Technician Certification: *A Program in Action*

D.L. Buttrick, G.W. Steele, and F.T. Higgins, Jr.

With the beginning of the Interstate Highway System, the nation's road building effort was greatly increased. Attention was focused on certain deficiencies in the classic specifications and procedures of that era. Each state highway department was faced with the need to begin an ordered restructuring of its current system. The program directors quickly foresaw that the old methods of operation would not be satisfactory when applied to modern high-volume construction. Potential construction delays would make it uneconomical for the contractor to depend solely on department acceptance tests for process control. Changes would be needed in specification requirements, procedures, and test methods.

At the same time, a great deal of training would be necessary to make sure that adequate personnel would be available to administer a revised program. A comprehensive quality-assurance program was envisioned wherein the contractor or producer would be fully responsible for acceptance sampling and testing to assure that an acceptable product had been produced. Materials and construction parameters needed to be evaluated quickly and accurately, and the producer and user needed to arrive at comparably precise answers from such evaluations.

As part of this overall quality-assurance system, the West Virginia Department of Highways established a program in 1965 for the certification of industry and department personnel in bituminous and portland cement concrete technology. The intent of this program was to conduct a cooperative program of training, study, and examination so that personnel of the producer, contractor, and department would be better able by their increased technical knowledge to assure the level of quality required by the governing specification.

As originally developed, the requirements for certification as a Bituminous Concrete Technician or a Portland Cement Concrete Technician were satisfied by written examination. This examination, an "open-book" type, was divided into four parts: (a) fundamentals, (b) sampling and testing, (c) control and inspection, and (d) mix proportioning and adjustment. Each examination takes approximately 6 h to complete, and passing grades require not less than 70 percent for each part of the examination.

As a supplement to the joint industry-department program, the department decided in 1966 to add Inspection Certification. Certification of inspectors includes highway department personnel only and encompasses the following areas: bituminous concrete, portland cement concrete, aggregates, and maintenance bridge inspectors. The examination of inspectors includes both written and practical examinations. All written examinations are open-book. The practical examinations consist of demonstration of proficiency in performing actual test procedures.

Training has been an essential part of both programs, especially in the early phases. From the beginning, the West Virginia Department of Highways joined with industry in sponsoring workshops, usually of one-week duration, to provide helpful information and instruction for persons preparing to take the examinations. These workshops, conducted with the help of the Asphalt Institute and the Portland Cement Association, were designed as "review" or "refresher" courses for persons with some background in the subjects; they were not intended to provide complete instruction for persons without basic foundation in the subject matter.

In 1973, the program was expanded to include Aggregate Technician and Compaction Technician. These categories required written and practical examination to meet certification requirements.

This joint industry-department technical certification program is an integral part of the state's systems approach to achieving one of several objectives—the inclusion of specifications and procedures with a clear definition of the responsibilities of the contractor and the department. The program has been well-received and the use of qualified technicians by industry is now a specification requirement on all department projects. Since the inception

The authors are affiliated with the West Virginia Department of Highways. Buttrick is Chief of General Services and Director of the Personnel Division; Steele is Chief Engineer-Construction, Maintenance, and Materials; and Higgins is Assistant Director, Materials Control, Soil, and Testing Division. Information presented herein is primarily the result of cooperative developments between the West Virginia Department of Highways and the West Virginia Contracting Industry. The purpose of these developments has been to improve quality assurance of the construction process by the certification of both industry and department personnel. This article reflects the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policy of the West Virginia Department of Highways or the Federal Highway Administration.

of the program, more than 1000 industry and department personnel had been processed for certification by the fall of 1981.

In 1979, the department took another step toward the establishment of its total quality-assurance system by using the resources of the classification system based on the Transportation Engineering Technology series, administered by the Institute for the Certification of Engineering Technicians (ICET). Affiliation with the program opened the field to six highway transportation subfields: construction, design, materials, maintenance, surveying, and traffic operations. In addition, the program has now been expanded to include other specialty areas, e.g., construction materials testing, geotechnical, structural design, and construction.

The ICET and now the National Institute for Certification in Engineering Technologies (NICET) have given national exposure to a group that deserved status and recognition, namely, the engineering technicians. Due to the rapid expansion of technology in the transportation field, there is an ever-increasing need for those involved in transportation-related professions to upgrade their knowledge and abilities continually in order that they may keep abreast of new developments. The NICET program now provides each Engineering Technician with the opportunity to gain recognition of his or her abilities and status through meaningful national certification.

The department's quality-assurance program requires competent industry and agency personnel to accept responsibility for their individual job-related functions and the production of complementary results in relation to both job and examination performance. The training and the recognition of such personnel are essential to assure an adequate supply of qualified technicians, now and in the future.

Through the cooperative efforts of the department and the NICET programs, motivated individuals are given every opportunity for advancement on the basis of demonstrated and valid certification of performance and experience. This provides the employee with a meaningful career development program with enough flexibility to allow for changes in employment status without interrupting upward mobility.

The department realizes that for the program to be used to the fullest, it must receive the total support of management. In keeping with this belief, the department assumes the total cost of the testing, including enrollment and examination fees, as well as transportation and lodging costs, eliminating any barriers that might prevent the employee from participating.

Department employees are responsible for conducting examinations held in five established testing locations. Also, the program is linked to the pay and classification structure, providing positive financial and promotional incentives to those with the ability and desire to succeed.

The following tabulation shows the number of West Virginia Department of Highways personnel who have become certified in transportation engineering technology since the inception of the program.

	Level				
Division	I	II	III	IV	Total
Construction	133	62	56	37	288
Design	11	1	6	7	25
Maintenance	N/A	N/A	6	4	10
Materials	40	4	22	12	78
Surveying	50	3	6	1	60
Traffic operations	3	1	5	5	14
Total	237	71	101	66	475

The department realizes many benefits through its involvement in the NICET program. The program encourages employees to expand their knowledge and abilities, and the use of the program also encourages multifield certification, increasing the availability of employees with interchangeable skills. This enhances the effectiveness of manpower management.

The West Virginia program of training and certification has been well-received and the use of qualified technicians by industry is a specification requirement on all department projects. It is appropriate to note that some contractor and producer organizations may feel that costs associated with the contractor quality-control program is a disadvantage to their organizations. However, the majority of contractor and producer organizations that have contractual relations with the department believes that the advantages far outweigh the disadvantages. It is also encouraging to note that contractors with good quality-control organizations have indicated that an adequate quality-control program properly administered yields a net gain rather than a net loss, i.e., such a program improves potential profits.

Based on the favorable results thus far obtained, a continuing training program with administrative mechanisms for implementation in a manner that will bring practical benefits to real work problems is a mandatory part of any viable quality-assurance system. In West Virginia, the Technician Certification Program has filled this need.