Hazardous Material Shipping Computer-Assisted Training Course

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INTRODUCTION

Imagine the ideal training course. The training material is relevant. The instruction is sometimes humorous, but the humor relates to the subject at hand. Rather than teaching countless bits of trivia, the instruction reveals a process that can be used to derive the trivia as needed. Now imagine the ideal instructor. This instructor is extremely patient, and will review material as many times as necessary for each student without boring the other students. The instructor will also determine which subjects a student may have already mastered and will not give unneeded instruction on those subjects. But the instructor will ensure that each student has a satisfactory level of mastery of each required subject.

The Hazardous Material Shipping Computer-Assisted Training Course (HAMSCAT) developed by the Westinghouse Hanford Company (Westinghouse Hanford), under contract to the U.S. Department of Energy (DOE), has all the attributes listed above and more. It is a powerful training tool that can be integrated into existing training programs or become the core of a new program. The course combines an innovative Instructional System Design (ISD) with the flexibility and reliability of a personal computer. Designed to train personnel in the use of the most recent version of Title 49, Code of Federal Regulations, Parts 171-173 (DOT 1987a, 1987b, 1987c), the course teaches the process of using the regulations, rather than trying to teach the regulations themselves.

DESCRIPTION

The HAMSCAT is a computer-based training course. It is designed to run on an IBM PS/2 (a trademark of International Business Machines Corporation, Armonk, New York), or compatible, computer with a hard disk and at least 384K random access memory (RAM) available. The course is graphics intensive, requiring at least a color monitor and color graphics adaptor (CGA) card. The course was programmed using a computer authoring language called PC/PILOT.

The course has two versions: Hazardous Material Shipping (nonradioactive) and Radioactive Material Shipping. Each version may be used standalone or the student may determine which course to study. Once a new student has registered, the choice of versions is made and the student is given a keyboard orientation. Following the orientation, the student is asked to rate their expertise in the applicable area: hazardous material shipping or radioactive material shipping. If the student is an experienced shipper, that individual is immediately tested in the procedure for preparing materials for shipping. The testing areas include gathering required data, selecting acceptable packagings, labeling and marking, placarding vehicles, documentation, and response to problems and emergencies.

In each area, the student is given specific problems and is required to use the most recent version of 49 CFR Parts 171-173 (DOT 1987a, 1987b, 1987c) to solve the problem. For instance, in the labeling area, the student is given a packaged material and is asked to determine the proper labels for the package. If the student is unable to prove mastery of the area, the student is immediately directed to the tutorial for that area. Upon completion of the tutorial, the student is again tested.

In general, the student must solve three consecutive problems before being given credit for mastery of the area. Once all areas have been satisfactorily completed, the student is offered a final examination that requires the student to complete actual offsite shipping documents to be graded by the course instructor. A new or inexperienced shipper is required to satisfactorily complete the tutorial and problem sections for all areas.

INNOVATION

With most off-the-shelf computer-based training programs the course of study offered is generally inflexible at best. The HAMSCAT course has many built-in features that allow the course instructor to modify and configure the program to fit specific needs. An extremely user-friendly Instructor's Program is supplied with the course. This program allows the **instructor** to predetermine a course of study for **each** student. The instructor can make several configuration choices including the following:

- Which version of the course will a student be allowed to access?

- Will a diagnostic examination (pretest) be available?

- Will a comprehensive examination (final) be required?

- Which problems, of the supplied pool, will the student be required to solve?

The Instructor's Program also allows the instructor to input site-specific information that is used in various lessons. For instance, the instructor can input the names and phone numbers of the site shipping experts. One lesson refers to the names and numbers of site experts and encourages the student to contact these people if assistance with a shipping problem is needed.

The problem sets supplied with a course were derived from actual shipments made at the Hanford Site. These problem sets are generic enough to give a student well-rounded experience in using the most recent version of 49 CFR Parts 171-173 (DOT 1987a, 1987b, 1987c). However, each industrial site is unique, and an instructor may want to provide training on shipments unique to that site. Therefore, an instructor can, using most commercially available word processing programs, easily modify existing problem sets or create new problem sets.

IMPLEMENTATION

In general, computer-based training cannot replace an instructor. Too many questions arise that could not have been anticipated. Too many changes happen too fast to be incorporated into courseware. People generally do not trust a computer like they do a human expert, etc. Presently, two possible implementations appear to have promise. The first is to set up a classroom with several computers. The instructor gives an introduction, special cases, shows any videotapes, etc., then starts the students on the computer course. Students leave when finished, some taking only an hour or so, others much longer. In this way, students get the individual attention they need.

The second implementation is to set up a terminal in the workplace near the supervisor. Students working through the course can then interrupt their supervisor with any content questions. Both of these scenarios assume the "course manager" has spent some time learning the detailed operation of the software. In the classroom scenario, the authors anticipate nearly full-time involvement of the instructor.

The flexibility of the course allows the instructor to incorporate it into an existing training program quite easily. For instance, an instructor could give an introduction to an area of study, such as marking packages, then the students could complete the marking packages lesson of the course. If an instructor had a proven comprehensive examination, it might be used in place of the course final. Students might be required to complete the course as a prerequisite to subsequent shipping training.

RECORDS

An American Standard Code for Information Interchange (ASCII) file record is kept for each student. A record is kept for each version of the course; if a student has studied both versions, there will be two records for that student. A record management program is provided with the course. This program allows an instructor to download student files to floppy disk for storage.

A student record review program is also provided. An instructor can access a student's record and monitor the student's progress, as well as success. A student's record can be printed to the screen or to a printer. Both comprehensive and summary reports are available.

Student evaluations of the course are kept. Each student is required to complete an on-line evaluation of the course and the training experience. The instructor can access the evaluations from the instructor's menu. The instructor can use the evaluations to modify the training or recommend changes to the course.

HARDWARE

It is recommended that the course be run on at least an IBM AT (a trademark of International Business Machines Corporation, Armonk, New York) or compatible computer. A faster machine allows shorter delays during file loading routines. However, the course will run on slower machines provided a hard disk, color graphics card, and color monitor are installed.

REFERENCES

DOT 1987a, Hazardous Materials Regulations: General Information. Regulations, and Definitions. Title 49, Code of Federal Regulations, Part 171, U.S. Department of Transportation, Washington, DC

DOT 1987b, Hazardous Materials Tables and Hazardous Materials Communications Regulations, Title 49, Code of Federal Regulations, Part 172, U.S. Department of Transportation, Washington, DC

DOT 1987c, Shipper--General Requirements for Shipments and Packagings. Title 49, Code of Federal Regulations, Part 173, U.S. Department of Transportation, Washington, DC

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