SAE International™

SURFACE VEHICLE RECOMMENDED PRACTICE

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Assessing Technician Training

RATIONALE

The subject of this document no longer falls within the scope of the Service Development Technical Committee and this Committee no longer have any members with expertise to maintain this document.

1. SCOPE

The scope of this SAE Recommended Practice is to guide the service technician and any organization planning training for the technician in selecting and using training programs. The overall objective is to improve the servicing of automotive vehicles by increasing the abilities of service technicians to troubleshoot, diagnose, repair, and service as required.

2. REFERENCES

2.1 Applicable Publications

The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the lastest revision of SAE publications shall apply.

2.1.1 SAE Publication

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE Paper #880393 Assessing Technician Training in the 90's, Charles O. Probst, Cybern Systems, Inc.

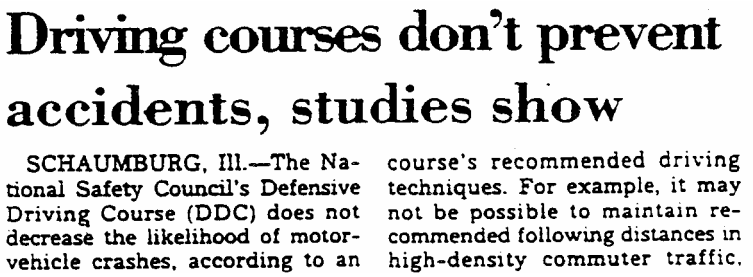
2.1.2 The National Society for Performance and Instruction Publication

Available from The National Society for Performance and Instruction, Washington, D.C. (need entire address, phone and website info.)

Introduction to Performance Technology, Vol. 1, The National Society for Performance and Instruction, Washington, D.C.

3. INTRODUCTION

The bottom line for evaluating training is accountability. "Does it work"? Figure 1.



Driving courses don't prevent accidents, studies show

SCHAUMBURG, Ill.—The National Safety Council's Defensive Driving Course (DDC) does not decrease the likelihood of motor-vehicle crashes, according to an course's recommended driving techniques. For example, it may not be possible to maintain recommended following distances in high-density commuter traffic.

FIGURE 1 - TRAINING THAT DOES NOT WORK
(FROM SAE #880393, ASSESSING TECHNICIAN TRAINING IN THE 90'S)

The basic consideration is output - the results of the training - rather than the input, the content, or the course length. Training is considered in the broadest terms of improving human performance to include more than training materials and programs such as lectures, manuals, clinics, and audiovisual materials. It includes Job Guides to assist the technician in on-job performance without requiring extensive training or memorization. It includes group training and self-paced individualized instruction.

It includes consideration of factors involved in job performance:

a. Ability: Can he/she do the job? Have the requisite knowledge and skills?

b. Attitude: Will he/she do the job? Have the incentives?

c. Environment: May he/she do the job? Tools, rules, time, supervision?

The traditional measures of input do not evaluate training: Course-length in hours, days, weeks; lecture time; videotape/disc, film running time. These commonly-used measures do not address the effectiveness of the training program. Such measures are primarily useful in scheduling training time. (If instruction is individualized, expect study times to vary by a nominal 4:1 ratio; that is, the quickest trainee may finish in 1/4 the time required by the slowest learner.)

A course outline may indicate coverage, but not necessarily the learning acquired.

Trainee-evaluation expressed as "how did you like the course?" has little meaning, but see Section 4.

4. USEFUL INDICATORS

In considering the application of a program to the user's needs, one of the first measures to look for is a specification sheet. See Figure 2. This should include:

a. Purpose: What is the overall purpose of this program?

b. Audience: Who is expected to benefit from this program? What are the entry levels, prerequisite courses and experience? Is it designed for self-instruction?

c. Objectives: What will the technician be able to do at the completion of the course? These objectives should be expressed in can-do terms. For programs dealing with the background theory and operation: describe, discuss, identify, locate, sketch, distinguish. For programs dealing with service, troubleshooting, repair: test, adjust, remove/replace, check.

d. Medium: What is the audio-visual format? What are the hardware requirements to use the program?

Automotive Service Training Program Specifications

Title: **Motronic S E R V I C I N G** -- compared with L-Jetronic Time: 17 minutes

To order:
Slide/Cassette	**STSC MOT 2**	79 frames
FilmStrip/Cassette	**STFS MOT 2**	123 frames (includes motion)
VHS Video	**STVV MOT 2**	adapted from FilmStrip

Audience: Fuel-injection apprentice/trainees; mechanics/installers; system technicians.
Entry level: engine-performance experience. L-Jet 1, L-Jet 2, MOT 1.

Purpose: Compare Motronic service with basic L-Jetronic.
Objectives: Given vehicle manual, specs, and tools, technician will be able to perform service procedures for Motronic, including those also applicable to L-Jetronic:

1. Check **IGNITION**
   a. Demonstrate safety precautions for high-voltage ignition
   b. Check timing at idle and at mid-rpm
   c. Check timing change with knock input
   d. Check dwell at idle; at mid-rpm
   e. Interpret ignition scope primary-patterns

PAUSE FOR REVIEW & QUESTIONS

FIGURE 2 - TYPICAL TRAINING-PROGRAM SPECIFICATION (PARTIAL)

One of the best guides in considering a program is a set of measured results. This should be an evaluation, preferably conducted by an independent organization, specifying in concrete terms how the training improved the performance of technicians who are counterparts of your audience.

Of the four types of assessment shown in Figure 3, the least meaningful is, "How much?" How many people have utilized this training? That is considered Type D assessment.

Types of Assessment

D. HOW MUCH?

C. HOW WELL?

B. HOW EFFECTIVE?

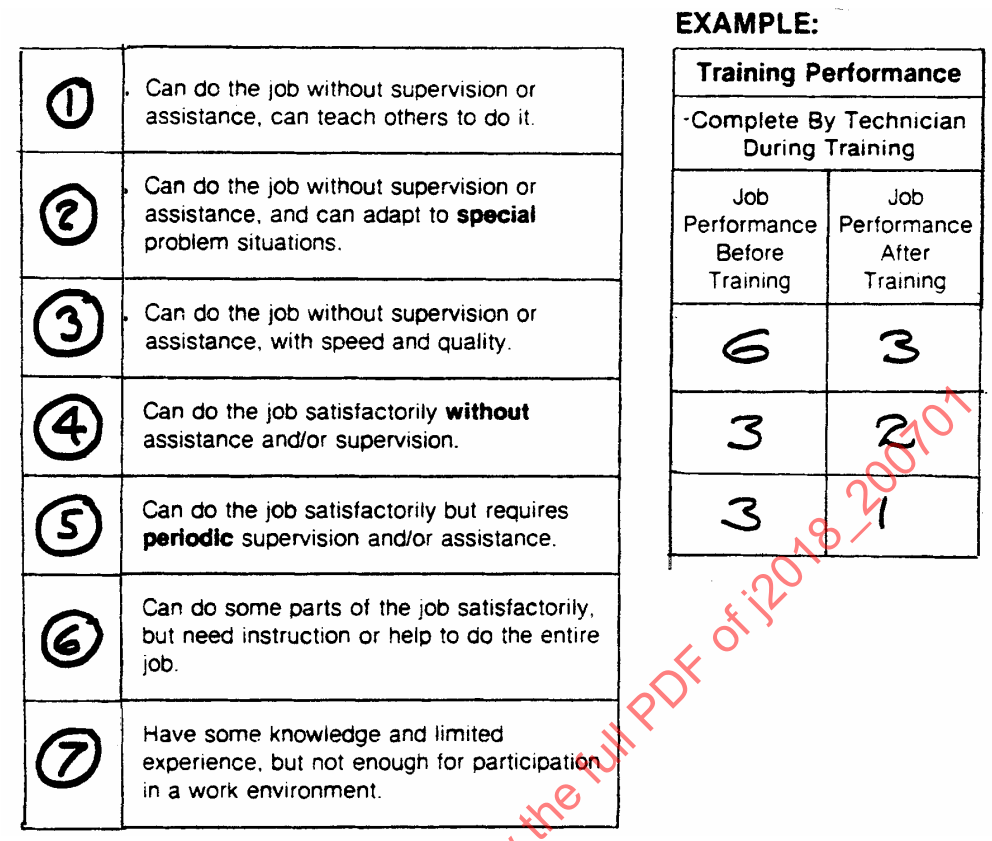
A. HOW AFFECT PROFITS?

FIGURE 3 - TYPES OF ASSESSMENT (FROM SAE #880393)

"How well?" is considered Grade C assessment. This is a measure of how well technicians scored on the criterion test of objectives specified for the course in the specification sheet. In other words, the training organization specified a set of objectives, and then measured how well technicians do in fulfilling those objectives.

"How well?" is a measure of the efficiency of the training. If administered properly, pretest and posttest scores can be meaningful. In other words, how much did the training improve the technicians' ability to meet the objectives?

Type C, "How well?" trainee evaluation can be valuable. See Figure 4. Each trainee evaluates how well the training changed his own ability to meet the objectives of the program specification, both before the training and after completing the training. Such trainee evaluation can be quite specific.



1	Can do the job without supervision or assistance, can teach others to do it.
2	Can do the job without supervision or assistance, and can adapt to **special** problem situations.
3	Can do the job without supervision or assistance, with speed and quality.
4	Can do the job satisfactorily **without** assistance and/or supervision.
5	Can do the job satisfactorily but requires **periodic** supervision and/or assistance.
6	Can do some parts of the job satisfactorily, but need instruction or help to do the entire job.
7	Have some knowledge and limited experience, but not enough for participation in a work environment.

EXAMPLE:

Training Performance	
-Complete By Technician During Training	
Job Performance Before Training	Job Performance After Training
6	3
3	2
3	1

FIGURE 4 - TYPICAL TRAINEE EVALUATION CRITERIA (MODIFIED FROM SAE #880393)

"How effective?" is considered Grade B assessment. How much does the training change things in the shop? How do technicians change the way they do their jobs? How much does training improve the measures of reducing comebacks, improving customer satisfaction, beating the book time with successful repair. "How effective?" is a measure of the effectiveness of the training in a systems approach to the specific objectives of the user.

"How does training affect profits?" is considered Grade A assessment. When the user-feedback system associates specific measures of overall cost improvement with specific training, that is the most valuable measure of assessing training: How does training affect profits, business goals, growth? Example: "As a result of this training, service department sales increased 55%."

5. ASSESSING NEEDS FOR CHANGE

For Type B people measuring "How Effective?", "What can training do for us?", the systems-approach is the engineering approach to assessing training needs. "If you don't know where you are going, how will you know when you get there?" "Are we doing things right?" "Are we doing the right things?" Ask the following questions when you are assessing application of existing training to your problems or challenges.

a. What is the problem, the shortcoming? What is the difference between how they should do the job, and how they are doing it now?

b. Classify the shortcoming of your technicians. What is lacking?

- Knowledge: They don't know how.
- Skills: They can explain the job, but they can't do it with their hands; they can't identify a problem by hearing the sound of a rubbing turborotor. They don't know the smell of burned automatic-transmission fluid.
- Attitude: They know how, they can do it, but they don't want to.