This paper (Part II) illustrates input and eventual employment of model "tasks, skills and knowledges" in the front-end job/task analysis subsystem of NEPDIS (Naval Enlisted Professional Development Information System). The four-part matrix displayed in Part I reflects a hierarchy with the task at the top and the associated knowledge elements at the bottom. The task-to-task element-to-component skill-to-component knowledge continuum provides an audit trail for the use of the training program or curriculum developer, whether the matrix is added to the existing master job/task inventory or provided as an ancillary data bank for specialized use.

The principal goal is to set up a functioning audit trail (to justify a body of job-related technical information as actually component to or clearly underlying task performance). A secondary goal is to set up an occupational-field data bank and computerized retrieval methodology to support this aim. The outputs of front-end job/task/skill analysis can then be used both to describe (even construct) jobs/billets and the tasks performed by their incumbents, and to describe the skills and knowledge requirements for job incumbency, certification, advancement, and associated training.
This paper (Part II) illustrates the input and eventual employment of model "tasks, skills and knowledges" in the front-end job/task analysis subsystem of NEPDIS (Naval Enlisted Professional Development Information System). The principal goal is to justify a body of job-related technical information as actually component to or clearly underlying task performance; a secondary goal is to set up an occupational-field data bank and computerized retrieval methodology to support this aim.

The initial input into the model (Figure 1) is a comprehensive inventory of job/task statements consisting of specific actions to be performed on (or with) actual, real-world (not generic) task objects with conditions, standards and supporting descriptive factors. It cannot be over-emphasized that until all the above data as a minimum have been collected, no total and thorough analysis can be completed. The term "front-end analysis" as used in this paper is intended to portray an analysis of all data collected at the front end of any particular occupational data acquisition and analysis project. It is not applicable to any system which collects only a portion of the required data, conducts a portion of the analysis, and then returns to the same (or additional) sources for another round of data collection.

Once the data have been collected, a computerized analysis can sort tasks into skill levels, pay grades, or any other desired distribution based on the inherent complexity of the supporting descriptive factors (Figure 2). This first computer sort produces a crucial product by selecting from the total inventory those tasks most appropriate for assignment to a particular group of job incumbents (Figure 3). The initial list of selected tasks then serves as an input into other computer algorithms which produce lists of billet-specific tasks and a list of rating-specific skills (Figure 4). The skills are then further analyzed to determine knowledge requirements.

The billet-specific tasks can serve useful roles in determination of manpower requirements, assignment of personnel, identification of specific training requirements, advancement in rate, and certification and evaluation of workers' performance on the job. Rating-specific skills serve as the standard to which all members of a rating (regardless of billet to which assigned) must be able to function in order to perform the tasks of a specific pay grade, skill level, or other distribution structure. Knowledge requirements serve to support absolute standards for advancement in rating and for certification in work qualifications.

Once skills and knowledges have been identified and extracted from the tasks, the selection of training sites and methods becomes the area of primary concern (Figure 5). Skills and knowledges can be prioritized for training; and those with highest priority would be assigned to a schoolhouse setting (for instance a class "A" school). The remainder would appropriately be assigned to correspondence courses and other self-study modes. In most cases the training manuals used as the basic text for schoolhouse courses would also be used for follow-on self-study and correspondence courses.

Tasks, like skills and knowledges, can be prioritized for training. Those with high priority would be assigned to schoolhouse settings (for instance, class "C" and class "F" schools), while those of low priority would be assigned to formal on-the-job training.
A total training continuum based on the above assignment to the various training settings would ensure that a worker reporting to a new assignment would have completed training for the skill and knowledge requirements established as necessary to perform in his particular pay grade. It would also ensure that he had been trained to perform tasks peculiar to his particular billet. He would report to his work site already prepared to perform useful work and after a brief period of formal on-the-job training, would be fully billet-qualified and able to perform all tasks assigned his billet.

Job certification and advancement are other areas which would also be served by an automated analysis of occupational data (Figure 6). A task-specific billet description for a worker's next billet and the three elements of training—tasks, skills, and knowledges are the input items for the algorithm. A worker's ability to perform tasks and skills would be evaluated by hands-on performance tests and his possession of adequate knowledge requirements would be evaluated by paper and pencil tests. Once he had demonstrated proficiency in the three elements required for a new billet, he would become eligible for advancement. He could then advance into the new billet and begin functioning as a fully qualified and certified incumbent; upon meeting other requirements such as military leadership, time-in-rate, etc., he could automatically be advanced to the next pay grade commensurate with the billet. The Service as well as the individual would receive fair and equitable compensation.
RATING - AE     PACKAGE - 0001     TASK - 0020     DUTY SUBCATEGORY - 01

TASK STATEMENT - PERFORM MAINTENANCE CHECK ON ROTATING BEACON ASSEMBLY 44126

PLATFORM - P-3 A/B (APBC)
SYSTEM - LIGHTING SYSTEM (44000)
EQUIPMENT - EXTERIOR LIGHTING (44100)
COMPONENT - ROTATING BEACON ASSEMBLY (44126)

COMPLEXITY = 1.67

MAJOR ACTION CATEGORY - MAINTAIN
DUTY SUBCATEGORY (01) - CHECK/TEST/INSPECT
TASK ACTION (PNC) - PERFORM MAINTENANCE CHECK

CUE - REPAIR COMPLETE
STANDARD - IAW REFERENCE PUBLICATION
REFERENCE - NA-01-75PAA-2-12
TOOL - COMMON HAND TOOLS, SPECIAL HAND TOOLS
SUPPORT MATERIAL - FUSE/SWITCH
SUPPORT EQUIPMENT - POWER UNIT 28V 400HZ
TEST EQUIPMENT - RPM GAUGE, AMMETER, MULTIMETER

Figure 1. SAMPLE TASK FROM JOB TASK INVENTORY
RATIONALIZATION OF JT DISTRIBUTION INTO SKILL LEVEL/PAY GRADE GROUPS

<table>
<thead>
<tr>
<th>Complexity</th>
<th>0.21</th>
<th>0.69</th>
<th>0.96</th>
<th>1.23</th>
<th>1.50</th>
<th>1.77</th>
<th>3.95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative Percentages</td>
<td>14%</td>
<td>39%</td>
<td>55%</td>
<td>74%</td>
<td>82%</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

EXIT TRAINEE
ENTER APPRENTICE
EXIT APPRENTICE
ENTER JOURNEYMAN
EXIT JOURNEYMAN
ENTER ADVANCED JOURNEYMAN

Figure 2. TASK DISTRIBUTION HISTOGRAM
DISTRIBUTION OF JOB TASK INVENTORY INTO SKILL LEVEL/PAY GRADE GROUPS

TOTAL JOB TASK INVENTORY → IDENTIFY TASK COMPLEXITY → PLOT DISTRIBUTION BY COMPLEXITY → APPLY STATISTICAL ANALYSIS → SORT TASKS INTO SKILL LEVEL GROUPS → SORT SKILL LEVEL GROUPS INTO PAY GRADE GROUPS

HISTOGRAM OF TASK COMPLEXITY

LIST OF TASKS FOR EACH SKILL LEVEL

LIST OF TASKS FOR EACH PAY GRADE

Figure 3. FLOW CHART OF SKILL LEVEL/PAY GRADE SHRED-OUT
IDENTIFICATION OF BILLET-SPECIFIC TASKS, RATING-SPECIFIC SKILLS AND RATING-SPECIFIC KNOWLEDGE REQUIREMENTS

Figure 4. Flowchart, Identification of Training Requirements
ASSIGNMENT OF TASKS, SKILLS AND KNOWLEDGES TO TRAINING SETTINGS

LIST OF RATHER-SPECIFIC SKILLS

ASSIGN SKILLS TO TRAINING SETTINGS

SCHOOLHOUSE SKILL TRAINING

SCHOOLHOUSE TASK-SPECIFIC TRAINING

ASSIGN TASKS TO TRAINING SETTINGS

LIST OF BULLET-SPECIFIC TASKS

FORMAL ON-THE-JOB TRAINING

NAREC, SELF-STUDY MATERIALS, OTHER

ASSIGN KNOWLEDGES TO TRAINING SETTINGS

Figure 5. FLOWCHART, MATCHING TRAINING REQUIREMENTS WITH TRAINING SETTINGS
Figure 6. Flowchart, Certification and Advancement