FEDERAL PERSPECTIVE ON CERTIFICATION OF TESTING LABS

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INTRODUCTION

There are some very good reasons for interest in this subject. First, there is the increased emphasis of highway agencies on quality assurance; and second, there is the desire to interface with the international standards and procedures for increased safety and trade. Consequently, because of these pressures, the US procedures for determining acceptance will likely become more formalized and detailed, which may necessitate a revision of *NCHRP Report 350*.

Let me discuss this starting with the general then going to the specific.

WHAT ARE THE ISSUES?

Testing is a technical process which uses a specified procedure to measure one or more characteristics of a product. The *accreditation* of test laboratories and certification or inspection bodies formally recognizes their competence by a *process of expert technical assessment* against agreed criteria. This involves regular surveillance and periodic assessment. *Certification* is a statement by an impartial body that a product, process, or service conforms with a specified standard or similar document. Certification bodies certify either companies' *quality systems* or their *products*. This generally involves assessment and regular surveillance and often draws on the results of testing and inspection. The parallel activity of *calibration* is concerned with correlating the readings (of instruments, etc.) with a standard.

The federal perspective is simply to discern what is in the public interest. Let me continue to place the issue in perspective.

Laboratory accreditation is part of a conformity assessment system. This system includes development of standards (procedures) which define what the purchaser wants and what the supplier agrees to provide; quality systems and laboratory accreditation. The advantage of this is that laboratory accreditation increases user confidence in the validity of the data produced by the laboratory. When properly conducted, a laboratory accreditation program can increase efficiency, expand opportunities for international trade, conserve resources, and improve safety. It also provides a way to deal with the different levels of development in national quality infrastructures. It must also be recognized that, improperly conducted, laboratory accreditation can suppress free and fair competition, impede innovation and technical progress, exclude safer and less expensive products, or otherwise adversely affect trade or commerce. It is important that any system not impose additional burden or changes that add little value.

The official Federal position as expressed by the Office of the United States Trade Representative is, "Laboratory accreditation is an important form of conformity assessment in the United States. While the United States has many programs for the accreditation of laboratories, most of these are specific and narrow in scope, addressing the limited needs of the implementing agency. A few programs, both governmental and non-governmental, are general in scope and capable of addressing the needs of those parties that wish to have laboratories recognized for their technical competence, but do not wish to administer the accreditation programs themselves. The general guidelines for accreditation typically follow the applicable international guidelines, in particular ISO/IEC guides 25, 38, 54, and 55. These guidelines set forth requirements for assessors and their training, for on-site evaluations and factors to be considered, and all the requirements that laboratories must meet to be judged technically competent." *(1)*

For roadside safety features, the issue of accreditation of crash test laboratories from the federal perspective diverges into two almost opposite issues: (1) assuring and improving the competence of existing laboratories, and (2) assuring that a one-time-only test laboratory meets standards.

ACCREDITATION OF EXISTING PERMANENT LABORATORIES

In developing and implementing an accreditation program for crash tests we have the following concerns:

1. Providing assurance of quality, uniformity for critical systems such as crash cushions which often have occupant risk values near the maximum limits;
2. Ensuring fairness for appurtenance developers "A level playing field";
3. Ensuring fairness for individual testing labs;
4. Ensuring fairness to the State Highway Agencies (the customers); and
5. Being of reasonable cost to implement.

TABLE 1 ASSESSMENT CRITERIA AND PROCEDURES REQUIRED BY THE FEDERAL GOVERNMENT

Requirement	Number of Programs with Requirement		
	YES	NO	N/A
Submission of Appropriate Documentation	28	3	
Independence (No Conflict-of-Interest)	9	2	1
Financial Stability	7	23	
On-Site Inspection	26	5	
Staff Qualifications Requirements	26	5	
Adequate Q.A. System	23	8	
Sample Control/Integrity Requirements	21	10	
Recordkeeping Requirements	26	5	
Test Report Content/Format Requirements	24	7	
Available Operational Manuals/Instructions	21	10	
Periodic Random Re-audit of Facilities	13	18	
Periodic Scheduled Re-audit of Facilities	17	14	
Participation in Proficiency Testing Program	18	13	
Adequacy of Facilities & Equipment	28	3	
Equipment Maintenance/Calibration Requirements	25	6	
Other	6	25	

The FHWA would envision such a system to be based on existing guidance such as ASTM E548, "Practice for Preparation of Criteria for Use in the Evaluation of Testing and Inspection Bodies," or ANSI version of the ISO 9000 standards *(2)*, or the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program.

Table 1 from the National Institute of Standards and Technology, summarizes the number and types of assessment criteria and procedures required by the federal government laboratory accreditation type programs identified in the "Directory of Federal Government laboratory Accreditation/Designation Programs" *(3, 4)*.

All or most programs have equipment, facility, personnel, initial on-site inspection, and recordkeeping requirements. There are, however, considerable differences in requirements for laboratory independence from any direct control by the manufacturer/producer/user, the financial stability of the laboratory, for participation in a proficiency testing program and for re-audit requirements.

None of the assessment criteria above seem too difficult to meet if care is taken to have reasonable requirements. There is also a program for a fee by the National Institute of Standards and Technology that would operate an accreditation program.

The Design Concepts Research Division of FHWA is taking the lead in laboratory accreditation. It has made some initial efforts by funding a contract for prequalification of crash test labs that provides for calibration of the electronics. It is also willing to provide software that will encompass the signaling rates, band widths of the different labs. We are also

considering cooperation with the European Community in the calibration of data acquisition systems.

FHWA is considering implementing software to evaluate both electronics and ability to use the standard waveform to accurately compute occupant risk values. The NHTSA, in its use of the generator and software, found significant variations in its crash testing facilities. The NHTSA found up to 20% variations in HIC's, 10 msec time shifts. Only six facilities passed sampling requirements.

PROBLEM WITH DEVELOPER OWNED AND OPERATED "BARE BONES" TEST FACILITIES

The genesis is the concern in providing an accurate method to compare the crashworthiness of road hardware to user highway agencies. There is a convergence of factors. First, the inclusion in NCHRP 350 inclusion of test procedures of work zone devices and safety features. Second, the desire for a competitive edge in marketing by developers of new products. Also the American Traffic Safety Service Association and one state highway agency have expressed interest in evaluating all work zone traffic control devices.

The problems are that:

1. Products claim to be crash tested but don't adhere to established test procedure.

2. Product may increase safety but does not adhere to agreed upon crash procedures.

3. The tests are conducted by developer, often using a live driver. Sometimes the developer appears to "fudge" results.

The possible benefits are:

1. Evaluations are substantially cheaper and may be as discerning as more sophisticated testing procedures.

2. Increased ability to develop products that may not have been affordable if fully instrumented test facilities are used.

3. These facilities may provide the public more safety than products that have no testing.

4. These facilities are all the instrumentation necessary if you are mainly interested in the interaction between the device and the vehicle.

   a. Did parts of the device penetrate the windshield?

   b. Did the small car overturn when it impacted the device?

   c. Did it get hung in the undercarriage causing loss of steering control?

I expect our procedures to continue to evolve, especially as we continue to want to harmonize acceptance of roadside safety hardware with the rest of the world.

REFERENCES

1. Troje, Suzanne, United States Trade Representative, *Standard-Making and Regulatory Procedures in the United States*, May 25, 1993.
2. Jenkins, Mary, A look at ISO 9000, ASTM *Standardization News*.
3. US Department of Commerce, *National Institute of Standards and Technology*, NIST Special Publication 808, Directory of Federal Government Laboratory Accreditation/ Designation Programs.
4. US Department of Commerce, *National Institute of Standards and Technology*, NIST, 15 CFR Parts 7 and 285.