer;
Embalmer; Weather Observer; Medical Technologist; Tester
Interest Score: Scientific
See GOE page 127 for details

Work Group No. 03.01
Work Group Title: Managerial Work: Plants and Animals
Representative Occupations: Animal Breeder; Farmer;
Landscape Gardener; Tree Surgeon; Forester Aide
Interest Score: Plants and Animals
See GOE page 134 for details

Work Group No. 03.03
Work Group Title: Animal Training and Service
Representative Occupations: Animal Trainer; Animal Ride
Manager
Interest Score: Plants and Animals
See GOE page 141 for details

Work Group No. 03.03
Work Group Title: Animal Training and Service
Representative Occupations: Animal Caretaker; Animal Ride
Attendant; Stable Attendant; Horseshoer
Interest Score: Plants and Animals
See GOE page 141 for details

Work Group No. 03.04
Work Group Title: Elemental Work: Plants and Animals
Representative Occupations: Farmworker; Packer; Laborer;
Poultry Tender; Logger; Forest-Fire Fighter; Fisher;
Trapper; Groundskeeper, Tree Trimmer
Interest Score: Plants and Animals
See GOE page 144 for details

Work Group No. 04.01

Work Group Title: Safety and Law Enforcement

Representative Occupations: Park Superintendent; Deputy Sheriff; Detective; Fire Chief; Police Chief; Fish and Game Warden; Special Agent

Interest Score: Protective

See GOE page 152 for details

Work Group No. 04.02

Work Group Title: Security Services

Representative Occupations: Fire Inspector; Border Guard; Park Ranger; Fire Ranger; House Officer; Police Officer; Fire Fighter

Interest Score: Protective

See GOE page 156 for details

Work Group No. 05.01

Work Group Title: Engineering

Representative Occupations: Engineer--Aeronautical, Chemical, Civil, Electrical, Electronics, Mechanical, Research, Sales, Safety, Industrial, Manufacturing, Production; Architect; Tool Designer; Testing and Quality Control Engineer; Electrical and Electronics Technician

Interest Score: Mechanical

See GOE page 161 for details

Work Group No. 05.02

Work Group Title: Managerial Work, Mechanical

Representative Occupations: Maintenance Supervisor; Superintendent--Construction, Production, Communication; Quality Control Coordinator; Land Surveying Manager

Interest Score: Mechanical

See GOE page 171 for details

Work Group No. 05.03

Work Group Title: Engineering Technology

Representative Occupations: Air-Traffic-Control Specialist; Dispatcher; Drafter--Architectural, Civil, Mechanical, Commercial, Aeronautical; Surveyor--Marine, Mine, Land; Estimator; Building Inspector, Video Operator

Interest Score: Mechanical

See GOE page 176 for details

Work Group No. 05.04

Work Group Title: Air and Water Vehicle Operation

Representative Occupations: Airplane Pilot; Flying Instructor; Test Pilot; Ship Master; Tugboat Captain

Interest Score: Mechanical

See GOE page 185 for details

Work Group No. 05.05

Work Group Title: Craft Technology

Representative Occupations: Brick Layer; Sheet-Metal Worker; Carpenter; Plumber; Painter; Cabinet Maker; Machinist; Electrical-Electronic Installer and Repairer; Printer; Upholsterer; Welder; Mechanic; Tailor, Chief; Dietitian; Optician

Interest Score: Mechanical

See GOE page 188 for details

Work Group No. 05.07

Work Group Title: Quality Control

Representative Occupations: Inspector--Carpenter, Tool, Bridge, Electrical; Automobile Tester; Gas Meter Checker

Interest Score: Mechanical

See GOE page 224 for details

Work Group No. 05.08

Work Group Title: Land and Water Vehicle Operation

Representative Occupations: Truck Driver--Heavy, Light; Locomotive Engineer; Ambulance Driver; Deckhand; Motorboat Operator

Interest Score: Mechanical

See GOE page 228 for details

Work Group No. 05.09

Work Group Title: Material Control

Representative Occupations: Stock Clerk; Material Coordinator; Shipping & Receiving Clerk; Estimator; Recorder; Order Filler

Interest Score: Mechanical

See GOE page 233 for details

Work Group No. 05.09

Work Group Title: Material Control

Representative Occupations: Laboratory Clerk; Mailer; Meter Reader; Marker; Ticketer

Interest Score: Mechanical

See GOE page 233 for details

Work Group No. 05.10

Work Group Title: Crafts

Representative Occupations: Cook; Baker; Electrical Repairer; Painter; Roofer; Television and Radio Repairer; Recording Engineer

Interest Score: Mechanical

See GOE page 240 for details

Work Group No. 05.10

Work Group Title: Crafts

Representative Occupations: Butcher; Appliance Repairer; Offset-Duplicating-Machine Operator; Riveter; Construction Worker; Machine Engraver

Interest Score: Mechanical

See GOE page 240 for details

Work Group No. 05.11

Work Group Title: Equipment Operation

Representative Occupations: Operator--Bulldozer, Dredge,
Derrick, Tractor, Conveyor; Driller; Miner; Stevedore

Interest Score: Mechanical

See GOE page 256 for details

Work Group No. 05.12

Work Group Title: Elemental Work: Mechanical

Representative Occupations: Helper--Painter, Bricklayer,
Welder, Driver, Diver, Cook, Truck Driver, Electrician;
Construction Worker; Excavator; Laundry Worker;
Duplicating Machine Operator; Commercial Cleaner

Interest Score: Mechanical

See GOE page 262 for details

Work Group No. 06.01

Work Group Title: Production Technology

Representative Occupations: Inspector; Taster; Watch
Repairer; Machine Fixer; Machine Setter; Production
Supervisor

Interest Score: Industrial

See GOE page 277 for details

Work Group No. 06.01

Work Group Title: Production Technology

Representative Occupations: Assembler; Calibrator; Machine
Set-up Operator; Molder; Inspector; Bench Hand; Printer

Interest Score: Industrial

See GOE page 277 for details

Work Group No. 06.02

Work Group Title: Production Work

Representative Occupations: Supervisor--Assembly,
Production; Machine Operator--Wood, Paper; Assembler;
Caster; Press Operator; Upholsterer; Weaver; Grinder;
Riveter; Blender; Cutter; Molder; Driller; Trimmer;
Threader; Polisher

Interest Score: Industrial

See GOE page 293 for details

Work Group No. 06.03

Work Group Title: Quality Control

Representative Occupations: Inspector--Garment, Tire,
General, Quality-Control, Building, Paper Products,
Electronics, Electrical, Chemical, Furniture; Tester--
Machine, Weight, Record, Appliance, Electronics; Sorter;
Weigher; Grader; Selector; Marker; Assembler

Interest Score: Industrial

See GOE page 342 for details

Work Group No. 06.04

Work Group Title: Elemental Work: Industrial

Representative Occupations: Assembler; Bench Grinder; Baker; Helper; Dry cleaner; Laundry Operator; Packager; Presser; Production Line Welder; Painter

Interest Score: Industrial

See GOE page 356 for details

Work Group No. 07.01

Work Group Title: Administrative Detail

Representative Occupations: Interviewer; Office Manager; Teacher Aide; Secretary; Insurance Clerk; Test Administrator

Interest Score: Business Detail

See GOE page 444 for details

Work Group No. 07.02

Work Group Title: Mathematical Detail

Representative Occupations: Bookkeeper; Auditor; Account Analyst; Timekeeper; Accounting Clerk; Calculating-Machine Operator; Statistical Clerk; Timekeeper

Interest Score: Business Detail

See GOE page 449 for details

Work Group No. 07.03

Work Group Title: Financial Detail

Representative Occupations: Cashier; Checker; Ticket Agent; Collector; Teller

Interest Score: Business Detail

See GOE page 454 for details

Work Group No. 07.04

Work Group Title: Oral Communications

Representative Occupations: Correspondence Clerk; Customer Service Representative; Dispatcher; Hotel Clerk; Receptionist; Telephone Operator; Reservation Agent

Interest Score: Business Detail

See GOE page 457 for details

Work Group No. 07.05

Work Group Title: Records Processing

Representative Occupations: Reservation Clerk; Travel Guide; Personnel Clerk; Claims Clerk; Proofreader; Stenographer; Mail Clerk; Stenotype Operator

Interest Score: Business Detail

See GOE page 463 for details

Work Group No. 07.06

Work Group Title: Clerical Machine Operator

Representative Occupations: Computer Operator; Billing Machine Operator; Adding Machine Operator; Typist; Key punch Operator; Floor Checker; Check Writer

Interest Score: Business Detail

See GOE page 470 for details

Work Group No. 07.07
Work Group Title: Clerical Handling
Representative Occupations: File Clerk; Checker; Addresser;
Distribution Clerk; Collator; Office Helper; General Clerk
Interest Score: Business Detail
See GOE page 474 for details

Work Group No. 08.01
Work Group Title: Sales Technology
Representative Occupations: Technical Sales; Intangible
Sales; Sales Representative; Traffic Agent; Buyer; Service
Representative; Pawnbroker; Pharmaceutical Dealer
Interest Score: Selling
See GOE page 478 for details

Work Group No. 08.02
Work Group Title: General Sales
Representative Occupations: Manufacturer Representative;
Wholesale Sales Representative; Salesperson--Retail; Real
Estate Sales Agent; Travel Agent; Sales Route Driver;
Telephone Solicitor; Auctioneer
Interest Score: Selling
See GOE page 482 for details

Work Group No. 08.03
Work Group Title: Vending
Representative Occupations: Peddler; Lounge-Car Attendant;
Vendor; Photographer--Amusement, Recreation
Interest Score: Selling
See GOE page 489 for details

Work Group No. 09.01
Work Group Title: Hospitality Services
Representative Occupations: Host/Hostess; Recreation Leader;
Waitress; Steward/Stewardess; Camp Counselor
Interest Score: Accommodating
See GOE page 492 for details

Work Group No. 09.02
Work Group Title: Barber and Beauty Services
Representative Occupations: Barber, Cosmetologist; Hair
Stylist
Interest Score: Accommodating
See GOE page 496 for details

Work Group No. 09.03
Work Group Title: Passenger Services
Representative Occupations: Bus Driver; Chauffeur; Taxi
Driver; Driving Instructor
Interest Score: Accommodating
See GOE page 49 for details

Work Group No. 09.05

Work Group Title: Attendant Services

Representative Occupations: Cafeteria Attendant; Room-Service Clerk; Bellhop; Caddie; Manicurist; Elevator Operator; Usher

Interest Score: Accommodating

See GOE page 504 for details

Work Group No. 10.01

Work Group Title: Social Services

Representative Occupations: Clergy Member; Counselor; Caseworker; Psychologist; Social Worker; Parole Officer

Interest Score: Humanitarian

See GOE page 509 for details

Work Group No. 10.02

Work Group Title: Nursing, Therapy, and Specialized Teaching Services

Representative Occupations: Nurse, Physician Assistant; Athletic Trainer; Dental Hygienist; Physical Therapist; Teacher, Handicapped Students; Kindergarten Teacher

Interest Score: Humanitarian

See GOE page 513 for details

Work Group No. 10.03

Work Group Title: Child and Adult Care

Representative Occupations: Dental Assistant; Electrocardiograph Technician; Nurse Aide; Orderly; Psychiatric Aide; Surgical Technician; Child Monitor; Ambulance Attendant

Interest Score: Humanitarian

See GOE page 519 for details

Work Group No. 11.01

Work Group Title: Mathematics and Statistics

Representative Occupations: Actuary, Financial Analyst; Business Programmer; Mathematical Technician; Forms Analyst; Applied Statistician

Interest Score: Leading-Influencing

See GOE page 524 for details

Work Group No. 11.02

Work Group Title: Educational and Library Services

Representative Occupations: Faculty Member--College, University; Teacher--Elementary, Secondary, Adult Education; Instructor; Home Economist; Librarian

Interest Score: Leading-Influencing

See GOE page 527 for details

Work Group No. 11.02

Work Group Title: Educational and Library Services

Representative Occupations: Teacher Aide; Homemaker; Bibliographer; Career-Guidance Technician; Music Librarian; Classifier

Interest Score: Leading-Influencing

See GOE page 527 for details

Work Group No. 11.03
Work Group Title: Social Research
Representative Occupations: Psychologist; Psychometrist;
Political Scientist; Sociologist; Archeologist;
Anthropologist; Historian; Economist; Occupational Analyst
Interest Score: Leading-Influencing
See GOE page 532 for details

Work Group No. 11.03
Work Group Title: Social Research
Representative Occupations: Research Assistant; Employment
Interviewer; Job Analyst; City Planning Aide
Interest Score: Leading-Influencing
See GOE page 532 for details

Work Group No. 11.04
Work Group Title: Law
Representative Occupations: Judge; Lawyer, Bar Examiner;
Tax Attorney; Arbitrator; Patent Agent
Interest Score: Leading-Influencing
See GOE page 536 for details

Work Group No. 11.04
Work Group Title: Law
Representative Occupations: Appeals Referee, Legal Investi-
gator; Paralegal Assistant; Conciliator; Abstractor
Interest Score: Leading-Influencing
See GOE page 536 for details

Work Group No. 11.05
Work Group Title: Business Administration
Representative Occupations: Manager--Office, Sales,
Personnel; Director--Program, Service, Operations,
Industrial Relations; Administrative Assistant; Managing
Newspaper Editor; Executive Chef; Purchasing Agent
Interest Score: Leading-Influencing
See GOE page 540 for details

Work Group No. 11.06
Work Group Title: Finance
Representative Occupations: Accountant; Auditor; Manager--
Forms Analysis, Records Analysis, Reports Analysis;
Controller; Appraiser; Underwriter; Market-Research
Analyst; Treasurer
Interest Score: Leading-Influencing
See GOE page 546 for details

Work Group No. 11.07
Work Group Title: Services Administration
Representative Occupations: Administrator--Hospital, Social
Welfare; Community Organization Worker; Educational
Specialist; Curator; Park Naturalist; Director--Institution,
Educational Program; Instructional Materials; Principal;
Registrar--College, University
Interest Score: Leading-Influencing
See GOE page 550 for details

Work Group No. 11.08
Work Group Title: Communications
Representative Occupations: Columnist; Commentator; News
Editor; Reporter; Writer; Director; Interpreter; Translator
Interest Score: Leading-Influencing
See GOE page 554 for details

Work Group No. 11.09
Work Group Title: Promotion
Representative Occupations: Advertising Manager; Promotion
Manager; Fund Raiser; Lobbyist; Public-Relations
Representative
Interest Score: Leading-Influencing
See GOE page 558 for details

Work Group No. 11.10
Work Group Title: Regulations Enforcement
Representative Occupations: Revenue Officers; Inspector--
Safety, Traffic, Immigration, License; Sanitarian
Interest Score: Leading-Influencing
See GOE page 561 for details

Work Group No. 11.11
Work Group Title: Business Management
Representative Occupations: Manager--Hotel, Recreation,
Warehouse, Service Department; Director--Funeral, Camp,
Food-Services; Purser
Interest Score: Leading-Influencing
See GOE page 566 for details

Work Group No. 11.12
Work Group Title: Contracts and Claims
Representative Occupations: General Claims Agent; Claim
Adjuster; Appraiser; Real-Estate Agent; Booking Manager;
Contract Specialist; Construction Contractor
Interest Score: Leading-Influencing
See GOE page 571 for details

Appendix 3: Work Subgroups in the OR

Work Subgroup No. 01.06.02

Work Subgroup Title: Arts and Crafts

Interest Score: Artistic

See GOE page 102 for details

Work Subgroup No. 03.03.02

Work Subgroup Title: Animal Service

Interest Score: Accommodating

See GOE page 143 for details

Work Subgroup No. 03.04.01

Work Subgroup Title: Farming

Interest Score: Plants and Animals

See GOE page 146 for details

Work Subgroup No. 03.04.02

Work Subgroup Title: Forestry and Logging

Interest Score: Plants and Animals

See GOE page 147 for details

Work Subgroup No. 03.04.03

Work Subgroup Title: Hunting and Fishing

Interest Score: Plants and Animals

See GOE page 148 for details

Work Subgroup No. 03.04.04

Work Subgroup Title: Nursery and Groundskeeping

Interest Score: Plants and Animals

See GOE page 148 for details

Work Subgroup No. 05.05.01

Work Subgroup Title: Masonry, Stone, and Brick Work

Interest Score: Mechanical

See GOE page 190 for details

Work Subgroup No. 05.05.04

Work Subgroup Title: Painting, Plastering, and Paperhanging

Interest Score: Mechanical

See GOE page 191 for details

Work Subgroup No. 05.05.08

Work Subgroup Title: Woodworking

Interest Score: Mechanical

See GOE page 194 for details

Work Subgroup No. 05.05.13

Work Subgroup Title: Printing

Interest Score: Mechanical

See GOE page 199 for details

Work Subgroup No. 05.05.15

Work Subgroup Title: Custom Sewing, Tailoring, & Upholstering

Interest Score: Mechanical

See GOE page 200 for details

Work Subgroup No. 05.07.06
Work Subgroup Title: Logging and Lumber
Interest Score: Mechanical
See GOE page 227 for details

Work Subgroup No. 05.08.03
Work Subgroup Title: Services Requiring Driving
Interest Score: Mechanical
See GOE page 231 for details

Work Subgroup No. 05.09.01
Work Subgroup Title: Shipping, Receiving, and Stock Checking
Interest Score: Mechanical
See GOE page 236 for details

Work Subgroup No. 05.09.02
Work Subgroup Title: Estimating, Scheduling, & Record Keeping
Interest Score: Mechanical
See GOE page 237 for details

Work Subgroup No. 05.09.03
Work Subgroup Title: Verifying, Recording, and Marking
Interest Score: Mechanical
See GOE page 238 for details

Work Subgroup No. 05.10.08
Work Subgroup Title: Food Preparation
Interest Score: Mechanical
See GOE page 245 for details

Work Subgroup No. 05.11.04
Work Subgroup Title: Materials Handling
Interest Score: Mechanical
See GOE page 258 for details

Work Subgroup No. 06.01.02
Work Subgroup Title: Machine Set-Up
Interest Score: Industrial
See GOE page 278 for details

Work Subgroup No. 06.01.03
Work Subgroup Title: Machine Set-Up and Operation
Interest Score: Industrial
See GOE page 279 for details

Work Subgroup No. 06.01.04
Work Subgroup Title: Precision Hand Work
Interest Score: Industrial
See GOE page 279 for details

Work Subgroup No. 07.07.01
Work Subgroup Title: Filing
Interest Score: Business Detail
See GOE page 475 for details

Work Subgroup No. 07.07.02
Work Subgroup Title: Sorting and Distribution
Interest Score: Business Detail
See GOE page 475 for details

Work Subgroup No. 07.07.03
Work Subgroup Title: General Clerical Work
Interest Score: Business Detail
See GOE page 475 for details

Work Subgroup No. 08.03.01
Work Subgroup Title: Peddling and Hawking
Interest Score: Selling
See GOE page 490 for details

Work Subgroup No. 08.03.02
Work Subgroup Title: Promoting
Interest Score: Selling
See GOE page 490 for details

Work Subgroup No. 09.03.01
Work Subgroup Title: Group Transportation
Interest Score: Accommodating
See GOE page 499 for details

Work Subgroup No. 09.03.02
Work Subgroup Title: Individual Transportation
Interest Score: Accommodating
See GOE page 500 for details

Work Subgroup No. 09.05.02
Work Subgroup Title: Food Services
Interest Score: Accommodating
See GOE page 505 for details

Work Subgroup No. 09.05.03
Work Subgroup Title: Porterage and Baggage Services
Interest Score: Accommodating
See GOE page 506 for details

Work Subgroup No. 09.05.04
Work Subgroup Title: Doorkeeping Services
Interest Score: Accommodating
See GOE page 506 for details

Work Subgroup No. 09.05.06
Work Subgroup Title: Individualized Services
Interest Score: Accommodating
See GOE page 507 for details

Work Subgroup No. 09.05.07
Work Subgroup Title: General Wardrobe Services
Interest Score: Accommodating
See GOE page 507 for details

Work Subgroup No. 09.05.08
Work Subgroup Title: Accommodating
See GOE page 507 for details

Work Subgroup 09.05.09
Work Subgroup Title: Elevator Services
Interest Score: Accommodating
See GOE page 507 for details

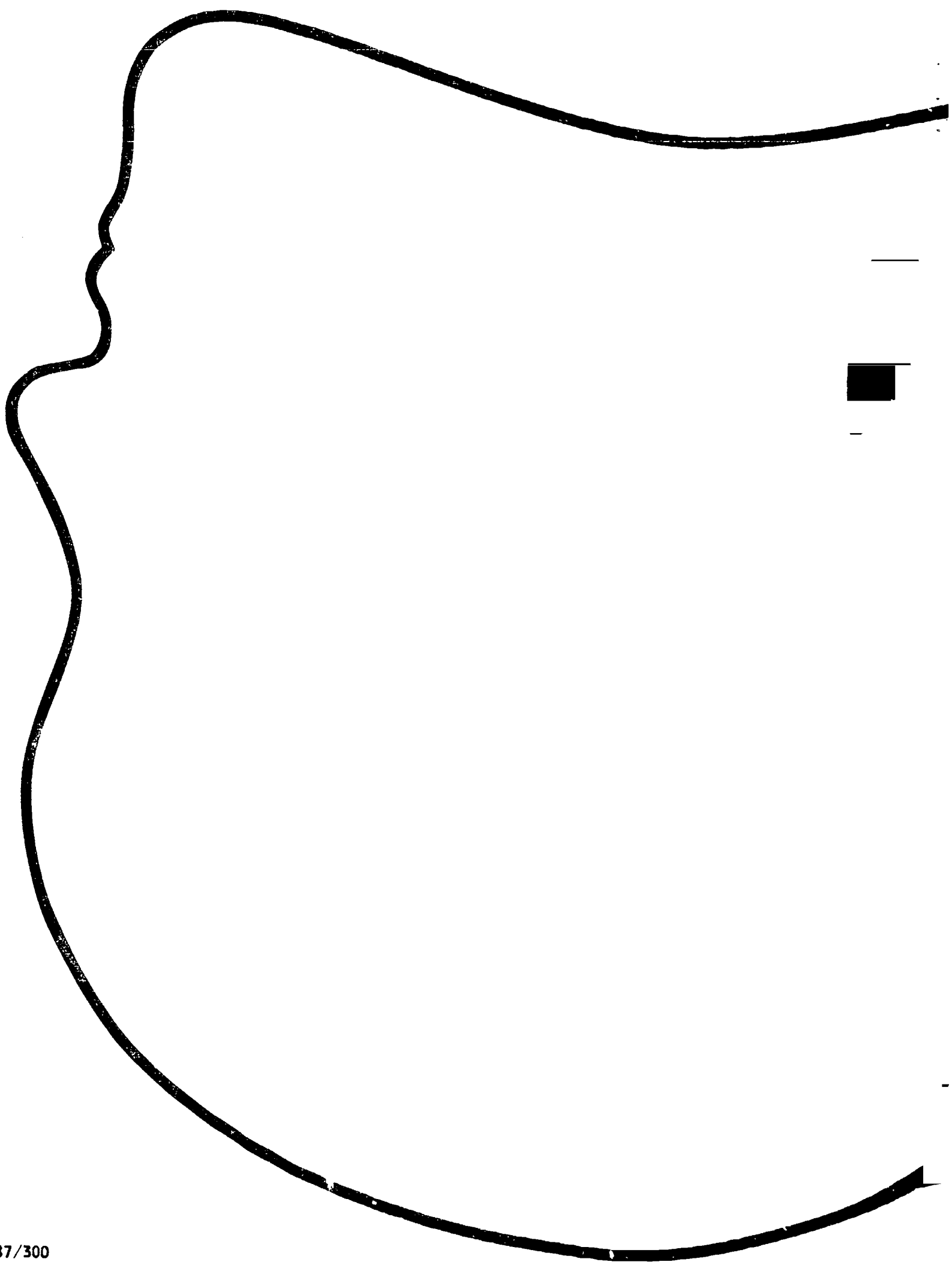
Work Subgroup No. 09.05.10
Work Subgroup Title: Packaging-Wrapping
Interest Score: Accommodating
See GOE page 507 for details

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