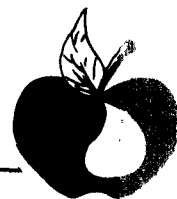




Operator Training Programs



REPORT ON
EPA OPERATOR TRAINING PROGRAMS

for the Agency

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Office of Water
U.S. Environmental Protection Agency
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U.S. Fish and Wildlife Service

EXECUTIVE SUMMARY

During the past 15 years several Federal programs have been initiated to train personnel for the proper operation and maintenance of wastewater treatment plant facilities. This report was developed to provide a broad overview of past and present Federal training programs. The contents of this report provide a review of Federal operator training programs since the late 1960's; the current status of Environmental Protection Agency support for operator training programs; and the current framework for administering a limited Federal support program.

A summary of the facts discussed in this report includes:

1. Planning for operator training programs began in 1967. Initial efforts to develop programs capable of training large numbers of personnel for operating and maintaining Municipal wastewater treatment facilities utilized existing Federal authorities—primarily the Manpower Development and Training Act.
2. During the past 15 years, training needs, funding levels and policy directions shifted. From 1967-1971 Federal agencies focused on developing training programs across the U.S. From 1971-1977 emphasis was placed on operating these training programs. During the period 1977-1980 individual states began to become self-sufficient in the area of operator training. In 1980, and continuing at the present time, the Federal Government is phasing out its role in operator training. As a result, training program emphasis progressed through various phases of training operators; training instructors; developing training materials; providing support to non-governmental organizations involved in operator training activities; and developing State self-sufficiency for operator training.
3. After 15 years of existence, Federal program activities invested approximately \$36.6 million in grant and contract funds for operator training. These funds were used to train between 15,000 and 20,000 persons; develop a variety of curricula and instructional materials; and support a number of other related projects.
4. Section 109 (b), enacted as part of the Federal Water Pollution Control Act Amendments of 1972, authorized the use of construction grant funds for providing operator training facilities within a state. This program was implemented to encourage and promote State self-sufficiency in conducting operator training programs.
5. During the past five years EPA developed programs and institutions which encouraged State self-sufficiency in the area of operator training. Emphasis was placed on supporting related organizations and on-going training programs so they could continue with minimum or no Federal funding.
6. In recent years, increased emphasis was placed on developing high quality training materials for use by trainers to satisfy a variety of needs. This activity was a means to efficiently use limited resources to develop quality materials that did not previously exist.
7. A key factor in promoting State self-sufficiency was support of non-governmental organizations that were important in the field of operator training. Support was given

to States, the Associated Boards of Certification (ABC), the Joint Training Coordinating Committee (JTCC), the National Environmental Trainers Association (NETA), the Instructional Resources Center (IRC), the National Trainers Institute (NTI), the National Demonstration Water Project (NDWP), and the American Clean Water Association (ACWA).

8. The current EPA operator training program is almost entirely dedicated to the support of State operator training programs. The intent of this effort is to utilize operator training resources as a means to help solve noncompliance problems at small municipal wastewater treatment facilities.
9. EPA encourages State (and local) responsibility for providing adequate training programs, which will produce the qualified personnel needed to operate current and future wastewater treatment facilities. The Agency believes that past efforts to establish State self-sufficiency have provided the basis for an accelerated transition of overall training program management and funding responsibility to States.
10. Operator training funds, added by Congress to the Agency's budgets, are being channeled primarily to ongoing State training efforts through State training centers or State agencies.

INTRODUCTION

Federal water pollution control programs have spawned a variety of related training activities throughout the years. The earliest involvement of the Federal Government in a direct training activity was in the mid-1950's, when the U.S. Public Health Service conducted training courses at the Robert A. Taft Sanitary Engineering Center in Cincinnati. The primary objective of these first training activities was to provide technical training for personnel of public agencies and others with suitable qualifications. An expansion of Federal water pollution control programs, following enactment of the Federal Water Pollution Control Act of 1956, stimulated growth in university academic programs throughout the country. This growth in academic programs was based to a large extent on Federal research funds. Most of these programs were directed toward research in the field of water pollution control, and provided opportunities for the training of graduate engineers.

Institutionalized training programs for operators of wastewater treatment facilities were almost nonexistent in these early years. Most of the needed training was accomplished through on-the-job training by existing plant operating staff, and through short-course activities sponsored by operator associations, professional organizations, and State agencies. Although much of this training was very good, there was simply not enough of it to meet the growing demand. Additionally, there was almost a total lack of programs designed for individuals beginning a career in the operations field.

Growing Federal financial support for the construction of wastewater treatment facilities during the 1960's resulted in an increased need for additional and more highly trained operator personnel. Congress took note of this in its water pollution control legislation in 1966, and by the late 1960's programs had been established in the Federal Water Pollution Control Administration (FWPCA) to initiate new manpower development and training activities. Since that time, a variety of programs have been introduced and phased out.

This report has been developed to review the course of Federal manpower development and training programs since the late 1960's, and to provide a current perspective for developing Agency policies and activities. The report addresses only those programs involved with the training of personnel in the operation and maintenance of wastewater treatment facilities. This report is not intended as a comprehensive survey of all past and current operator training programs, but only those supported by Federal funding. Many other programs have been developed and expanded during the past 15 years and draw their support from a variety of other sources. It is believed that this non-EPA support is the real base upon which future programs will be built.

The intent of this report is to:

- 1) provide a basis for understanding EPA's historical and present approach to operator training
- 2) provide an understanding of the current framework for administering the phaseout of the Federal support program
- 3) provide Congress with an understanding of the background for EPA policy on phaseout of Federally assisted training

- 4) provide information to other organizations which are concerned with facilitating State and local training efforts

EPA's operator training program has been in existence for about fifteen years. This report will review the legislative basis and history of the program; the directions, activities, and scope of the program from 1967 to 1982; some of the major factors that influenced the direction of the program; and the current status and accomplishments of all of these efforts. The report is not intended to provide a detailed, in-depth analysis of all of the many activities that took place during this time period, but to identify the major milestones, directions, and operating levels. This overview will thus provide a general understanding of past EPA training activities and present EPA policies.

LEGISLATIVE HISTORY

The basis for the operator training programs that have been conducted by EPA and its predecessor agencies is found in the enabling legislation for the Federal water pollution control program. This part of the report reviews the Federal legislation and identifies those sections that have been utilized for operator training programs. In addition, EPA has used some external programs authorized by other Federal legislation, and these will be identified also.

The first legislative language dealing with training appeared in the Water Pollution Control Act of 1956. Section 4 of this Act authorized grant awards, contracts, research fellowships and *technical training for public agency and other personnel*. Implementation of this section marked the beginning of support for academic research and training activities, and the presentation of direct training courses in Cincinnati.

Recognition of the need for additional manpower, to successfully implement national water pollution control programs, was reflected in The Clean Water Restoration Act of 1966 (PL 89-753). Section 16 of that Act called for a study. This study was to determine the need for additional trained State and local personnel to carry out the programs under the Act, and to determine means to use existing Federal training programs to meet this need. A report was to be made to Congress by July 1, 1967. As a result of Senate deliberations before the passage of this Act, the Senate Committee report (July 11, 1966) raised and discussed the issue of trained operations personnel. More short-term and long-term operator training programs were called for. The committee suggested a report to Congress on the question of skilled manpower needs for operation and maintenance, recommended that a national conference be held, and suggested that the Departments of Labor and Health, Education, and Welfare get more involved in this matter.

The Water Quality Improvement Act of 1970 (PL -91-224) addressed the need for assuring an adequate supply of trained personnel, to implement the national water pollution control effort that was getting underway. The 1970 legislation authorized programs to address manpower planning, development and training needs for all levels and categories of personnel involved in the total span of pollution abatement and control activities. Section 5 (previously Section 4) of the basic Act was retained and expanded to authorize the financing of pilot programs for manpower development and training of persons in the field of operation and maintenance. This authorization established the basic operator training program administered by EPA. (The

section that established this program was redesignated as 104(g)(1) in the 1972 legislation, and has been commonly identified as the “104(g)(1) operator training program”.)

Section 5 of the 1970 Act also directed the development and maintenance of a manpower forecasting system. This system related to all occupations needed for the prevention, control, and abatement of water pollution. Section 5 further requested that a report be submitted to Congress within 18 months concerning the implementation of manpower development and training programs established under Section 5. The 1970 Act further added Sections 16, 17, 18 and 19, which established support programs for undergraduate curriculums in the design, operation, and maintenance of wastewater treatment works.

With enactment of the 1970 Act, a broad legislative base existed for implementing Federally supported training programs. Section 5(g)(1) supported a variety of vocational-type training activities at the operator level, while Sections 16-19 supported the development of undergraduate programs related to plant operations.

The Federal Water Pollution Control Act Amendments of the 1972 (PL 92-500) retained all of the training-related sections of the 1970 Act, but redesignated them. Section 5(g) became Section 104(g), and Sections 16, 17, 18 and 19 became sections 109(a), 110, 111 and 112, respectively. A new section, 109(b), was added which permitted the use of up to \$250,000, of each State's construction grant allocation, to construct a facility for training wastewater treatment facility operators in that State. These were 100% grants and did not require any matching funds.

The Clean Water Act of 1977 (PL 95-217) retained all of the previous training-related sections of the Act. However, it modified Section 109(b), the state training center program, to permit the use of grant funds for other State training program costs such as mobile training units, classroom rentals, specialized instructors and instructional materials. The modifications also increased the amount of construction grant funds that could be used under Section 109(b) from \$250,000 to \$500,000.

There have been no changes in the content of the training related sections of the Federal legislation since 1977. Key milestones of Federal legislation related to training are shown in Table 1.

Two other pieces of Federal legislation also proved to be important in conducting operator training programs. The Manpower Development and Training Act (PL 87-415, as amended) and the Comprehensive Employment and Training Act (PL 93-203) provided training and employment authorities as well as funding. Both were utilized in the early development of operator training programs.

TABLE 1. LEGISLATIVE MILESTONES

1956	Water Pollution Control Act of 1956 (PL 84-660) Section 4 established authority for grants for research and training projects, research fellowships, and training programs.
1966	Clean Water Restoration Act of 1966 (PL 89-753) Section 16 called for a study on manpower and training needs to implement water pollution control programs, with a report to Congress by July 1, 1967.
1970	Water Quality Improvement Act of 1970 (PL 91-224) Section 5 provided authority for pilot programs of manpower development and training of persons in the operation and maintenance of treatment works, established a manpower forecasting system, and requested a report to Congress. Sections 16 through 19 provided for support to institutions of higher education for undergraduate programs in the design, operation, and maintenance of treatment works; and for scholarships for undergraduate training.
1972	Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) Section 109(b) established state training center program, using up to \$250,000 in construction grant funds per State.
1977	Clean Water Act of 1977 (PL 95-217) Section 109(b) modified to expand state training center authorizations.

THE FIRST DECADE—1967 TO 1976

Background

The Clean Water Restoration Act of 1966 (PL 89-753) called for a study to determine the amount of additional manpower needed to implement programs mandated by the Act. This study focused on State and local personnel requirements and the possibility of utilizing existing Federal programs to train needed personnel. Although this study was to address all levels of personnel, special emphasis was given to manpower requirements for operating wastewater treatment facilities.

The Federal Water Pollution Control Administration (FWPCA) reported the study's findings to Congress August 2, 1967. This study determined, relative to manpower and training needs for wastewater treatment personnel:

- a) An additional 30,000 trained operators for municipal treatment facilities would be needed by 1972.
- b) The availability of training activities, through institutional programs and short course offerings, was inadequate to meet the current requirements, and was destined to become worse due to the growing demand for trained operators.
- c) The problems of maintaining an adequate, trained operations workforce are compounded by problems of recruitment, retention and utilization. Typical problems cited include low salaries, a low level of prestige and acceptance in the community, inadequate licensing programs, and poor utilization of automation to reduce manpower needs and skill levels.

The FWPCA concluded its report by identifying an action plan to respond to these major problem areas. Key actions related to operator training programs included the following:

- 1) Initiate training and facilities grants to technical/vocational schools and junior colleges for training operators and developing related training programs.
- 2) Explore and develop interagency agreements to utilize manpower development and training programs managed under other agencies' authorities.
- 3) Development activities to promote the strengthening of State operator licensing programs.

Program Development and Implementation

As a result of this study, an Office of Manpower and Training was established within FWPCA in 1967. This office immediately began to develop new activities based on a broader use of existing Agency legislative authority. It also began to develop interagency agreements to utilize other agencies' manpower development and training authorities. Priority emphasis was placed on developing agreements with the Departments of Labor and Health, Education and Welfare to utilize the broad authority and programs of the Manpower Development and Training Act (MDTA). The objectives of these initial efforts were to:

- 1) Develop and implement training programs for entry level and upgrade training to meet the increasing need for operators during the next five years.
- 2) Develop curriculum guides and materials to support the establishment of new training programs and the training of operations personnel.
- 3) Support the development of institutionalized training programs at technical/vocational schools and community colleges for operations personnel.

New program activities began in earnest during FY 68, especially with the negotiation of interagency agreements and the development of programs to use existing legislative authority (Section 5). An initial interagency agreement was developed that allowed the FWPCA to become a participant in the Cooperative Area Manpower Planning System (CAMPS). This

MDTA program was then used to channel \$1,162,000 in FY 69 into training programs for 980 persons. These training funds were made available through the CAMPS program to State water pollution control agencies in 15 States, Puerto Rico, and the District of Columbia. The CAMPS training was essentially on-the-job training where an instructor was hired to train personnel at wastewater treatment facilities. In FY 69 the Section 5 grant authority was used to award grants totalling \$122,000 for the development of operator training materials and curriculum guides.

In FY 70, the CAMPS training program was continued. The on-the-job training was supplemented by efforts to develop training programs at educational institutions for entry level and upgrade training in the area of plant operations. Institutions involved were primarily technical/vocational schools and community colleges. In FY 70, the State training activities under the CAMPS program trained about 2,900 operators in 25 States at an estimated cost of \$3 million. A Section 5 grant of \$35,000 continued needed curriculum development work.

FY 71 saw the fullest development of the MDTA program capabilities, both in terms of funding level and training activities. This year was also the first year of new agency authorities under the Federal Water Pollution Control Act (PL 91-224), and full use was also made of these capabilities. The MDTA programs included the following:

- 1) Coupled On-the-Job Training—This program offered entry level and upgrade operator training for unemployed and underemployed persons in wastewater treatment plants through combined classroom and on-the-job training activities.
- 2) Institutional Training—This program helped support the establishment of entry level operator training programs at several technical/vocational schools and community colleges around the country. The typical training program included 440 hours classroom instruction and 440 hours of the hands-on training in a treatment plant.
- 3) Public Service Careers (PSC)—This program relied upon several sponsoring agencies to work with treatment facilities to find and develop employment vacancies for the placement of disadvantaged persons. Persons placed in such vacancies were also provided with training and supportive services to assist them in becoming competent employees.
- 4) Transition Training—In this program, agreements were developed between training institutions and military bases to provide entry-level operator training for military personnel who were leaving the service. Basic classroom and on-the-job training were provided, as well as assistance in locating employment opportunities in water pollution control facilities.

These MDTA programs invested a total of about \$4,165,000 during FY 71 in training about 2,800 persons. In addition, the Agency utilized the authority and funding of the Federal Water Pollution Control Act to supplement other on-going training activities. This was the first year of expanded programs under Section 5(g). Under Section 5(g)(1), about \$957,000 in grant funds were used to support instructor training activities, operator training in advanced wastewater treatment, and State sponsored operator training activities. About \$54,000 was used under Section 5(g)(3) for curriculum development in operator training

programs. Approximately \$331,000 was used under Section 16 to establish undergraduate programs related to plant operations, and to train students at seven institutions of higher education. The total of all funds committed during FY 71 for support of training programs, related to the operation of treatment facilities, was about \$5.5 million.

FY 72 saw a decline in the level of funding for MDTA training programs, but all four elements of the effort, as described above, were continued. The Agency's own funding levels and program directions were approximately the same as in the previous year. This was also the last year in which funds were provided for the PSC and Institutional Training programs.

The funding level of the MDTA programs was again reduced in FY 73, and only the OJT and Transition Training programs remained from the original activities. An additional activity was initiated, under the Work Incentive Program (WIN), to provide remedial education and skill training for adult welfare recipients. Agency programs continued at the same funding level.

A significant event during FY 73 was passage of the Federal Water Pollution Control Act Amendments of 1972. This legislation provided \$250,000 per State in wastewater treatment facility construction grant funds. These funds were ear-marked for constructing a facility for treatment plant operator training. These were 100% grants that did not require any matching funds. Efforts began immediately to develop the guidelines and regulations that would allow States to use these grant funds to expand their capabilities to assume the responsibility for comprehensive training programs.

Funding for MDTA programs actually increased slightly in FY 74, but the total program effort and activities were about the same as in the previous year. FY 74 was the last year in which MDTA funds were available to initiate new operator training projects. Although new funding was not available, training under previously negotiated projects, funded in prior years, continued on into FY 75 and FY 76. Agency funded programs continued at a stable level of about \$1.1 million from FY 74 through FY 77.

A summary of funding levels for operator training programs during this ten year period is shown in Figure 1.

Program Overview and Accomplishments

This ten year period was characterized by rapid growth in program activities and funding levels. The program directions and activities were guided by the FWPCA report to Congress in 1967. The early priorities of the program were to provide training for large numbers of persons in order to meet a growing need for certified treatment facility operators. As funding levels decreased and training programs became well established in many parts of the country, the Agency's priorities began to shift. EPA began to focus more support toward programs that would contribute to improvement in the quality, consistency, and timeliness of independent training efforts. Although Federal funds were still being used to provide training to meet acute and special needs, a larger percentage of the available funds were being used to develop training support systems, training curricula and materials, instructor training activities, and to meet training program improvement needs.

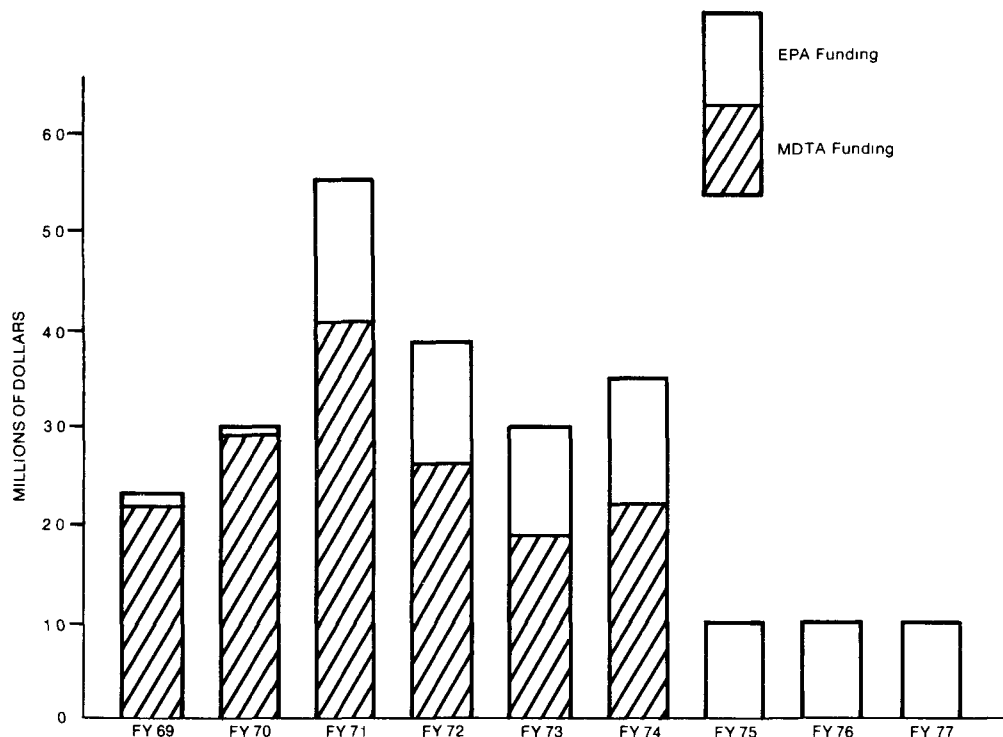


Figure 1. Funding Levels For Operator Training

As an example of this shift in priorities, support was given to initiate activity in three important areas. Supported by EPA grants, the Association of Boards of Certification for Operating Personnel in Water and Wastewater Utilities (ABC) was formed in 1972 and began work to improve operator certification programs in States throughout the country. Support was also given to establish another organization in 1977, the Joint Training Coordination Committee (JTCC), to begin promoting and assisting more effective coordination of operator training activities at the State level. The Instructional Resources Information system, (IRIS), a computerized information storage and retrieval system, was developed in 1975 for the use of trainers and training institutions.

Many significant events occurred during this period related to legislative changes and program activities that affected the course of Federal efforts to support operator training. These events are summarized in Table 2.

From FY 69 through FY 77, approximately \$24.6 million of extramural funds were obligated by the Federal Government. About 64% came from the MDTA program and about 36% from EPA programs. Because of the diversity of training programs, it is difficult to find an accurate record of the number of persons trained. However, the number of persons trained is estimated to be in excess of 13,000. In addition, other significant products resulted from these efforts, many of which are still of importance in the planning and conducting of current operator training programs. Examples of such products can be grouped as follows:

1) Curriculum Guides

- Criteria for Establishment and Maintenance of Two-Year Wastewater Post High School Wastewater Technology Programs (CEWT)
- A Two-Year Water Quality Monitoring Curriculum
- Curriculum Guide—A Four-Year Wastewater Technology Program

2) Instructional Materials

- Sacramento State University correspondence course for plant operations
- Michigan State correspondence course for entry-level managers
- Instructional technology courses
- NPDES effluent monitoring procedures courses
- Standard Operating Job Procedures (SOJP) for process unit operations
- Troubleshooting Operation and Maintenance Problems in Municipal Wastewater Treatment Facilities

3) Institutional Support

- State Training Centers through Section 109(b)
- Association of Boards of Certification for Operating Personnel in Water and Wastewater Utilities
- Joint Training Coordinating Committee
- Instructional Resources Information System
- Several training programs at educational institutions

These training efforts were administered by the FWPCA and then the EPA through a variety of means. The funding from MDTA was transferred to the Agency by means of interagency agreements. Most of these funds were then utilized through means of national contracts negotiated by the headquarters office or through grants awarded directly to sponsoring organizations. Regional office staffs grew significantly during this time period. They played a major role in establishing programs, recruiting students, placing training program graduates and monitoring the performance of the training activities. The Regional Office staffs were particularly active in working, with State training programs and educational institutions, to develop and implement activities supported by the Agency's own training grant authorities and funding.

Early in this same time period, there was also a significant growth in direct training courses presented by the Agency, both at the Robert A. Taft Sanitary Engineering Center in Cincinnati, and in several newly established regional laboratories. The number of courses offered was greatest in the early 1970's, and then began to decline in number as program funding levels decreased. Although many of these courses, particularly those related to the conduct of laboratory analyses, were of value to operators, they were never a significant part of the nation's total operator training effort.

TABLE 2. MILESTONES: 1967 TO 1977

1967	Report to Congress on manpower and training needs
1968	Interagency agreement negotiated to participate in CAMPS program to train operators Section 5 used to start development of curricula materials
1970	Full use made of MDTA program through On-The-Job Training, Institutional Training, Public Service Career Programs, and Transition Training First year for expanded Section 5 program.
1971	Start in decline in MDTA funding
1972	MDTA program cutback to OJT and Transition Training. WIN program added Section 109(b) enacted to support establishment of State Training Centers Associated Boards of Certification (ABC) formed
1974	Last year for MDTA funding
1975	Grant program limited to section 104(g)(1) funding authority Instructional Resources Information System (IRIS) established
1977	Joint Training Coordinating Committee (JTCC) Formed

THE PERIOD 1977-1982

Background

EPA refocused the priorities and direction of operator training programs during the period 1977 to 1982. This redirection was based upon experience gained in conducting the large operator training efforts that began in the late 1960's; knowledge gained from a number of studies conducted in the early 1970's; and a shift in policy regarding the Agency's role in training and assistance activities.

Following the formation of EPA in 1970, there was a gradual change in Agency policy for assisting municipalities to comply with discharge permit requirements. This policy change was reflected in Agency programs related to technical and training assistance for States and municipalities. The Agency's policy was to rely upon the private sector for technical assistance to municipalities, to support the concept of assisting states and educational institutions to achieve self-sufficiency in their operator training programs, and to increase emphasis on Agency and State enforcement of discharge permit requirements. In 1977, amendments to the Clean Water Act recognized primary State responsibility for management of the construction grants program and provided for delegation of essentially all activities, including training, to eligible States.

Other agencies, besides EPA, also began to wind down operator training programs. Funding through the Manpower Development and Training Act (MDTA) was eliminated after FY 74. Funding through the Comprehensive Employment and Training Act (CETA) was also reduced as that program's funding decreased. The initiation of new and continued training activities by EPA then became totally dependent upon funding available through the Section 104(g)(1) authority of the Federal Water Pollution Control Act. As a result, program operating budgets and activity levels declined during this time period.

The shifting of EPA policy resulted in organizational changes to consolidate the program's management. In 1976, two organizational units located in Cincinnati, one responsible for the Agency's water quality direct training function and the other involved with field assistance on plant operational problems, were combined to form the National Training and Operational Technology Center (NTOTC). Beginning in 1977, many of the operator training program responsibilities were shifted to NTOTC from the Washington, D.C. Headquarters Office. In 1979 the total management responsibility for the operator training program was assigned to NTOTC. The Washington training office was reduced to a small liaison staff. Following the continuing Agency policy to reduce EPA's direct involvement in training activities, the NTOTC offices were closed on September 30, 1981.

Program Directions

To support achievement of State self-sufficiency, EPA utilized the experience, materials and activities which were generated during the first ten years of the program. Emphasis was placed on implementing those activities that would result in institutionalizing key elements of on-going training programs, and thereby provide a base of operations and support that could continue with minimal or no Federal funding. The overall impact of this new direction was a decrease in direct training of operations personnel and an increase in the development of State training program support systems.

EPA's program efforts were directed into three main areas: the support of activities to establish and improve State operator training programs; support activities directly operated by NTOTC; and support to other organizations that had direct involvement in or impact on operator training programs. The interrelation of these three areas, and the component parts of each, are illustrated in Figure 2. These areas of activity are described in the following paragraphs.

State Program Support

Support of State operator training programs took place through two primary means. Section 109(b) of the Clean Water Act authorized a State to utilize up to \$500,000 of its construction grant allocation to construct a facility for training of treatment plant operators. (At first the authorization was only for \$250,000. This was increased to \$500,000 in 1977.) The States have utilized this funding in a variety of different ways, and to date 20 States and the District of Columbia have taken advantage of this program. Another 16 States are in various stages of interest and consideration of utilizing 109(b) funds for State training facilities. A listing of States that have utilized 109(b) funding and information on each State's program is shown in Table 3.

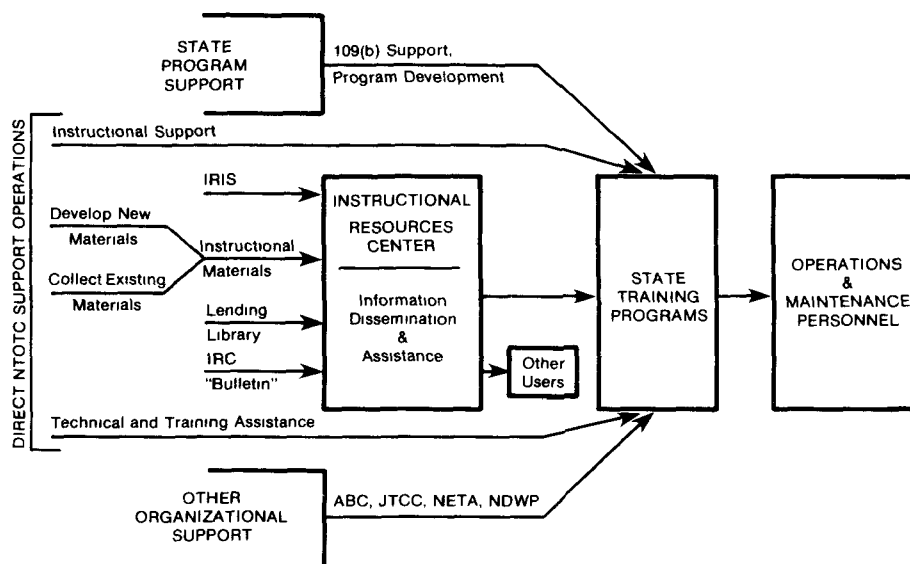


Figure 2. Interrelation of EPA Operator Training Activities

TABLE 3. SECTION 109(b) STATE TRAINING CENTERS

<u>State</u>	<u>Name of Institution</u>	<u>Location</u>	<u>Funding</u>	<u>Status</u>
Arkansas	Southern Arkansas University Technical Branch	East Camden, AR.	\$500,000	Operational- Additional construction to be complete in 6/83
Colorado	Community College of Denver	Denver, Colorado	\$500,000	Start construction 12/82; Complete in 10/83.
District of Columbia	Department of Environmental Services	Washington, D.C.	\$249,000	Operational
Florida	The University of Florida; TREEO Center	Gainesville, FL	\$250,000	Operational
Georgia	West Georgia College—Georgia Water and Wastewater Institute	Carrollton, GA.	\$500,000	Operational
Idaho	Boise State University— Wastewater Training Center	Boise, ID	\$500,000	Operational in 1/83
Iowa	Kirkwood Community College— Wastewater Treatment Plant Operator Training Center	Cedar Rapids, IA	\$500,000	Operational

TABLE 3. SECTION 109(b) STATE TRAINING CENTERS (cont.)

<u>State</u>	<u>Name of Institution</u>	<u>Location</u>	<u>Funding</u>	<u>Status</u>
Kansas	Kansas Environmental Training System—Kansas State Department of Health and Environment	Topeka, KN	\$500,000	Just starting operation
Maine	New England Regional Wastewater Institute	So. Portland, ME	\$320,000	Facility under construction
Maryland	Charles County Community College—Maryland State Training Center	La Plata, MD	\$500,000	Start construction 12/82/ Completion in 6/84
Massachusetts	Department of Environmental Quality Control	Boston, MA	\$500,000	State agency re-evaluating entire project
Missouri	Crowder College—Water and Wastewater Technology Division	Neosho, MO	\$250,000	Operational
New Hampshire	New Hampshire Water Supply & Pollution Control Commission	Concord, NH	\$340,000	Operational
New Jersey	Rutgers University—Cook College	New Brunswick, NJ	\$500,000	Operational
New Mexico	New Mexico State University—Occupational Education Branch	Las Cruces, NM	\$500,000	Operational
Oklahoma	Oscar Rose Junior College	Midwest City, OK	\$250,000	Operational
Utah	Utah Technical College	Orem, UT	\$500,000	Operational
Vermont	Vermont Technical College	Randolph, VT	\$163,000	Contract training project completed
Virginia	Virginia Operator Training Center—J. Sargeant Reynolds Community College	Richmond, VA	\$250,000	Operational
Washington	Green River Community College Washington Environmental Training Resources Center	Auburn, WA	\$500,000	Operational
Wyoming	Casper College—State Wastewater Training Center	Casper, WY	\$500,000	Operational

The Agency also used Section 104(g)(1) grant funds to support the development of training programs within a State. These projects were generally designed to initiate new training programs, such as one-year certificate programs within an educational institution, or to support the expansion or improvement of existing on-site assistance and classroom training programs. The majority of these grants were awarded through EPA's Regional offices.

NTOTC Program Support

Support programs operated directly by NTOTC included the establishment and management of an Instructional Resources Center (IRC), the development of instructional materials, the provision of instructional support to trainers and training institutions, and the provision of technical and training assistance. The Instructional Resources Center was designed as an information management and dissemination system to support the needs of water quality trainers and training institutions. The basis of the IRC is a computerized data system known as the Instructional Resources Information System (IRIS), which was developed in the mid-1970's. IRIS provides an information cataloging and retrieval capability that lists several thousand instructional resources (textbooks, training courses, audio-visual materials, etc.) related to water quality. Other components of the IRC include a lending library of water quality instructional materials (audio-visual materials and packaged training courses), a newsletter known as the IRC "Bulletin", and a training program assistance capability. The IRC also currently serves as a repository for all EPA developed training materials and all materials listed in IRIS. Thus, all trainers and training institutions have access to these materials for review prior to acquisition or for use in designing training courses and programs.

EPA placed emphasis on development of high quality, accurate training materials that could be used by trainers to satisfy a variety of training needs. These materials were developed to fill gaps in the existing array of available materials and to improve training in areas of high priority need. Because the development of such materials is generally very costly, this activity was seen as a means to utilize limited resources to meet the needs of many different individuals and institutions. The IRC capability was then used to disseminate information on the availability of such materials and to distribute them to the ultimate users.

Instructional support was provided by the staff of NTOTC to trainers and training institutions to promote the improvement of instructional programs and activities. In some instances, individualized assistance was given to help design a training course or program, or to provide instructional support as a means of improving the capability of the institution to continue the program on their own in future offerings. More frequently, instructional support was given through a series of "instructor workshops" where trainers were given an opportunity to improve their instructional skills and become more familiar with available resources, such as the IRC, that they could use to improve their own training programs. Other efforts in this area included a series of "instructional technology" training courses that were offered across the country as part of the field testing of a packaged course on instructional technology. An attempt was also made to test the concept of a National Trainers Institute (NTI) that would provide training to water quality instructors in both technical and instructional skills. If the concept of an NTI proved feasible, it was hoped that it could become self-supporting and a long term resource for trainers.

Finally, NTOTC staff expertise was available to States and training institutions to provide technical and training assistance in the areas of plant operations and operator training.

Support of Other Organizations

The third area of EPA support was to other organizations that had direct involvement in, or impact on, operator training programs. The availability of Section 104(g)(1) grant funds played a significant role in the establishment and accomplishments of two organizations. One was the Association of Boards of Certification for Operating Personnel in Water and Wastewater Utilities. This organization, known as ABC, is comprised of individual certification boards in each State, and is primarily concerned with the certification of operations personnel.

Another organization that received significant EPA support was the Joint Training Coordinating Committee. JTCC is comprised of representatives of the Water Pollution Control Federation; the American Water Works Association; the Association of Boards of Certification; the Federation of Associations on the Canadian Environment; the National Environmental Training Association; and the American Public Works Association. JTCC was established to promote the coordination of training efforts on a national basis and the establishment of State-level training coordinating committees. JTCC has produced a handbook that serves as a guide for organizing and implementing State committees; lists State contacts for operator certification and training; and provides methodology for evaluating operator training materials.

Another organization that was independently formed is the National Environmental Training Association (NETA). This organization is comprised of environmental trainers and works to support the needs of its members in improving and expanding needed training programs. Since inception, NETA has received EPA grant funds to provide useful information and activities related to operator training. They have completed a survey and compilation of sources of training and trainers; provided a clearinghouse function to coordinate training activities within two EPA regions; and conducted national conferences for member trainers.

Program Support Levels

During this time period, the continuation of EPA's operator training program was dependent for the most part on the authority and funding through Section 104(g)(1). Although a small amount of funding from Section 104(g)(3) was available to assist in supporting some curriculum projects, the majority of financial support came from the 104(g)(1) program. As in the years just prior to this time period, appropriations for Section 104(g)(1) continued at a level of \$1.1 million during FY 78. In FY 79, there was an increase in available Section 104(g)(1) funds to a level of \$3.332 million. Funding levels for FY 80 and FY 81 were \$2.448 million and \$1.267 million, respectively. In FY 82, following the closing of NTOTC, Congress provided additional funds to the Agency's appropriation to support operator training programs. Of these funds, \$3.868 million were available for extramural programs.

These funds were regularly divided between Headquarters managed "National impact projects" and regionally managed projects. Although many of the regional projects did support the concept of achieving a basis for self-support, many continued to meet a need for training operators in basic and upgrade skills.

Following the termination of MDTA funding for operator training in 1974, attempts were made to find other financial support programs. In 1978, an interagency agreement was signed with

the Department of Labor to encourage the use of the Comprehensive Employment and Training Act (CETA) to assist in training and employing persons in the wastewater facility operation field. A workshop was sponsored by EPA to help State and local agencies become familiar with, and make full use of, CETA programs. Where possible, EPA provided assistance, primarily through the Regional offices, to States interested in developing CETA programs. This program enabled the training of many personnel in the wastewater field, although its total impact is not known. CETA funding decreased shortly after this program's inception, and EPA resources to work on the program also decreased.

A summary of funding levels during this period of time is shown in Figure 3.

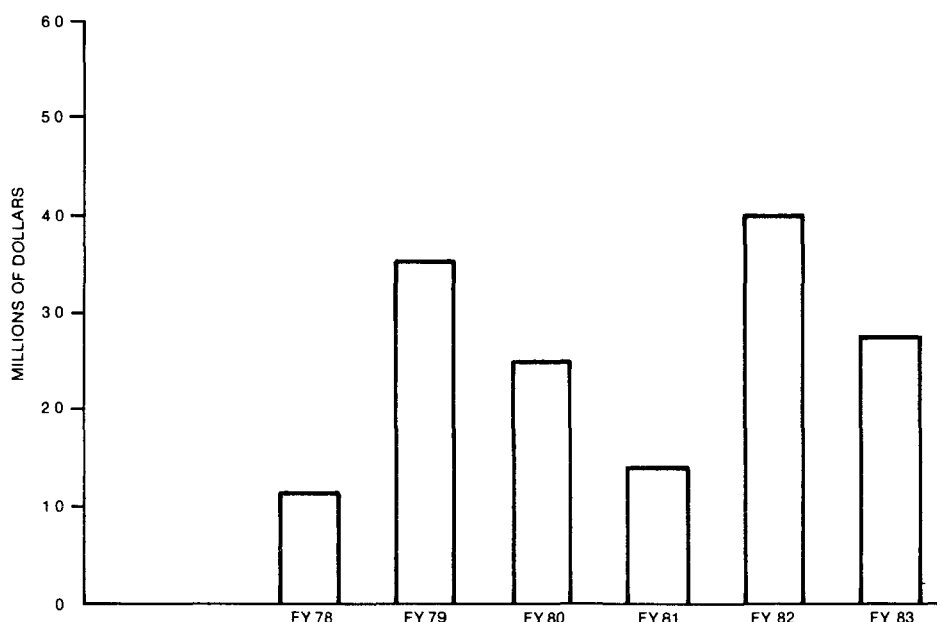


Figure 3. EPA Funding Levels For Operator Training

Program Accomplishments

During this five year period, progress was made in refocusing efforts within the three main program areas described earlier. Examples in each area include the following:

1) State Program Support

- 109(b) State Training Centers—Guidelines for funding eligibility were broadened, more direct assistance was given, and 15 grants for new centers were approved.
- Program refinements at several institutions were supported. An example is the start of a new one-year certificate program at the Southern Illinois University Environmental Resources Training Center.

2) Instructional Materials Development

- Refined and packaged the course on "Troubleshooting Operation and Maintenance Problems at Wastewater Treatment Plants"
- Developed packaged course on "Organic Analyses in Water Quality Control Programs"
- Developed packaged course on "Inorganic Analyses in Water Quality Control Programs"
- Refined and packaged training course on "Instructional Technology"
- Developed packaged training course on "Sludge Treatment and Disposal"
- Developed packaged training course on "Operational Considerations in Wastewater Treatment Plant Design"
- Developed packaged training course on "Management of Municipal Wastewater Treatment Facilities"
- Developed packaged training course on "Wastewater Facility Maintenance Management"

3) Organizational Support

- Promoted the development of plans and provided financial support that would lead to self-sufficiency for ABC, JTCC, NETA, the IRC program at Ohio State University, and the National Trainers Institute at Battelle Memorial Institute.

CURRENT PROGRAM STATUS AND EVALUATION

Current Status

EPA's headquarters in Washington, D.C. now handles the monitoring and administrative tasks related to on-going grant projects, and responds to current program management needs. This Agency office is working with the States to utilize the \$3,868,000 that Congress added-on to the Agency's FY 82 budget, and the \$2,625,200 added to the FY 83 budget, for the purpose of supporting operator training.

These funds are being funneled into State level training programs which focus on assisting operators of small treatment facilities to meet their performance requirements. Specifically, the funds will be used to provide for on-site plant evaluations in small noncomplying facilities, and on-site, over-the-shoulder training and technical assistance to correct operational problems. The total FY 82 grant funding was divided in the following way.

- 1) \$2,026,000 for grants to 20 State Training Centers established under Section 109(b).
- 2) \$1,200,000 divided equally among EPA's ten Regional Offices, for similar projects in States that do not have 109(b) centers.
- 3) \$575,000 grant for the National Water Demonstration Project to conduct a similar, highly-intensive, effort in four to six other States. This project is a coordinated effort that also involves the National Environmental Training Association and the American Clean Water Association.

An additional \$67,000 grant was awarded to the Association of State and Interstate Water Pollution Control Administrators to conduct a survey of current State operator training programs. The findings of this study, in conjunction with the results of the other on-site training projects, will provide information for evaluating the operator training situation, and determining future program policies and directions.

All of these projects have evaluation steps and intermediate reporting requirements that will allow EPA to measure the effectiveness of this approach. Because the funding became available to the Agency late in the fiscal year, actual projects activity, under most grants, began in October 1982. Conclusive results are not expected until late 1983. Essentially all FY 83 funds are expected to be allocated to States to continue and expand efforts begun in 1982.

Program Evaluation

The objectives of EPA's operator training program progressed throughout the total life of the program. A primary objective in the early years was to meet a rapidly growing demand for trained operators. A variety of manpower training and employment programs were successfully used to meet this demand. At least 15,000 persons were trained in the field of plant operations between the years of 1969 and 1977. In addition, there was a great amount of support given to the development of training curricula and materials, and the establishment of training institutions and other support organizations that contributed to improving the development and implementation of training programs.

Significant outputs from the early period of the national operator training effort included the following:

- The development of a two-year technician training curriculum
- The development of a two-year water quality monitoring technician training curriculum
- The development of a basic level operator training correspondence course
- The development of an instructional technology training program that is now available in packaged form
- The development of the Instructional Resources Information System, a computerized information storage and retrieval system for water quality instructional materials
- Assistance in the formation and support of the Association of Boards of Certification, which has developed a broad program for establishing and operating state certification programs
- Assistance in the formation and support of the Joint Training and Coordinating Committee, which has developed guidance for promoting more effective, well-coordinated training programs on a State-wide basis

During the past five years, the EPA established programs and institutions based on the premise that future self-sufficiency was a highly desirable characteristic. A variety of different program activities were undertaken as outlined in the previous section. The status and progress of the most significant of these activities is outlined below:

- The development of operator training instructional materials. The emphasis was placed on high priority areas such as process control, troubleshooting, sludge treat-

ment, and facility management. A total of 16 packaged courses were initiated or completed. Almost all are now complete and available for use.

- The Instructional Resources Center (IRC). The number of instructional materials now contained in the IRC software package (IRIS) has grown more than 7,000 data units. Requests for assistance on obtaining materials and other training related information have averaged more than 2,000 per year, and the IRC "Bulletin" had reached a distribution of more than 10,000. The IRC is now in a period of declining Federal support with actions underway to develop a self-supporting operation within two years. At this time, it appears that most of the IRC services can become self-supporting. This can be achieved based on income from subscription fees, handling and postage charges and publication sales.
- The Association of Boards of Certification (ABC). During the last few years, ABC has developed a program, financed by a multi-year grant, with declining Federal support, to market a variety of services to its State member boards. A variety of examination services will be offered to member certification boards, ranging from providing test questions to providing a complete examination and grading service. Technical assistance and program audits are other services being offered to member boards. The leadership of ABC is optimistic that the use of these services will grow sufficiently in the next few years and will provide an adequate base upon which to operate without outside financial support.
- The Joint Training Coordinating Committee (JTCC). This organization had a number of projects previously funded by EPA grants. Products included a directory of State Agency training and certification personnel, a guide to developing a State training coordinating committee, and a process for evaluating operator training instructional materials. Current activities are focused on providing a coordinating activity for member organizations and State coordinating committees.
- The National Trainers Institute (NTI). This project is managed through a grant with Batelle Memorial Institute. Eight courses for water quality trainers have been presented on technical and instructional topics. Attendance has varied among the courses. There is not yet enough data to evaluate the success and potential of this concept, or whether it can be self-supporting.
- The National Environmental Trainers Association (NETA). This organization was independently formed and has accepted EPA grants to carry out mutually supportive projects. NETA is comprised of individual members concerned with environmental training. The organization undertakes projects primarily to serve its members. To date NETA has developed a directory of environmental trainers and sources of training; has provided a clearinghouse function for training activities within two EPA Regions; and has annual conferences for its members. NETA has a plan to achieve self-sufficiency based on services offered to members and other trainers.

- The National Demonstration Water Project (NDWP). This consortium project (also involving NETA and the American Clean Water Association) is helping States identify and aid small facilities requiring on-site, over-the-shoulder assistance needed to achieve and maintain effective operations and maintenance. This project was initiated late in FY 82 and will be evaluated throughout the year.

FUTURE DIRECTIONS

The Agency and States are implementing results-oriented policies to ensure municipal wastewater treatment facilities achieve and maintain compliance with permit and effluent requirements. Accomplishing these results will require effective operations and maintenance practices by trained operators.

EPA encourages State (and local) responsibility for providing adequate training programs, which will produce the qualified personnel needed to operate current and future wastewater treatment facilities. The Agency believes that past efforts to establish State self-sufficiency have provided the basis for an accelerated transition of overall training program management and funding responsibility to States.

Operator training funds, added by Congress to the Agency's budgets, are being channeled primarily to ongoing State training efforts through State training centers or State agencies.

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