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ABSTRACT

The report describes a study of industry-sponsored upgrading programs for journeymen in construction unions. Interviews with union and training officials, as well as 405 journeymen and 99 contractors, revealed that upgrading activities were concentrated in electrical work, carpentry, and the pipe trades, and that both the number of programs and journeymen's participation had increased rapidly since 1970. Courses were offered in response to worker demand, and were taught by union members, using either school or industry training facilities. Welding, safety, and blueprint reading were offered in most trades, with a variety of specialized courses taught in individual locals. No significant differences were found between participants and non-participants, except that more participants had been trained in apprenticeships. Several suggestions are made for improving upgrading programs, including the prospect of using these programs to assist in bringing more minority journeymen into building trade unions. Appended are lists of persons who provided information for the study and interview forms for journeymen and contractors. A 14-item bibliography is also included. (Author/MS)

Upgrading Programs for Construction Journeymen

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June, 1975

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16. Abstracts

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Industrial relations
Industrial training
Instructors
Labor
Labor unions
Learning
Manpower
Manpower requirements
Manpower utilization
Negroes
Productivity
Schools
Skilled workers
Specialized training
Statistical analysis
Supervisors
Supply (economics)
Unskilled workers
Upgrading

17b. Identifiers/Open-Ended Terms

Building trades
Construction unions
Carpenters
Electricians
Ironworkers
Operating Engineers
Pipefitters
Plumbers
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Construction contractors

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UPGRADING PROGRAMS FOR CONSTRUCTION JOURNEYMEN

In recent years considerable attention--both in the form of research and public policy--has been paid to problems and issues related to skill training in construction.[1] Most of the research has focused on union apprenticeship programs, particularly on the effectiveness of apprenticeship as a form of training, its adequacy in meeting the industry's growing manpower needs, and its role in increasing the employment of minority-group members in construction. All of these efforts have been significant, because they have substantially increased the body of knowledge concerning the initial training received by growing numbers of workers when they begin careers in construction.

After workers enter the construction industry, however, they must keep their skills up to date, learn how to work with new products and processes, and brush up from time to time on skills which have deteriorated through disuse. Though these problems are faced by all workers in the industry, they are especially troublesome for the large numbers of journeymen who have never received formal training, in apprenticeships or otherwise. These journeymen--the majority of union members in numerous trades--have been trained informally and often haphazardly, sometimes "picking up" their trades by observing other journeymen. The hit-or-miss nature of these workers' training has enabled many of them to acquire skills in only one or a few areas of their crafts, and thus to be more susceptible to unemployment and reduced earning power than

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[1]See, for example, Thomas A. Barocci, "Apprentice Dropouts: Cause and Effect," Manpower, Vol. 11, No. 3 (October, 1972), pp. 314-325; Howard G. Foster, "Apprenticeship Training in the Building Trades: A Sympathetic Assessment," Labor Law Journal, Vol. 22, No. 1 (January, 1971), pp. 3-12; Ray Marshall and Vernon M. Briggs, Jr., The Negro and Apprenticeship, Baltimore, Maryland: Johns Hopkins Press, 1967; Alex Maurizi, "Minority Membership in Apprenticeship Programs in the Construction Trades," Industrial and Labor Relations Review, Vol. 25, No. 2 (January, 1972), pp. 200-206; and Daniel Quinn Mills, Industrial Relations and Manpower in Construction, Cambridge, Massachusetts: MIT Press, 1972.

apprentice-trained journeymen.[2]

In spite of the fact that it is just as necessary for workers to maintain their skills as it is for them to acquire such skills in the first place, the literature on training in construction has been virtually silent on the subject of upgrading and refresher training for journeymen. The only recent study containing information about continuing training for construction journeymen is Drew's study of the pipe trades, and even this work gives relatively brief treatment to upgrading.[3] This gap in research is unfortunate, because in recent years industry apprenticeship and training programs have begun to offer a wide variety of formal trade-related course work to their journeymen who wish to avail themselves of the opportunity to keep up with their trades systematically. Though practically no notice has been given to these formal upgrading efforts, they are potentially an important mechanism by which the construction labor force can adapt itself to the industry's changing manpower requirements.

Objectives

This study was undertaken as a first approximation of a description of journeyman upgrading programs in the building trades. Its purpose was to describe the upgrading programs underway in two cities, in order to estimate the significance of such efforts in helping construction workers keep abreast of changes in the industry. Specifically, the project was designed to

(1) Provide detailed information about the trades that are most active in formal upgrading activities, the kinds of courses offered and the regularity of their offerings, and the extent of journeymen's participation in upgrading courses;

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[2]For a description of the differences in training between apprentice-trained journeymen and other construction workers, see Ray Marshall et al, Training and Entry into Union Construction, Springfield, Virginia: National Technical Information Service, 1974 (accession #PB-29937/AS).

[3]Alfred S. Drew, Educational and Training Adjustment in Selected Apprenticeable Trades, Lafayette, Indiana: Purdue Research Foundation, Purdue University (mimeograph), 1969.

(2) Gather data on the personal characteristics and training backgrounds of journeymen who have participated in upgrading classes, in hopes of learning what type of worker is most likely to take part;

(3) Discover, if possible, the degree to which the employability and prospects for promotion have been improved for workers who have participated in upgrading courses;

(4) Call on the experiences of journeymen, contractors, and training program personnel to evaluate the effectiveness of upgrading;

(5) Suggest ways in which upgrading programs can be improved to serve the industry better; and

(6) Make a realistic estimate of the prospects for using upgrading programs to speed the intake of minority-group members--especially minority workers with construction backgrounds--into full union membership and stable employment. Such training might be of significant assistance to outreach programs designed to reach minority journeymen, as well as apprentices.

Project Design and Methodology

Project research was carried out between March and November, 1974, in Washington, D.C., and Miami, Florida. The trades selected for study were carpenters, electricians, operating engineers, plumbers, steamfitters,[4] and ironworkers. Since the ironworkers in Miami and Washington and the operating engineers in Miami had no upgrading programs underway at the time of the study, there were nine unions included in the survey:

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[4]In this paper, as in the construction industry, the terms "steamfitters" and "pipefitters" are used interchangeably to designate workers who deal with the air conditioning, heating and refrigeration branches of the pipe trades. When referring specifically to such workers in Washington, however, the word "steamfitter" is used, as is "pipefitter" in reference to members of the Miami local, since the two local unions use different names.

Miami	Washington
Carpenters District Council	Carpenters District Council
Electricians (IBEW) Local 349	Electricians (IBEW) Local 26
Plumbers (UA) Local 519	Operating Engineers Local 77
Pipefitters (UA) Local 725	Plumbers (UA) Local 5
	Steamfitters (UA) Local 602

The principal research tools were telephone interviews with samples of journeymen from each local union and with contractors who employed members of the unions under study.[5] In all, 405 journeymen and 99 contractors were interviewed, and these interviews provide the basis for most of the data discussed below, relating to personal and training backgrounds of journeymen, courses taken and evaluation of upgrading efforts. General information about the development and presumed directions and objectives of upgrading courses was obtained in personal interviews with program training directors and union business managers in Miami and Washington. These sources also provided insights into the types of workers who participate in upgrading, the kinds and frequency of course offerings, format and materials used, and the like. In addition, telephone interviews were conducted with union officials and training directors in several other cities in April and May, 1975, to learn whether the programs studied in depth in Miami and Washington were similar in objectives, course offerings, funding arrangements, and organization to journeyman training efforts in other parts of the country. The following unions were included in the latter survey:

Atlanta	Austin, Texas
Carpenters Local 225	Carpenters Local 1266
Electricians (IBEW) Local 613	Electricians (IBEW) Local 520
Ironworkers Local 387	Ironworkers Local 482
Operating Engineers Local 926	Plumbers and Steamfitters (UA) Local 286
Plumbers and Steamfitters (UA) Local 72	

[5]Sample interview forms may be found in Appendices B and C.

Chicago

Carpenters District Council
Electricians (IBEW) Local 134
Ironworkers Local 1
Operating Engineers Local 150
Plumbers (UA) Local 130

Columbus, Ohio

Carpenters Local 200
Electricians (IBEW) Local 683
Ironworkers Local 172
Plumbers and Steamfitters (UA) Local 189

Houston

Carpenters District Council
Electricians (IBEW) Local 716
Ironworkers Local 84
Operating Engineers Local 450
Pipefitters (UA) Local 211
Plumbers (UA) Local 68

San Francisco

Carpenters District Council
Electricians (IBEW) Local 6
Ironworkers District Council
Operating Engineers Local 3

Other data came from industry representatives and officials in the Bureau of Apprenticeship and Training.

I. EXTENT OF JOURNEYMAN UPGRADING EFFORTS

The unions in this study were selected because it was felt that, with their traditions of strong apprenticeship programs,[6] they would be most likely to have extensive journeyman upgrading programs. In fact, at the time of the survey they were the only unions in either city to have formal courses for journeymen: interviews with training directors and business managers of all other unions in both Miami and Washington revealed that no union outside the sample had yet implemented an upgrading program for its journeymen (though several said they hoped to establish courses in the future). Thus the locals surveyed actually made up the universe, rather than a sample, of the unions offering upgrading courses.

Since the foregoing was something of a surprise, an attempt was made to find out if the situations in Washington and Miami were typical, or whether information regarding the nationwide extent of upgrading efforts would show the sample cities to be abnormal in this respect. Again, surprisingly--and unhappily--there seem to exist no comprehensive data detailing the number and kinds of programs, by trade, that are operating across the country. Although the objectives of the survey did not include the retrieval of primary data of this type on a nationwide basis, a substantial amount of information concerning course offerings and organization was obtained in the six-city telephone survey of training directors and union officials: this information is presented later in this section. Further, an estimate of the relative importance of various courses, by trade, was made on the basis of reports to the Bureau of Apprenticeship and Training (BAT). The data obtained from the BAT reports for 1973 and from the telephone survey of sample unions indicate that, while there is considerable variation in upgrading efforts, the programs selected for this study are in important ways typical of unions throughout the nation.

BAT Reports

Field representatives of the Bureau of Apprenticeship and Training (BAT) make semiannual Skill Improvement Account

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[6]The operating engineers do not fit this generalization; their emphasis on apprenticeship training began relatively late.

Status Reports on BAT-sponsored training efforts, both in and out of construction, which are not registered apprenticeship programs. These activities include nonregistered apprenticeship programs, diverse employer- and union-initiated training programs, and journeyman upgrading programs.

BAT reports offer only fragmentary evidence concerning the extent of journeyman training in progress, however, for two major reasons. The first is that field representatives report on only the "federally serviced workload" -- programs either instigated by BAT or actively receiving advice from BAT on training procedures, course offerings, time devoted to training, and so on. Since most upgrading programs operate outside these spheres of BAT influence, their activities go largely unreported. An equally serious drawback to BAT's figures is the fact that in 29 states apprenticeship and training activities are monitored primarily by state apprenticeship councils (SAC's); in those states, the role of BAT is even more limited than in the states in which BAT is the primary monitoring agency. Thus, for example, BAT received reports of only one upgrading program in California and only scattered information from New York, partly because the largest two states are SAC states.[7]

Because of important gaps in coverage, therefore, any conclusions drawn from BAT reports should be accepted only warily. Nonetheless, a summary of BAT's information on union- and JATC-sponsored upgrading programs appears below, as an outline of the apparent relative importance of various retraining activities in union construction.

Upgrading Activities by Trade. The most salient observation that can be made is that upgrading efforts are concentrated in a very few trades. As Table 1 shows, electrical

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[7]In 1973, BAT received reports on upgrading programs from only 37 states; of those, 12 (Alabama, Connecticut, Delaware, Florida, Georgia, Idaho, Indiana, Maryland, Mississippi, Montana, North Carolina, and Pennsylvania) reported no journeyman upgrading efforts in union construction. Thirteen states (Colorado, Iowa, Kansas, Kentucky, Maine, Michigan, Nebraska, New Hampshire, Ohio, South Carolina, Tennessee, Utah, and Vermont) made no reports on upgrading activities in any industry in 1973.

Table 1

Journeyman Upgrading Programs in Progress Throughout the U.S., By Trade, 1973

Trade	Number of Programs	Percent of All Trades	Total Enrollment	Percent of All Trades	Total Hours Instruction	Percent of All Trades
Carpentry	61	23%	1,369	20%	106,038	28%
Electrical	86	32%	2,257	33%	107,650	28%
Pipe Trades	62	23%	1,438	21%	74,856	19%
Sheet Metal	21	8%	650	10%	14,695	4%
Other Trades	41	15%	1,082	16%	81,133	21%
All Trades	271	100%[a]	6,796	100%[a]	384,372	100%[a]

[a]Column totals may not equal 100% due to rounding.

SOURCE: Skill Improvement Account Status Reports--MA 6-88 (BAT 106).

work, carpentry, plumbing and pipefitting together accounted for 75 percent of upgrading programs, persons enrolled in training, and total hours of instruction given in 1973; thus the concentration of upgrading efforts in the "sample" unions in Washington and Miami should have been expected, after all. Other courses were scattered among the operating engineers, ironworkers, painters, masonry trades, boilermakers and roofers, with two programs offered to craftsmen in all trades by builders associations. It may be significant, as originally suspected, that upgrading activities take place chiefly in the mechanical trades and carpentry, because those are the trades in which formal skill training is most appropriate. They are also the trades in which formal apprenticeship programs are best established and increasingly important sources of manpower.

Course Offerings. Welding was the most commonly offered upgrading course, accounting for 74--or one-fourth--of the total programs offered in 1973. Welding was most important in the pipe trades, comprising half the 62 course offerings for plumbers and pipefitters. Three other courses had numerous offerings across trades: blueprint reading, sketching and drafting (25), safety and first aid (23), and plumbing and electrical codes (19). The remaining 130 programs varied considerably among trades; they are summarized in Table 2. That the above also proved to be the courses most commonly taken by journeymen in the survey is partial evidence that the crafts surveyed are, in this respect, typical of those in the rest of the country.

Results of Telephone Survey

Telephone interviews with union officials and training directors in Atlanta, Houston, Chicago, San Francisco, Austin, Texas, and Columbus, Ohio revealed a number of common characteristics that were also found in the journeyman training programs in Miami and Washington. The most noticeable patterns were:

(1) The most extensive upgrading efforts were made in electrical work and the pipe trades. Every IBEW and UA local was offering or had offered numerous upgrading courses for journeymen; in most cases these efforts had been continuous for ten to fifteen years. By contrast, half of the carpenters and ironworkers training programs offered no journeyman training at all, and although all operating engineers locals offered journeyman classes, most programs had been in place less than five years. Course offerings in these trades were, for the most part, sporadic,

Table 2

Journeyman Upgrading Courses in Progress Throughout the U.S., By Trade, 1973

CARPENTRY

Courses (15)	Number of Programs	Total Enrollees in Programs	Total Hours Instruction
Welding	19	502	37,214
Blueprint Reading	11	287	11,332
Transit, level	7	124	4,980
Safety/First Aid	4	106	1,010
Cabinet, woodwork	4	60	5,132
Estimating	3	53	2,120
Steward training	2	60	2,560
Piledriving	2	32	33,168
Rigging	2	30	1,200
Roof framing	2	29	1,160
Laser beam	1	20	1,750
Residential carpentry	1	20	1,440
Conveyor maintenance	1	16	1,172
Optical tools	1	15	1,200
Trade math	1	15	600
	61	1369	106,038

SOURCE: Skill Improvement Account Status Reports—MA 6-88 (BAT 106).

Table 2 (cont.)

ELECTRICAL WORK

Courses (23)	Number of Programs	Total Enrolled	Total Hours Instruction
Code	15	376	16,993
Welding	12	361	28,548
Safety/first aid	11	633	5,927
Motor controls	10	190	25,414
Theory	5	110	4,820
Electronics I	5	75	4,558
Heating/air conditioning	4	76	4,698
Static controls	4	73	3,603
Transformers	3	54	1,520
Rigging	2	40	2,040
Electronics II	2	32	1,264
Blueprint reading	2	26	1,128
Slide rule	1	40	400
General	1	26	1,170
Radio I	1	24	1,296
Tool control	1	23	69
Leadership	1	20	400
Lineman training	1	18	864
Transistors	1	15	1,080
Drafting	1	14	280
Radio II	1	12	648
Transit & level	1	10	120
Cable splicing	1	9	810
	86	2257	107,650

SOURCE: Skill Improvement Account Status Reports--IA 6-88 (BAT 106).

Table 2 (cont.)

PIPE TRADES

Courses (12)	Number of Programs	Total Enrolled	Total Hours Instruction
Welding	31	721	38,817
Refrigeration, heating, air conditioning	6	147	6,320
Sketching, blueprint reading	5	61	1,955
Safety/first aid	4	63	2,420
Plumbing code	4	36	1,659
General upgrading	3	166	14,432
Pipefitting	3	57	2,229
Copper/brass piping	2	40	160
Steward training	1	75	3,000
Boiler systems	1	50	2,000
Estimating	1	12	864
Basic Electricity	1	10	1,000
	62	1438	74,856

SOURCE: Skill Improvement Account Status Reports--MA 6-88 (BAT 106).

Table 2 (cont.)

SHEET METAL WORK

Courses (12)	Number of Programs	Total Enrolled	Total Hours Instruction
Safety/first aid	4	265	2,650
Welding	4	63	2,540
Sketching	2	39	1,480
Plastic	2	24	1,920
Layout	2	17	810
Fiberboard	1	139	695
Sheet Metal cutting	1	32	2,304
Ceiling Installation	1	23	552
Air conditioning/Air balancing	1	19	760
Blueprint Reading	1	17	510
Trade math	1	11	330
General	1	1	144
	21	650	14,695

SOURCE: Skill Improvement Account Status Reports--MA 6-88 (BAT 106).

Table 2 (cont.)

OTHER TRADES

Trades	Number of Programs	Total Enrolled	Total Hours Enrolled
Operating Engineers	13	419	55,976
Ironworkers	12	205	7,080
Painters	7	177	10,996
Masonry	4	107	3,065
General	2	93	690
Boilermakers	2	30	3,122
Roofers	1	51	204
	41	1082	81,133

SOURCE: Skill Improvement Account Status Reports--MA 6-88 (RAT 106).

except in the case of the Northern California operating engineers.

(2) Courses were almost exclusively demand-based; i.e., a course would be offered only if enough journeymen (say 10 to 15) expressed an interest in training for that specific skill. In most programs, training directors or business agents sent letters to journeymen or made announcements at union meetings, enumerating the courses that would be offered if sufficient demand existed; if enough journeymen responded, the courses were taught. Rarely were courses offered in response to unsolicited demand, however, since few journeymen made their wishes for training known without prompting.

(3) Welding was the most widely available course, largely because it is a skill used in many trades; similarly, blueprint reading and safety courses were offered by various trades. Motor controls, electrical codes, electronics, and heating/air conditioning courses were commonly offered in IBEW programs, as were plumbing codes, refrigeration, and pneumatic controls in the pipe trades. Operation of various types of heavy equipment was taught in operating engineer programs, and the use of the transit and level was most frequent offering in carpentry.

(4) Journeymen's participation in upgrading, as estimated by training directors, was much higher in electrical work and the pipe trades than among carpenters, ironworkers, or operating engineers. In the former trades, it was usually estimated that between one-fou. th and one-third of all journeymen members had taken journeymen courses at one time or other, and there were several estimates of 50 percent participation in IBEW locals. By contrast, only one training director in the other three crafts estimated a participation rate as high as one-fourth; the rest were under ten percent, often as low as one or two percent. Naturally, part of the reason for lower rates among the latter three trades stemmed from their having been offered for a shorter period of time.

(5) Nearly all instructors were journeymen members of the local unions. Occasionally a certified nonunion welding instructor, a local building inspector, or a manufacturer's representative would teach a course which local members were not qualified to handle. As a rule, however, it was felt that journeymen instructors were better suited to communicate with other journeymen, particularly in their ability to relate

course contents to situations encountered in construction.

(6) Almost all programs were offered, at least in part, through the auspices of local vocational high schools or community colleges. Most teachers' salaries were paid partly out of school system monies and partly out of industry training funds. In addition, many programs did not own their own training facilities, and were obliged to use school facilities and equipment. Curriculum development was exclusively the province of the training programs.

Courses Offered in Survey Unions

The courses that were most prominent in journeyman upgrading programs nationwide were also significant in the unions in Miami and Washington. This section describes the organization and implementation of these course offerings, by trade, and the frequency with which journeymen participated in each course.

Carpenters District Council, Washington. The carpenters in Washington had offered only welding courses to their journeymen, and those for only four years. The journeymen who had taken part were usually millwrights or piledrivers, rather than general carpenters. This 80-hour course, taught by a certified welding instructor, was designed primarily to certify welders for underground work on the Metro subway system; since underground work was in the piledrivers' jurisdiction, around 75 members of the 500-member piledrivers local had taken the welding course. Millwrights taking journeyman welding classes were not likely to have been through the union's apprenticeship program, since all millwright apprentices must certify as welders as part of their apprenticeships.

Even the limited welding offerings for journeymen had been suspended at the time of the survey. Certain problems related to course aims and organization were being worked out, after which the Joint Apprenticeship and Training Committee planned to reinstitute the welding course, and hoped to expand course offerings into other areas.

IBEW Local 26, Washington. A wide range of courses for journeymen electricians had been offered for many years by Local 26, and the director of the industry training facility estimated that around half of the members had taken some part in upgrading. At the time of the survey, some 250, or about 15 percent, of the local's 1700 journeymen members were enrolled in

various refresher courses. Over the years, the most popular offerings had been courses in electrical code, motor controls, welding, electronics, cable splicing, air conditioning/refrigeration, and safety and first aid. Some courses, such as air conditioning/refrigeration, had been available for only a couple of years, while code classes had been offered since before anyone could remember. Classes varied in length from two weeks (first aid) to a 30-week school year (cable splicing, welding).

Facilities, materials, and most instructors were provided solely by the joint industry training program. Journeyman courses were held in the same training center used by the apprenticeship program, which included numerous shops for cable splicing, electrical controls, fire alarm systems, and the like, as well as classroom space. Some class materials had been developed by the local training program; others were supplied by the training director of the National Electrical Contractors Association (NECA). Except for welding, air conditioning, and electronics, all courses were taught by members of the local union.

Operating Engineers Local 77, Washington. This local had offered training for journeymen in the operation of hydraulic backhoe equipment since 1966, and in tower crane operation since 1973. In addition, some operators picked up skills by operating certain machines on weekends, outside of classes. Formal classes lasted ten weeks, with forty hours of instruction in class and forty hours on the machines. Unlike other trades, in which classes were taught at night, the engineers held classes on Saturdays because of the need for daylight to run the machines. Instructors were union members, often the people who, during the week, operated the machines used in the journeyman classes. Only about 110 journeymen, or five percent of the local's members, had taken part in these courses.

The equipment used in the engineers' classes was rented or loaned by contractors, though their international union had acquired much of the machinery used in other training programs from the federal government's surplus property program. In contrast with the other unions surveyed, however, this local financed its programs with funds obtained from the Department of Labor by the international union under MDTA. All other unions financed their programs from private, joint industry trust funds.

Plumbers Local 5, Washington. The plumbers local in Washington had offered courses only in welding, plumbing codes, and drainage and venting of waste water. All courses were taught by union members, with UA-developed training materials (except for the drainage course). Around twenty percent of the local's 775 active journeymen had taken part in these courses, which were five to six weeks (30 hours) long. Part of the reason for limited offerings was the lack of a private training facility and of a full-time training director. Classes would be scattered among local high schools until the new training center (to be shared with the steamfitters) was completed, at which time the union intended to expand its offerings.

Steamfitters Local 602, Washington. Local 602 had only limited journeyman course offerings, for reasons similar to the plumbers'-- lack of facilities and coordination. Welding and gas fitting courses had been offered for two years; refrigeration and drafting courses had been available for only one year. However, about 300 of the local's 1200 active journeymen members had taken part in these courses in those two years; encouraging results have prompted the union to plan for additional offerings when their training center opens.

Courses were organized and financed solely by the industry, and all instructors were union members. Some course materials had come from the UA training office, but most had been developed by the local union.

Carpenters District Council, Miami. The carpenters in Miami have implemented a much broader spectrum of courses for journeymen than their counterparts in Washington, although welding is the most common course taken by journeymen. Other classes, given intermittently according to demand, included blueprint reading, estimating, laser beam levelling, and safety instruction to qualify supervisors under the Occupational Safety and Health Act (OSHA). In fact, nearly all carpentry foremen and superintendents had qualified under OSHA in these classes, as had numerous members of other Miami unions. In addition, manufacturers' and suppliers' representatives regularly gave short courses on the installation of new building materials. All told, around 25 percent of the eligible journeymen had participated in upgrading classes, though many of these were in OSHA, rather than skill improvement classes.

Courses lasted up to six months and were taught by union members, except for the short courses on new materials. OSHA

classes were taught at one of the union halls; the others were given at a local junior high school. All funding, however, came from the industry, and not from public monies.

IBEW Local 349, Miami. When the survey was made, the training program in Local 349 was teaching courses in electrical codes, blueprint reading, motor controls, electrical theory, welding, and trade-related mathematics. Cable splicing, static controls, and electronics had been taught in the past but were not offered in 1974. Each course was made up of one or more 16-18 week segments, and was taught by local union members. High school facilities were used, and instructors' salaries were paid by the school system; other expenses were paid out of the industry's joint apprenticeship and training trust fund. Nearly half the local members had participated at some time in the past.

Plumbers Local 519, Miami. Plumbing courses for journeymen in Miami had been available since 1957, when the first plumbing code class was formed. In the interim, classes in welding, water balancing, waste water drainage and venting, and estimating had been taught; code and welding had been most popular. Classes lasted either one semester or one school year, and were taught exclusively by union members, usually foremen who command a great deal of respect from other members. Instructors were paid partly by the school system and partly by the industry training fund; training facilities were provided at the union's apprenticeship and training center. Around one-fourth of the union's journeymen had taken part in these courses in the past.

Pipefitters Local 725, Miami. The pipefitters' training situation in Miami was closely kin to the plumbers', though courses had been offered in Local 725 for only six or seven years. Code, welding, and water and air balancing were the principal courses offered, though numerous others had been given in the past. The pipefitters had their own training facility, and instructors were union members. Funding arrangements were the same as in the plumbers local. Perhaps twenty percent of the journeymen members had been involved in upgrading classes.

Relative Importance of Individual Upgrading Courses

Of the 405 journeymen surveyed in this study, only 187, or 46 percent of the sample, had participated in upgrading courses

offered through their unions. (At that, as will be explained later, the sampling procedure biased the percentage of participants upward). Of these 187, only five had taken more than three courses; the majority had taken only one. In all, the participants took a total of 291 courses (though several interviewees indicated they had taken certain courses, such as code or welding, more than once). The courses taken by surveyed journeymen, by union, are arrayed in Table 3.

In general, the courses in which Miami and Washington journeymen most often took part were those that appeared most often in BAT reports, and which were most prominent in the telephone survey of training programs in other cities. Welding, with almost 20 percent, led all courses; first aid and safety, drafting, and blueprint reading were common among several trades. In the pipe trades, air conditioning/refrigeration, heating, controls, and plumbing codes were most often attended, while electrical code, electronics, and motor controls dominated the courses taken by electricians. Only in carpentry was there less variety among courses, chiefly because of the unavailability of courses other than welding in Washington.

By way of summary, this section has shown available records to indicate that journeyman upgrading efforts are concentrated in a few basic trades--carpentry, electrical work, and the pipe trades--which, with the operating engineers, were the unions selected for study in Washington and Miami. Not only were the trades in the survey cities those which had done most in upgrading in other areas of the country, but the courses most offered in Miami and Washington were those that were most prominent in other areas. Further, the courses in Miami and Washington resembled those in the six-city telephone survey in organization, funding arrangements, instructors, and journeyman participation rates. Thus, while there is probably no such thing as a typical union or city, it was some comfort to recognize that this study was dealing with programs that approximate some national norm. The following section discusses numerous aspects of individual programs at length.

Table 3

Upgrading Courses Taken by Surveyed Journeymen, by City and Trade, 1974

Washington

Course	Carpenters	Electricians	Operating Engineers	Plumbers	Steam-fitters
Welding	5	4		7	12
Heliarc welding					4
Refrigeration/ Air conditioning		1		1	10
Air balancing					
Water balancing					2
Air conditioning/ Heating					1
Pipefitting					
Gasfitting					2
Air conditioning/ Refrigeration controls					3
Plumbing code				2	
Foremanship				1	4
Electrical code		4			
Electronics		8			
Electrical theory					
Cable splicing		6			
Motor controls		3			
Hydraulics			3		
Tower Crane			13		
Backhoe			4		
Miscellaneous heavy equipment			2		
Drafting				1	4
Blueprint reading					
New products					
Building code					
First aid/Safety		1	1		
General upgrading					
Other	—	1	7	1	1
TOTALS	5	28	30	13	43

SOURCE: Interviews with Journeymen, Miami and Washington.

Table 3

Upgrading Courses Taken by Surveyed Journeymen, by City and Trade, 1974 (cont.)

Miami

Course	Carpenters	Electricians	Plumbers	Pipefitters	Total all Unions
Welding	3	2	6	15	54
Heliarc welding				2	6
Refrigeration/ Air conditioning				4	16
Air balancing				3	3
Water balancing			1	1	4
Air conditioning/ Heating		1		5	7
Pipefitters				4	4
Gasfitting					2
Air conditioning/ Refrigeration controls		1		13	17
Plumbing code			12		14
Foremanship		2	1		8
Electrical code		16			20
Electronics		6			14
Electrical theory				1	1
Cable splicing		1			7
Motor controls		12			15
Hydraulics					3
Tower Crane					13
Backhoe					4
Miscellaneous heavy equipment					2
Drafting			5	2	12
Blueprint reading	3	4	1	3	11
New products	1				1
Building code			1	1	2
First aid/Safety	12	6			20
General upgrading		3			3
Other		7	5	6	28
TOTALS	19	61	32	60	291

SOURCE: Interviews with Journeymen, Miami and Washington.

II. CHARACTERISTICS OF UPGRADING PROGRAMS

One of the principal aims of the study was to learn as much as possible about the characteristics of journeyman training programs, including not only their organization (as outlined in the previous section), but also the reasons journeymen had for taking part in upgrading, ways in which information about courses was disseminated to journeymen, and the strong and weak points of the various courses. That information is discussed in this section of the report; an assessment of program effectiveness and recommendations for improving upgrading efforts are made in the concluding section.

The data describing various characteristics of upgrading courses were gathered in interviews with training directors, journeymen who had taken part in upgrading classes, and, to a minor extent, with contractors, whose inputs are discussed at the conclusion of this section. For the most part, however, the data in this section and the next came from telephone interviews with 405 journeymen in the nine unions studied, as indicated in Table 4. Attempts were made to use random samples of forty to fifty journeymen (whose telephone numbers were available) from each union. There were three exceptions to the sampling procedure:

(1) In Washington, the only carpenters interviewed were members of the piledrivers local, since the piledrivers and millwrights had been identified by the training director as the most common participants in the carpenters' welding program. (The millwrights local did not give permission to conduct interviews with its members.)

(2) The operating engineers in Washington had not participated in their upgrading program to anything like the extent (40 percent) suggested by the sample. This union, alone among those surveyed, had kept attendance records showing that only five percent of the members had taken part in upgrading. For that reason, separate samples were taken of participating and non-participating journeymen, in order to avoid the possibility of extracting a purely random sample that contained no upgraders.

(3) The carpenters sample in Miami is actually two samples. The first, comprised of men who had participated in the union's safety course, was taken from training center files early in the survey, when it appeared that a representative sample would not be forthcoming from the union; the second is a small sample obtained from the union late in the survey period. Unfortunately,

TABLE 4

Participation in Upgrading Programs, by Trade, Washington and Miami

Union	Sample Size	Participants in Upgrading (Percent)
Washington		
Carpenters	21	5 (24%)
Electricians	52	19 (37%)
Operating Engineers	58	23 (40%)
Plumbers	49	12 (24%)
Steamfitters	57	31 (54%)
Miami		
Carpenters	30	16 (53%)
Electricians	39	28 (72%)
Plumbers	48	23 (48%)
Pipefitters	51	30 (60%)
TOTAL	405	187 (46%)

SOURCE: Interviews with journeymen.

the sample of carpenters in Miami is probably not typical of that union as a whole, since half the interviewees were supervisors taking part in OSHA classes.

Clearly, the figure of 187 journeymen, or 46 percent of the total sample, overstates the extent of journeymen involvement in formal upgrading activities. A better estimate, based on known data regarding several trades, especially the operating engineers, is that between 25 and 35 percent of the journeymen in these nine unions have, at some time, participated in upgrading courses. However, the experiences of those who did participate were as important to this study as the actual extent of participation; it was from these journeymen's experiences that most of the information in this section was drawn.

Finally, since there were too many different courses taken by journeymen (see Table 3) to discuss each course separately, an arbitrary decision was made to discuss aspects of only the eleven individual courses that had been taken by at least ten journeymen. The category "other courses" includes around twenty separate offerings, some of which were taken by only one or two journeymen.

Growth of Upgrading over Time

As indicated in interviews with training directors, journeyman course offerings have increased significantly in the last fifteen to twenty years. Table 5 shows that only ten percent of the courses taken by sample journeymen were taken prior to 1960, compared with about 20 percent from 1960 to 1965, 30 percent from 1966 to 1970, and nearly 40 percent from 1971 to 1974. Evidently advanced training for journeymen has become an increasingly important part of the system of manpower training in construction, and, if the predictions of training directors and union officials are accurate, upgrading will be even more important in the future.

Course Organization

Several aspects of course organization were worthy of mention, though in some cases the interviewees' recall of course details may have been confused or faulty. These problems are noted in the discussion that follows.

Course Length. The most difficult problems arising from lack of recall involved the length of upgrading courses. There

TABLE 5

Years in Which Journeyman Upgrading Courses Were Taken

Course	Years Taken (Row Percentages in Parentheses)						
	1973-1974	1971-1972	1966-1970	1960-1965	before 1960	No Answer	Total
Welding	17(32%)	5(9%)	14(26%)	8(15%)	8(15%)	1(2%)	53
Refrigeration/ Air Conditioning	9(56%)	0	4(25%)	1(6%)	0	2(13%)	16
Air Conditioning/ Refrigeration Controls	1(6%)	2(12%)	5(29%)	6(35%)	3(18%)	0	17
Plumbing Code	2(14%)	4(29%)	4(29%)	2(14%)	1(7%)	1(7%)	14
Electrical Code	6(29%)	2(10%)	5(24%)	5(24%)	2(10%)	1(5%)	21
Electronics	0	0	8(57%)	3(21%)	3(21%)	0	14
Motor Controls	0	3(20%)	7(47%)	5(33%)	0	0	15
Tower Crane	8(62%)	2(15%)	2(15%)	1(8%)	0	0	13
Drafting	3(25%)	0	3(25%)	1(8%)	4(33%)	1(8%)	12
Blueprint Reading	0	2(18%)	2(18%)	6(55%)	1(9%)	0	11
Safety/First Aid	7(35%)	11(55%)	0	1(5%)	0	1(5%)	20
All Other Courses	11(13%)	16(19%)	34(40%)	16(19%)	6(7%)	10(3%)	86
TOTAL	64(22%)	47(16%)	88(30%)	55(19%)	28(10%)	10(3%)	292

SOURCE: Interviews with journeymen.

were so many journeymen who could not remember how long their courses lasted that no attempt has been made to reduce these data to tabular form. Most of the popular courses, it appears, were either one semester or one school year in length, meeting from two to four hours per week. However, some courses, such as safety and first aid, were much shorter (say, three to four weeks), while one electronics course lasted two years. Several welding programs had no specified length; journeymen attended when they wished and quit coming to class when they felt they had learned enough.

Format. The nature of most courses and the facilities available dictated a predominantly classroom format for upgrading programs. More than three-fourths of the courses taken by sample journeymen were taught either solely in the classroom as in combination classroom/shop or classroom/field settings (see Table 6). There were, of course, exceptions to the general pattern; of these the most notable were the welding courses, which must be taught in shops with hands-on training.

Table 6 shows that the most popular courses were of two sorts: (1) courses such as code, drafting, safety, which could hardly be taught outside a classroom setting; and (2) courses such as air conditioning/refrigeration, motor controls, electronics, and tower crane operation, which combined classroom instruction with practical training. By contrast, a small percentage of the least popular courses involved hands-on training. While there are undoubtedly many factors that influence participation in individual upgrading courses, it is tempting to infer that course format may be of some significance. Reinforcing this hypothesis was the common complaint from journeymen that their formal training in construction involved too much "book work" and not enough practical experience, at both the apprentice and journeyman level. One program in Miami was even moved to the union hall from its previous location at a high school, simply because many journeymen could not stand the thought of being in classrooms again. Given these attitudes, and also the fact that the more successful programs involved practical as well as theoretical training, perhaps an alteration in the format of some courses would increase participation.

Instructors. As Table 7 indicates, about two-thirds of the courses had been taught by union members, either rank and file journeymen or foremen, superintendents, or others in supervisory positions. Very few courses were taught by contractors, even though contractors surely should be able to

TABLE 6

Format of Journeyman Upgrading Courses

Course	Format (Row Percentages in Parentheses)							
	Classroom	Shop	OJT	Field	Combi-nation	Other	No Answer	Total
Welding	6(11%)	32(60%)	0	0	9(17%)	0	6(11%)	53
Refrigeration/ Air Conditioning	11(69%)	0	0	0	5(31%)	0	0	16
Air Conditioning/ Refrigeration Controls	8(47%)	1(6%)	0	0	8(47%)	0	0	17
Plumbing Code	13(93%)	0	0	0	0	0	1(7%)	14
Electrical Code	20(95%)	0	0	0	1(5%)	0	0	21
Electronics	7(50%)	0	0	0	7(50%)	0	0	14
Motor Controls	8(53%)	0	0	0	7(47%)	0	0	15
Tower Crane	2(15%)	0	2(15%)	1(8%)	8(62%)	0	0	13
Drafting	10(83%)	2(17%)	0	0	0	0	0	12
Blueprint Reading	10(91%)	0	0	0	1(9%)	0	0	11
Safety/First Aid	20(100%)	0	0	0	0	0	0	20
All Other Courses	53(62%)	14(16%)	4(5%)	1(1%)	6(7%)	4(5%)	3(3%)	85
TOTAL	168(58%)	49(17%)	6(2%)	2(1%)	52(18%)	4(1%)	10(3%)	291

SOURCE: Interviews with journeymen.

TABLE 7

Instructors in Journeyman Upgrading Courses

Course	Instructor (Row Percentages in Parentheses)							
	Another Journeyman	Super-visor	Union Official	Contrac-tors	Combi-nation	Other	No Answer	Total
Welding	30(57%)	2(4%)	5(9%)	0	1(2%)	11(21%)	4(8%)	53
Refrigeration/ Air Conditioning	9(56%)	1(6%)	0	2(13%)	0	4(12%)	0	16
Air Conditioning/ Refrigeration Controls	13(76%)	1(6%)	0	1(6%)	0	2(12%)	0	17
Plumbing Code	0	1(7%)	1(7%)	1(7%)	0	11(79%)	0	14
Electrical Code	9(43%)	2(10%)	1(5%)	0	1(5%)	8(38%)	0	21
Electronics	6(43%)	1(7%)	0	0	0	7(50%)	0	14
Motor Controls	10(67%)	5(33%)	0	0	0	0	0	15
Tower Crane	8(62%)	2(15%)	0	0	2(15%)	1(8%)	0	13
Drafting	4(33%)	0	0	0	0	6(50%)	2(17%)	12
Blueprint Reading	6(55%)	2(18%)	0	0	0	3(27%)	0	11
Safety/First Aid	6(30%)	7(35%)	1(5%)	0	0	5(25%)	1(5%)	20
All Other Courses	53(62%)	6(7%)	2(2%)	2(2%)	2(2%)	18(21%)	2(2%)	85
TOTAL	154(53%)	30(10%)	10(3%)	6(2%)	6(2%)	76(26%)	9(3%)	291

SOURCE: Interviews with journeymen.

teach many kinds of material in a job-relevant way. An unexpectedly large number (26 percent) of instructors were neither union members nor employers, but outsiders--typically local plumbing and electrical inspectors (for code classes) and certified welding instructors.

The ratio of journeymen to supervisors (53 percent to 10 percent) among instructors was surprisingly high, considering the statements of training directors to the effect that, to command the respect and attention of journeymen, instructors should be highly skilled tradesmen, preferably in supervisory positions. This discrepancy may be only apparent, since union members frequently are unaware of other members' positions. A journeyman who was unsure of whether his instructor had been working as a journeyman or as a supervisor would be likely to say, "He was just another man out of the local," or the equivalent. Such answers were coded in the "another journeyman" category, and probably biased the data against instructors who actually held supervisory positions.

Courses Offered with Apprentices. Practically all training directors advised against teaching classes containing both journeymen and apprentices, on the grounds that journeymen would not be willing to risk losing face if they did not perform as well as apprentices, and would therefore avoid courses in which apprentices took part. At the same time, however, it was not uncommon for advanced apprentices to be allowed to sit in on journeyman classes if they wished to do so. In fact, in about one-fourth of the courses surveyed, journeymen remembered apprentices as having taken part. Although apprentices did not take part in about two-thirds of the courses, there was no noticeable reluctance on the part of the journeymen to attend classes with apprentices; many could not even remember whether apprentices took part or not. The presence of apprentices in class, at least to these interviewees, did not seem to be as important as training directors believed. The responses of these journeymen would thus seem to belie the assertion that upgrading courses cannot be taught successfully if apprentices are present; they can be, and have been. Of course, attendance might have been better had apprentices not taken part, but the survey found no direct evidence to support such an assumption.

Sources of Information about Courses. Journeymen who participated in upgrading courses learned of their availability in a number of ways, chiefly through announcements at union

meetings and letters from the unions and/or joint apprenticeship and training committees (see Table 8). It was common practice for unions and JATC's to inform the members about courses that would be offered, and to solicit their participation and ideas for other possible course offerings. The journeymen interviewed identified most of these notices as having come from their unions, when many may, in fact, have been sent by the JATC's. This discrepancy is probably due to many members' image of unions and training programs as (almost) identical bodies.

Nine percent of the journeymen said they had heard about course offerings by word of mouth, from other journeymen and from supervisors. Only five percent said that their employers had approached them on the subject of upgrading, and half of these were for courses in safety, for which contractors had to have employees certified under OSHA. The relationship between contractors and upgrading programs is explored at the end of this section.

Reasons for Enrolling. Journeymen enrolled in upgrading courses for three major reasons: to learn how to use new products and/or processes, to acquire skills for which they had had no prior training, and to brush up on skills that had grown rusty through disuse. A breakdown of the reasons given for participating in each course is displayed in Table 9. According to these data, brushing up on old skills was relatively the most important motive for enrolling, especially for code, but also for refrigeration and air conditioning, blueprint reading and motor controls. Lack of previous instruction was next in importance, chiefly for the newer fields of electronics and tower crane operation. New products and new processes were comparatively minor in importance.

The numbers in Table 9 may obscure more than they reveal, however, chiefly because answers were forced to fit the above categories. There was no satisfactory way, for example, to classify a person's motive for taking a given course if the coursework was partially a review of prior instruction and partially training for new processes. It was difficult to classify workers who had had no previous formal training in a particular skill, but who had acquired the skill informally prior to taking journeyman upgrading courses in that skill area. The data in Table 9, thus, should be interpreted with caution, since they are themselves interpretations of more complex answers.

TABLE 8

Sources of Information about Upgrading Classes

Course	Principal Source of Information (Row Percentages in Parentheses)							
	Other Journeyman	Foreman	Employer	JATC	Union	Other	No Answer	Total
Welding	6(11%)	0	0	6(11%)	26(49%)	10(19%)	5(9%)	53
Refrigeration/ Air Conditioning	0	0	1(6%)	1(6%)	10(63%)	4(25%)	0	16
Air Conditioning/ Refrigeration Controls	1(6%)	0	0	1(6%)	14(82%)	1(6%)	0	17
Plumbing Code	1(7%)	0	0	5(36%)	7(50%)	0	1(7%)	14
Electrical Code	2(10%)	0	0	6(29%)	11(52%)	2(10%)	0	21
Electronics	0	0	0	7(50%)	6(43%)	1(7%)	0	14
Motor Controls	0	0	0	4(27%)	9(60%)	2(13%)	0	15
Tower Crane	4(31%)	0	1(8%)	2(15%)	4(31%)	1(8%)	1(8%)	13
Drafting	3(25%)	0	0	0	4(33%)	4(33%)	1(8%)	12
Blueprint Reading	0	0	0	1(9%)	9(82%)	0	1(9%)	11
Safety/First Aid	1(5%)	0	7(35%)	2(10%)	7(35%)	3(15%)	0	20
All Other Courses	5(6%)	2(2%)	5(6%)	17(20%)	44(52%)	8(9%)	4(5%)	85
TOTAL	23(8%)	2(1%)	14(5%)	52(18%)	151(52%)	36(12%)	13(4%)	291

SOURCE: Interviews with journeymen.

TABLE 9

Reasons for Enrolling in Upgrading Courses

Course	Reasons for Enrolling (Row Percentages in Parentheses)						
	Brush-up	New Product	New Process	No Prior Instruction	Other	No Answer	Total
Welding	17(32%)	0	7(13%)	11(21%)	9(17%)	9(17%)	53
Refrigeration/ Air Conditioning	5(31%)	1(6%)	3(19%)	5(31%)	2(13%)	0	16
Air Conditioning/ Refrigeration Controls	12(71%)	1(6%)	2(12%)	2(12%)	0	0	17
Plumbing Code	10(71%)	0	1(7%)	1(7%)	2(14%)	0	14
Electrical Code	16(76%)	0	1(5%)	2(10%)	1(5%)	1(5%)	21
Electronics	3(21%)	1(7%)	2(14%)	7(50%)	1(7%)	0	14
Motor Controls	9(60%)	0	1(7%)	3(20%)	1(7%)	1(7%)	15
Tower Crane	1(8%)	0	1(8%)	9(69%)	1(8%)	1(8%)	13
Drafting	5(42%)	0	1(8%)	3(25%)	3(25%)	0	12
Blueprint Reading	7(64%)	0	1(9%)	2(18%)	1(9%)	0	11
Safety/First Aid	5(25%)	0	1(5%)	4(20%)	10(50%)	0	20
All Other Courses	28(33%)	4(5%)	9(11%)	15(18%)	19(23%)	9(11%)	84
TOTAL	118(41%)	7(2%)	30(10%)	64(22%)	50(17%)	21(7%)	290

SOURCE: Interviews with journeymen.

Finally, a substantial proportion (17 percent) of respondents mentioned reasons that could not be forced into the four main categories. Some enrolled in safety courses in order to maintain their positions as foremen and superintendents. Others (in Miami) took welding courses in order to learn how to build swamp buggies, not to increase their job skills. And many could be pressed no further than to say that they "just wanted to improve [themselves]" or were "trying to stay up with the trade."

Completion of Courses. In more than four-fifths of the cases, journeymen had completed their coursework; dropouts occurred in only one course in seven, and in several courses no surveyed journeyman had dropped out. Welding had a non-completion rate of about 20 percent, due chiefly to the fact (as mentioned) that there was often no specified course of instruction, but rather individual coaching by instructors in shop situations. Since journeymen could enter and leave those programs as they pleased, many stopped attending before courses officially ended. Several journeymen left other courses because of family commitments and unforeseen work schedule changes; others had enrolled in order to acquire only particular skills, and dropped out after the acquisition of those skills.

Benefits and Shortcomings of Upgrading Courses

The journeymen who had taken part in upgrading programs were asked to identify the strong and weak points of the courses they took, as well as the benefits they derived from having participated. Their answers are discussed below.

Effect on Employability. The vast majority (71 percent) of journeymen who took part in upgrading courses felt that their coursework had increased their ability to hold a variety of jobs, while only 19 percent felt that their employability had not increased (see Table 10). This pattern of response was consistent, except for courses in safety and first aid, which were taught in order to satisfy OSHA requirements, rather than to increase productivity directly. Welding, a widely applicable skill, was only average in its effects on employability, perhaps because many journeymen took welding courses for non-job-related purposes.

Obviously, this kind of evaluation of the effects of upgrading on employability is highly subjective; it would have been preferable to develop an objective means of measuring the

TABLE 10

Effects of Upgrading on Employability

Course	Effect on Employability				
	Increased	No Effect	Don't Know	No Answer	Total
Welding	38(72%)	9(17%)	3(6%)	3(6%)	53
Refrigeration/ Air Conditioning	11(69%)	4(25%)	0	1(6%)	16
Air Conditioning/ Refrigeration Controls	12(71%)	5(29%)	0	0	17
Plumbing Code	9(64%)	4(29%)	1(7%)	0	14
Electrical Code	17(81%)	2(10%)	1(5%)	1(5%)	21
Electronics	8(57%)	3(21%)	1(7%)	2(14%)	14
Motor Controls	13(87%)	1(7%)	0	1(7%)	15
Tower Crane	12(92%)	1(8%)	0	0	13
Drafting	9(75%)	0	3(25%)	0	12
Blueprint Reading	8(73%)	3(27%)	0	0	11
Safety/First Aid	7(35%)	12(60%)	1(5%)	0	20
All Other Courses	64(75%)	11(13%)	4(5%)	6(7%)	85
TOTAL	208(71%)	55(19%)	14(5%)	14(5%)	291

SOURCE: Interviews with journeymen.

employment effects of upgrading. To do so, however, would have involved a number of important conceptual problems:

(1) The best measure of the effects of training on employability would have been a comparison of hours worked (and thus, total employment and earnings) by participants and non-participants in upgrading courses, controlling for age, apprenticeship background, and experience. Such a measure could have been developed, but since participants took from one to six courses, it would have been difficult even to define "participant." There might have been more difference in total training, for example, between a participant in five courses and a participant in one course, than between a participant in one course and a non-participant.

(2) Because courses varied widely in the kinds of skills imparted, some courses--say, tower crane operation--might have had an immediate and obvious impact on their participants' employment, while others--notably safety and first aid--might not have affected hours worked at all. Workers with comparable numbers of courses behind them might often be non-comparable in terms of the job skill improvement that took place in their respective courses.

(3) Employment and employability are not the same thing. A worker who took a welding course might have increased his employability, but if the kinds of work available to him did not require welding skills, his employment would not have increased. If anything, an objective measure of increased employment might understate increases in employability--perhaps substantially--without providing a clue as to the size of the error.

(4) Finally, at the time of the survey and for many years previous, employment in the construction trades in Miami and Washington had been so brisk that the employment differentials between journeymen with different skill endowments might have been quite small. When the labor market is tight, even poorly trained workers can usually find full-time work; thus it probably would have been fruitless to search for a significant hours-worked differential between upgraders and other journeymen.

Given the sizes of journeymen samples in this study, the difficulties enumerated above prevented the construction of a meaningful objective measure of the effects of upgrading on

employment. To control for apprenticeship background, experience, and other personal characteristics as well as for the kind and number of courses taken would have required much larger samples for the statistics generated to have been meaningful. (As it was, twice as many journeymen were contacted as were envisioned in the original proposal.) An objective measure should be developed, but the scope of the project did not permit its development.

Effect on Promotions. As Table 11 indicates, only 15 percent of the journeymen said that they had received promotions to supervisory positions as a result of taking upgrading courses, while 70 percent had not been promoted explicitly because of their upgrading activities. This finding does not mean that upgrading seldom increases promotability; rather, as will be shown later, it is a reflection of the fact that most employers did not know whether or not their employees had taken part in upgrading. In fact, as is discussed in Section III, journeymen with some upgrading experience had worked slightly more often in supervisory positions than had other journeymen, though the difference was not great enough to imply a causal relationship between upgrading courses and promotions.

Recommendations to Other Journeymen. To measure journeymen's satisfaction with the courses they had taken, the respondents were asked whether they would recommend the courses to other journeymen. An overwhelming majority (88 percent) said they would recommend their courses to interested journeymen, while only three percent would not have done so. Responses to this and other questions concerning course quality were sometimes extremely enthusiastic:

> [They are] quite outstanding courses, really. It's a shame you can't take more than one a year, but with work, family life, and such, it is hard. I try to go once a year.
>
> There's no substitute for expanding one's knowledge. In electrical work products change rapidly; new ones come on the market. [Journeyman upgrading] courses are greatly beneficial. It stimulated me to learn on my own.
>
> Every man should take a refresher course every two years. They should be mandatory.[8]

[8] Interviews with journeymen, Miami and Washington.

TABLE 11

Effects of Upgrading on Promotion

Course	Promotions Received Because of Course Work				
	Yes	No	Don't Know	No Answer	Total
Welding	3(6%)	43(81%)	3(6%)	4(8%)	53
Refrigeration/ Air Conditioning	2(13%)	13(81%)	0	1(6%)	16
Air Conditioning/ Refrigeration Controls	4(24%)	11(65%)	2(12%)	0	17
Plumbing Code	3(21%)	8(51%)	3(21%)	0	14
Electrical Code	3(14%)	13(62%)	3(14%)	2(10%)	21
Electronics	2(14%)	9(64%)	1(7%)	2(14%)	14
Motor Controls	2(13%)	10(67%)	2(13%)	1(7%)	15
Tower Crane	1(8%)	12(92%)	0	0	13
Drafting	2(17%)	9(75%)	1(8%)	0	12
Blueprint Reading	2(18%)	6(55%)	2(18%)	1(9%)	11
Safety/First Aid	1(5%)	17(85%)	0	2(10%)	20
All Other Courses	18(21%)	53(62%)	7(8%)	7(8%)	85
TOTAL	43(15%)	204(70%)	24(8%)	19(7%)	291

SOURCE: Interviews with journeymen.

In sum, the participating journeymen obviously felt that they had profited from their upgrading experiences.

Strong and Weak Points of Upgrading Courses. Journeymen were asked to identify, if possible, the specific aspects of their courses--instructors, format, relevance to their jobs, materials used, etc.--that they felt were either particularly good or that could stand substantial improvement. Though enlightening in a general way, the answers did not indicate any overriding reason for changing journeyman training; for all courses taken together, there was no single attribute of upgrading that more than a very few journeymen felt should be improved. Two-thirds of the respondents either provided no useful answer to questions about the weak points of courses, or said their courses had no weak points at all.

Concerning the courses' strong points, the journeymen were somewhat more specific. As Table 12 shows, the aspects of upgrading courses that were considered best were the instructors and the relevance of course offerings to job situations. Over one-fourth of the interviewees thought that all aspects of their courses were strong, compared with only three percent who thought their courses had no strong points. Twenty percent did not answer the question. Apparently the journeymen who had participated in upgrading programs were satisfied with the form and substance, as well as the results, of the courses in which they had taken part.

Inputs from Contractors

On the assumption that employers of upgrading participants would be valuable sources of information about the extent and effectiveness of upgrading efforts, 99 contractors were questioned about their knowledge and opinions of upgrading efforts. The contractors giving information operated in the following general and specialty areas:

Washington		Miami	
General Contractors	16	General Contractors	17
Electrical Contractors	14	Electrical Contractors	14
Mechanical Contractors	15	Mechanical Contractors	16
Excavating/Grading Contractors	7		
TOTAL	52	TOTAL	47

TABLE 12

Strong Points of Upgrading Courses, as Evaluated by Journeymen

Course	Strong Points of Courses (Row Percentages in Parentheses)					
	Instructor	Materials	Organization	Job Relevance	Format	Other
Welding	10(19%)	1(2%)	1(2%)	9(17%)	2(9%)	2(4%)
Refrigeration/ Air Conditioning	2(13%)	2(13%)	1(6%)	0	1(6%)	0
Air Conditioning/ Refrigeration Control	0	0	1(6%)	4(24%)	0	1(6%)
Plumbing Code	3(21%)	0	0	1(7%)	0	2(14%)
Electrical Code	8(38%)	1(5%)	0	4(19%)	0	2(10%)
Electronics	5(36%)	0	0	2(14%)	0	0
Motor Controls	4(27%)	0	0	2(13%)	1(7%)	1(7%)
Tower Crane	2(15%)	0	4(31%)	0	0	1(8%)
Drafting	2(17%)	1(8%)	0	5(42%)	0	0
Blueprint Reading	2(18%)	0	0	2(18%)	0	1(9%)
Safety/First Aid	1(5%)	2(10%)	0	0	4(20%)	2(10%)
All Other Courses	12(14%)	3(3%)	2(2%)	10(12%)	1(1%)	3(3%)
TOTAL	51(17%)	10(3%)	9(3%)	39(13%)	9(3%)	15(5%)

SOURCE: Interviews with journeymen.

TABLE 12 (cont.)

Strong Points of Upgrading Courses, as Evaluated by Journeymen

Course	Strong Points of Courses (Row Percentages in Parentheses)				
	More Than One Strong Point	All Points Were Strong	No Points Were Strong	No Answer	Total
Welding	1(2%)	17(32%)	3(6%)	7(13%)	53
Refrigeration/ Air Conditioning	1(6%)	5(31%)	1(6%)	3(19%)	16
Air Conditioning/ Refrigeration Control	1(6%)	6(35%)	0	4(24%)	17
Plumbing Code	3(7%)	3(21%)	2(14%)	2(14%)	14
Electrical Code	1(5%)	2(10%)	0	3(14%)	21
Electronics	0	2(14%)	1(7%)	4(29%)	14
Motor Controls	0	3(20%)	0	4(27%)	15
Tower Crane	1(8%)	5(39%)	0	0	13
Drafting	0	3(25%)	0	1(8%)	12
Blueprint Reading	0	1(9%)	1(9%)	4(36%)	11
Safety/First Aid	0	9(45%)	0	2(10%)	20
All Other Courses	2(2%)	26(31%)	1(1%)	25(29%)	85
TOTAL	8(3%)	82(28%)	9(3%)	59(20%)	291

SOURCE: Interviews with journeymen.

Somewhat surprisingly, the only significant thing learned from these interviews--and one of the principal findings of the study--was that contractors knew almost nothing about upgrading programs available to their employees, the extent to which their employees had participated, or the benefits of upgrading to journeymen or contractors. The dimensions of contractors' knowledge of and contributions to the upgrading system can be summarized briefly:

(1) Of the 99 contractors interviewed, 20 were unaware that upgrading programs existed. Of these, twelve were general contractors; the specialty subcontractors were generally better informed, partly because upgrading was better established in their crafts, but also because many of them were former journeymen and thus knew more about training opportunities for journeymen. This phenomenon was further illustrated by the fact that the electrical contractors were by far the most knowledgeable about specific courses being offered to journeymen, while practically none of the general contractors knew that any courses besides OSHA/safety classes were being offered. Only one excavating contractor in Washington knew about the heavy equipment courses available to operating engineers, and he was a member of the industry's JATC.

(2) Of the 79 contractors who knew about upgrading classes, 15 said they did not know whether their journeymen had taken part; 15 others said they did not think their employees had participated, but most admitted that their actual knowledge of the matter was quite sketchy.

(3) Of the 49 contractors who were sure that their employees had taken upgrading classes, 13 did not know which courses the journeymen had taken. The other 36 knew little about participants in classes besides code, welding, and safety (the most common courses taken by journeymen). The contractors had but scattered information about participation in other courses.

(4) Twenty-eight contractors (only three of whom were general contractors) had taken upgrading courses themselves, and two had taught journeyman courses in years past. The majority of contractors claimed to encourage their employees to take advantage of these opportunities, usually by putting notices in journeymen's paychecks or by having supervisors advise other employees about courses being offered. As shown earlier in this section, though, the effects of contractor persuasion were limited; few journeymen had participated in

upgrading courses at the behest of their employers or supervisors.

(5) Though the majority of contractors knew little or nothing about the upgrading system being paid for with their money,[9] most thought the courses were beneficial and improved journeymen's employability; not one employer, however, said that he had promoted journeymen because of their upgrading activities. Most perplexing was the contractors' almost unanimous agreement with the idea, voiced by training directors, that the journeymen who most needed to upgrade their skills were those who were least likely to do so. While there are logical grounds for agreeing with this assertion, these contractors' first-hand knowledge of the upgrading activities by journeymen simply did not support such a conclusion. The contractors interviewed in this study knew so little about the actual workings of the upgrading system that their opinions concerning the types of journeymen who are likely to take part in upgrading can be based only on guesswork, as numerous contractors were quick to admit.

In spite of a lack of usable input from employers, the survey phase of the study developed a good bit of information about numerous aspects of upgrading courses, including, it was felt, useful ideas for improving the classes and enhancing their attractiveness to journeymen; these ideas are developed in the concluding section of this report. The survey also revealed much interesting information about the journeymen themselves, and it is this information which is the subject of the following section.

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[9]Training funds for apprenticeship and journeyman programs are provided by contractors, at a negotiated number of cents-per-man-hour worked, under the terms of each collective bargaining agreement.

III. PROFILE OF PARTICIPANTS IN JOURNEYMAN UPGRADING PROGRAMS

Besides describing the content and characteristics of journeyman upgrading programs, the study was intended to provide a profile of participating journeymen, to be compared with non-participants in order to examine the characteristics of each group that led to or discouraged their taking part in these activities. In this way, suggestions could be made about means by which upgrading programs could appeal to greater numbers of workers and play a more important role in skill retention and improvement.

This aim of the project was suggested, in part, by comments made by training directors and contractors, almost all of whom believed that many journeymen enrolled in upgrading were highly skilled and needed little training, while the journeymen most in need of retraining would not attend classes. Several reasons were adduced to support this allegation, including two in particular: (1) Upgraders were highly motivated to improve their skills, and would have found some way to do so even in the absence of upgrading classes; those who were least apt to upgrade themselves were also likely to be too lazy to attend classes. (2) Journeymen with inferior skill endowments would be embarrassed by their shortcomings, and would rather not attend classes than lose face before other journeymen.

Other statements made by training officials led to the belief that participation in journeyman courses was significantly related to age and prior training. One training director said that it was hopeless to offer courses to journeymen over forty years old, because at their ages, they were not interested in going back to school. Several industry spokesmen said that most upgrading participants were apprenticeship graduates who, being used to classroom training, would feel little trepidation about going back into similar situations as journeymen. A related issue, though one not raised by training directors, was the likehood of recent apprenticeship graduates' returning to classes soon after they become journeymen; one might suppose such workers to be current in their fields for several years, and thus less likely to attend refresher courses.

The only significant differences between participating and non-participating journeymen were in their apprenticeship

backgrounds and length of time as union members. Otherwise, there did not seem to be much difference in the personal characteristics and training backgrounds of upgraders and non-upgraders. These results were unexpected, but surprisingly consistent among trades; they are summarized below.

Age

For all trades taken together, there was no significant difference between the age distributions of journeymen who had taken part in upgrading and those who had not (a pattern which was noticeable with respect to other personal characteristics, as is shown throughout this section). As Table 13 indicates, the only real difference between the two groups occurs in the 36-45 age bracket, which account for 35 percent of participants but only 27 percent of non-participants. This was due in part to the fact that the journeymen took 65 percent of their coursework between the ages of 26 and 40 (see Table 14). The lag between the time when courses were taken and the time of the survey helps to account for a marginally higher percentage of participants than non-participants in the 36-45 age range, but it does not explain very much about the similarities in other age groups.

Table 14 does seem to bear out the contention of the training director who said it was a waste of time to try to persuade journeymen over 40 to enroll in upgrading. Only one-fourth of the upgrading courses were taken by men over 40 years old, and a substantial number of those were men in supervisory positions who had to qualify in safety training under OSHA. This phenomenon is understandable, for several reasons. The most obvious (to a human capital economist, anyway) is that the stream of earnings resulting from skill acquisition is increased much less over the remaining work-life of a 40-year old worker than for a 25-year old; thus, the older the worker, the less likely the payoff from upgrading will be to outweigh the opportunity costs of coursework. Other explanatory factors include the increasing difficulty of adjusting to training as a worker grows older, and the fatigue that is most likely to overcome older workers at the end of a work day, when nearly all classes begin.

Formal Education

Journeymen who had participated in upgrading courses were, on the whole, marginally better educated than the other journeymen in the survey; one-fourth of the upgraders had

TABLE 13

Ages of Participants and Non-Participants
in Journeyman Upgrading Programs

	Age Ranges				
	18-25	26-35	36-45	46-55	over 55
Participants					
Washington	2	41	28	14	5
Miami	1	21	38	17	19
Total (186)	3(2%)	62(33%)	66(35%)	31(17%)	24(13%)
Non-Participants					
Washington	7	59	37	26	18
Miami	1	19	21	17	12
Total (217)	8(4%)	78(36%)	58(27%)	43(20%)	30(14%)
Total = 403	11	140	124	74	54

SOURCE: Interviews with journeymen.

TABLE 14

Ages at Which Journeymen Participated in Upgrading Courses, by Trade

	Age Ranges					
	under 25	26-30	31-35	36-40	41-45	over 45
WASHINGTON						
Carpenters	0	4	1	0	0	0
Electricians	3	5	7	5	1	2
Operating Engineers	7	9	2	3	2	2
Plumbers	0	4	2	2	3	2
Steamfitters	7	6	10	9	5	2
MIAMI						
Carpenters *mostly OSHA	0	2	2	5	0	8*
Electrician	4	13	7	4	3	11
Plumbers	1	3	2	3	7	2
Pipefitters	0	18	11	4	5	2
TOTALS = 222	22	64	44	35	26	31
(100%)	(10%)	(29%)	(20%)	(16%)	(12%)	(14%)

SOURCE: Interviews with journeymen.

had at least some college, compared with one-fifth of the other journeymen. However, as Table 15 shows, for all trades about three-fourths of all journeymen in the sample had had from nine to twelve years of school.

It was expected that journeymen with superior educational attainments would be more likely to participate in upgrading programs than would other journeymen. Better educated workers would tend to possess more advanced verbal and quantitative skills, and thus be better prepared for some advanced courses than less well educated men. Further, having spent more years in school, the better educated workers might be expected to feel more comfortable in a classroom learning situation. Though the educational backgrounds of surveyed journeymen lend some credence to this hypothesis, the wide dispersion in educational attainments of participants and non-participants by trade (see Table 16) shows clearly that there was no consistent, much less significant, relationship between years of formal schooling and participation in upgrading courses among the sample journeymen.

Apprenticeship Background

One of the most important hypotheses to be tested was that most journeyman upgraders were graduates of union apprenticeships. Table 17 indicates that, although the percentages of upgraders who graduated from apprenticeship programs were not as overwhelming as had been suspected, substantial majorities of upgrading participants in most unions were former apprentices. More significantly, upgraders were substantially more likely to have served apprenticeships than non-participants: 63 percent of all upgrading participants were apprenticeship graduates, compared with only 55 percent of the other journeymen.

Table 18 demonstrates that the relationship between apprentice training and journeyman upgrading participation is even stronger than it appears in Table 17. Fifty-one percent of former apprentices with over two years experience as journeymen had taken part in upgrading courses, compared with only 36 percent of former apprentices with less than two years as journeymen. This finding supports the hypothesis that recent graduates from apprenticeship programs do not need refresher courses immediately, since their skills are still up to date. And, as a plumber in Washington said--not knowing how many other journeymen he spoke for--"Right now I feel, since I just completed my apprenticeship recently, that I know the things and I don't want to go to school again so soon."

TABLE 15

Years of Formal Education of Participants and Non-Participants in Journeyman Upgrading Programs

	Years of Formal Schooling					
	0-6	7-8	9-11	12	13-15	16 or more
Participants						
Washington	0	2	19	50	18	1
Miami	1	2	13	57	24	0
Total Participants (187)	1(1%)	4(2%)	32(17%)	107(57%)	42(23%)	1(1%)
Non-Participants						
Washington	1	4	26	92	23	1
Miami	1	8	7	38	16	1
Total Non-Participants (218)	2(1%)	12(6%)	33(15%)	130(60%)	39(18%)	2(1%)
Total Sample:405	3	16	65	237	81	3

SOURCE: Interviews with journeymen.

TABLE 16

Educational Attainment of Participants and Non-Participants in Journeyman Upgrading Programs, by Trade

			Years of Formal Education		
			0-11	12 (high school equivalent)	more than 12
WASHINGTON					
Carpenters	Participants	(5)	3(60%)	2(40%)	0
	Non-Participants	(16)	4(25%)	11(70%)	1(5%)
Electricians	Participants	(19)	1(5%)	12(63%)	6(32%)
	Non-Participants	(33)	3(9%)	22(67%)	8(24%)
Operating Engineers	Participants	(23)	8(35%)	10(43%)	5(22%)
	Non-Participants	(35)	14(40%)	16(46%)	5(14%)
Plumbers	Participants	(12)	1(8%)	7(58%)	4(33%)
	Non-Participants	(37)	5(13%)	27(73%)	5(13%)
Steamfitters	Participants	(31)	8(26%)	19(61%)	4(13%)
	Non-Participants	(26)	5(24%)	16(52%)	5(24%)
MIAMI					
Carpenters	Participants	(16)	3(19%)	10(62%)	3(19%)
	Non-Participants	(14)	5(36%)	5(36%)	4(28%)
Electricians	Participants	(28)	1(3%)	16(57%)	11(40%)
	Non-Participants	(11)	3(27%)	7(64%)	1(9%)
Plumbers	Participants	(23)	5(22%)	14(60%)	4(17%)
	Non-Participants	(25)	4(16%)	16(64%)	5(20%)
Pipefitters	Participants	(30)	7(23%)	17(57%)	6(20%)
	Non-Participants	(21)	4(19%)	10(48%)	7(33%)
All Participants		(187)	37(20%)	107(57%)	43(23%)
All Non-Participants		(218)	47(22%)	130(59%)	41(19%)

SOURCE: Interviews with journeymen.

TABLE 17

Apprenticeship Backgrounds of Participants and Non-Participants in Journeyman Upgrading Programs, by Trade

	Total in Sample	Number Who Served Apprenticeships (Percent)
Washington		
Carpenters		
Participants	5	0 (0%)
Non-Participants	16	1 (6%)
Electricians		
Participants	19	15 (80%)
Non-Participants	33	22 (67%)
Operating Engineers		
Participants	23	16 (70%)
Non-Participants	35	13 (37%)
Plumbers		
Participants	12	6 (50%)
Non-Participants	37	29 (78%)
Steamfitters		
Participants	31	22 (71%)
Non-Participants	26	20 (77%)
Miami		
Carpenters		
Participants	16	5 (31%)
Non-Participants	14	4 (29%)
Electricians		
Participants	28	24 (86%)
Non-Participants	11	7 (64%)
Plumbers		
Participants	23	14 (61%)
Non-Participants	25	16 (64%)
Pipefitters		
Participants	30	18 (60%)
Non-Participants	21	7 (33%)
TOTAL SAMPLE: Participants	187	120 (63%)
Non-Participants	218	119 (55%)

SOURCE: Interviews with journeymen.

TABLE 18

Apprenticeship Backgrounds of Participants and Non-Participants in Journeyman Upgrading Programs, by Length of Time in Journeyman Status

	Years in Journeyman Status	
	0-2	more than 2
Apprenticeship Graduates		
Participants	9(36%)	108 (51%)
Non-Participants	16(64%)	103 (49%)
	25(100%)	211(100%)
Nonapprentices		
Participants	3(75%)	62 (39%)
Non-Participants	1(25%)	96 (61%)
	4(100%)	158(100%)

SOURCE: Interviews with journeymen.

Former apprentices participated in upgrading for slightly different reasons from those mentioned by nonapprentices. Forty-three percent of apprenticeship graduates said their principal motive for taking upgrading classes was to brush up on old skills; only 19 percent had had no previous instruction in the skills being taught. By comparison, only 37 percent of nonapprentices were brushing up, while 26 percent were being instructed for the first time. While all reservations about these response categories still apply (see Section II), one is entitled to conclude that former apprentices tend to participate in upgrading primarily to review materials they had previously learned. Journeymen without apprentice training on the other hand, were relatively more concerned with learning new skills, many of which they could have acquired had they served apprenticeships.

Tenure in Journeyman Status

Workers who had taken part in upgrading courses had been journeymen somewhat longer than non-participants. As Table 19 demonstrates, nearly one-fourth of non-participants, but fewer than one-fifth of upgraders, had been journeymen less than five years. This result was not surprising; one would expect that the longer a worker had had upgrading opportunities available to him, the more likely he take advantage of them at some time. And, as seen earlier, newly-graduated apprentices were less disposed to take part because their skills were current; as time passed, they returned to classes.

A closer look at these data by trade, however (Table 20), shows a highly irregular relationship between years of journeyman tenure and upgrading activity. Of special concern are the data for carpenters in Miami: 15 of the 16 participants had been journeymen more than five years, but most of the participants were supervisors taking safety courses rather than skill training. If this atypical union were deleted from the total sample, the journeyman experience distributions for participants and non-participants would coincide even more closely than they do in Table 19. Thus, though it may be reasonable to assume that participation in upgrading should be positively correlated with journeyman experience, it would be risky to make that conclusion from this information.

Supervisory Experiences of Journeymen

Journeymen who had taken upgrading courses worked as supervisors (foremen, superintendents) slightly more often than other journeymen. Thirty-four percent of upgraders

TABLE 19

Years of Experience as Journeymen, for Participants and Non-Participants in Journeyman Upgrading Programs

	Years of Journeyman Experience			
	0-2	3-5	6-10	More than 10
Participants				
Washington	10	9	25	46
Miami	3	11	22	58
Total = 184	13 (7%)	20 (11%)	47 (26%)	104 (56%)
Non-Participants				
Washington	10	22	38	77
Miami	7	10	12	42
Total = 218	17 (8%)	32 (5%)	50 (23%)	119 (55%)
Total Sample=402	30 (7%)	52 (13%)	97 (24%)	223 (55%)

SOURCE: Interviews with journeymen.

TABLE 20

Years of Experience as Journeymen, for Participants and Non-Participants in Journeyman Upgrading Programs, by Trade

			Years of Journeyman Experience			
			0-2	3-5	6-10	more than 10
WASHINGTON						
Carpenters	Participants	(5)	2	2	0	1
	Non-Participants	(16)	0	4	5	7
Electricians	Participants	(19)	1	2	4	12
	Non-Participants	(33)	2	0	5	26
Operating Engineers	Participants	(23)	4	3	9	7
	Non-Participants	(35)	1	4	12	18
Plumbers	Participants	(12)	0	0	4	8
	Non-Participants	(37)	3	9	9	16
Steamfitters	Participants	(31)	3	2	8	18
	Non-Participants	(26)	4	5	7	10
Total, Washington = 237			20	31	63	123
MIAMI						
Carpenters	Participants	(16)	0	0	15	1
	Non-Participants	(14)	2	3	3	6
Electricians	Participants	(25)	1	3	2	19
	Non-Participants	(11)	1	3	1	6
Plumbers	Participants	(23)	1	2	3	17
	Non-Participants	(25)	2	3	7	13
Pipefitters	Participants	(30)	1	6	2	21
	Non-Participants	(21)	2	1	1	17
Total, Miami = 165			10	21	34	100
TOTAL, Both Cities = 402			30	52	97	223

SOURCE: Interviews with journeymen.

worked solely as supervisors, compared with 31 percent of non-participants; and only 27 percent of upgraders said they never worked as supervisors, compared with 33 percent of non-participants. This information, presented in Tables 21 and 22, might indicate that upgrading is likely to lead to advancement.

Other plausible interpretations exist, however, since opportunity for supervisory work is a function of all types of training (including apprenticeship and informal training), length of time in the trade, and natural leadership ability. Previous research[10] has correlated construction apprenticeship training with advancement into supervisory jobs, and the present study has linked both apprenticeship background and time in trade with participation in upgrading programs. Thus, to infer a significant relationship between upgrading and promotion would be to ignore other causal factors in promotion. Finally, as noted previously, many carpenters who took upgrading courses in Miami were supervisors qualifying under OSHA in order to hold their positions. In their cases, one could argue that supervisory work leads to upgrading participation, rather than the reverse.

Other Upgrading Activities

Most of the surveyed journeymen had taken steps to upgrade their skills outside of union journeymen classes. By far the most common means of nonunion upgrading activity was reading in trade manuals and journals, equipment manuals, and code books; more than four-fifths of upgrading participants and non-participants indicated that they did such reading on a more or less regular basis. Much less common, though still significant, were trade-related courses at local vocational schools and at local universities or community colleges; nearly twice as many upgraders as non-upgraders had furthered their training by these means (see Table 23). Finally, some unions allowed members of other unions to enroll in their upgrading classes, but only seven interviewees had done so.

Regression Analysis

A multiple regression model was constructed to summarize the influence of the aforementioned characteristics of journeymen, as well as other possibly important traits, on the extent

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[10]Marshall et al, Training and Entry into Union Construction, op. cit., Ch. V.

TABLE 21

Supervisory Experience of Participants and Non-Participants in Journeyman Upgrading Programs

	Percentage of Time Spent in Supervisory Positions					
	100%	75%	50%	25%	10%	0
Participants						
Washington	27	5	3	7	9	38
Miami	36	10	13	9	16	12
Total (185)	63(34%)	15(8%)	16(9%)	16(9%)	25(13%)	50(27%)
Non-Participants						
Washington	42	12	9	13	10	61
Miami	26	7	8	10	8	12
Total (218)	68(31%)	19(9%)	17(8%)	23(11%)	18(8%)	73(33%)
Total (403)	131(33%)	34(8%)	33(8%)	39(10%)	43(11%)	123(30%)

SOURCE: Interviews with Journeymen.

TABLE 22

Supervisory Experience of Participants and Non-Participants in Journeyman Upgrading Programs, by Trade

			Percentage of Time Spent in Supervisory Positions					
			100%	75%	50%	25%	10%	0
WASHINGTON								
Carpenters	Participants	(5)	1	1	0	2	0	1
	Non-Participants	(16)	6	1	0	1	1	7
Electricians	Participants	(19)	9	3	2	1	2	2
	Non-Participants	(33)	9	6	4	4	4	6
Operating Engineers	Participants	(23)	2	0	0	1	1	19
	Non-Participants	(35)	7	2	0	4	1	21
Plumbers	Participants	(12)	3	1	0	2	0	6
	Non-Participants	(37)	13	2	4	2	2	14
Steamfitters	Participants	(30)	12	0	1	1	6	0
	Non-Participants	(26)	7	1	1	2	2	13
Total, Washington = 236			69	17	12	20	19	99
MIAMI								
Carpenters	Participants	(16)	9	3	1	0	1	2
	Non-Participants	(14)	4	2	2	1	2	3
Electricians	Participants	(27)	7	5	5	4	4	2
	Non-Participants	(11)	4	0	2	1	1	3
Plumbers	Participants	(23)	11	1	3	0	3	5
	Non-Participants	(25)	9	3	2	4	3	4
Pipefitters	Participants	(30)	9	1	4	5	8	3
	Non-Participants	(21)	9	2	2	4	2	2
Total, Miami = 167			62	17	21	19	24	24
TOTAL, BOTH CITIES = 403			131	34	33	39	43	123

SOURCE: Interviews with journeymen.

TABLE 23

Other Upgrading Activities of Participants and Non-Participants in Journeyman Upgrading Programs, By Trade

	Percentage of Each Group Participating in Non-JATC-Sponsored Upgrading Efforts			
	Classes Offered by Other Unions	Classes In Vocational Schools	Classes In Local Colleges	Reading Trade Manuels and Journals
Washington				
Carpenters				
Participants	0	0	0	40%
Non-Participants	0	6%	0	81%
Electricians				
Participants	0	17%	11%	100%
Non-Participants	3%	12%	16%	94%
Operating Engineers				
Participants	0	23%	9%	86%
Non-Participants	0	12%	0	88%
Plumbers				
Participants	0	8%	17%	58%
Non-Participants	0	14%	8%	84%
Steamfitters				
Participants	0	27%	13%	90%
Non-Participants	0	12%	4%	88%
Miami				
Carpenters				
Participants	0	31%	31%	81%
Non-Participants	0	7%	7%	64%
Electricians				
Participants	8%	20%	12%	83%
Non-Participants	9%	9%	9%	73%
Plumbers				
Participants	5%	27%	10%	71%
Non-Participants	0	12%	8%	88%
Pipefitters				
Participants	3%	10%	17%	87%
Non-Participants	5%	10%	26%	86%
ALL UNIONS				
Participants	2%	20%	14%	83%
Non-Participants	1%	11%	8%	85%

SOURCE: Interviews with journeymen.

of participation in journeyman upgrading programs. The number of courses taken by journeymen (dependent variable) was regressed against seven independent variables--age, years of formal experience, apprenticeship background, years of journeyman experience, supervisory experience, and two additional variables. The first of these was the number of formal and informal training sources claimed by journeymen, including work in non-union shops, work in helper or laborer positions, training in military or vocational schools, exposure to the trade by friends and relatives. This variable was included in order to evaluate the possible effects of non-union sources of training. The second was the number of dependents in journeymen's families, included on the assumption that the number of mouths to feed may influence a person's appetite for training and increased income.

For each union and for the total sample, then, a regression equation was construction, of the form

$$NCRS = a + bAGE + cDEP + dEDUC + eAPP + fYRSJ + gSUPE + hOFIT$$

where NCRS = number of upgrading courses taken, AGE = age at time of interview, DEP = number of dependents, EDUC = years of formal education, APP = dummy for apprenticeship, YRSJ = years worked as a journeyman, SUPE = percentage of time spent in supervisory positions, and OFIT = number of other formal and informal sources received by interviewees. The results of the regression analysis are displayed in Table 24, and they reflect the phenomena discussed earlier in this section. For the entire sample there were only two variables with significant coefficients--apprenticeship background (.10 level) and years of journeyman experience (.05 level), and the latter is subject to considerable doubt, as discussed earlier. The significant positive coefficient for apprenticeship background does support the hypothesis that former apprentices are more likely to participate in upgrading, and to a greater extent, than other journeymen.

A glance at the statistics for individual unions reveals a chaotic array of mostly insignificant coefficients; even the signs are not systematically related. For two unions, the Miami carpenters and Washington electricians, no variable had a significant coefficient. In short, very little can be said about the relationship between a number of independent variables, any of which might well be thought explanatory, and the dependent variable (number of journeyman courses taken) that they were supposed to explain. Except for apprenticeship

TABLE 24

Matrix of Regression Coefficients for Factors Influencing Participation in Upgrading Courses (t-values given in parentheses)

	Age	Number of Dependents	Years Formal Education	Apprenticeship Background	Years a Journeyman	Percentage of Time Spent As Supervisor	Other Formal and Informal Training
TOTAL SAMPLE	-.009(-.153)	.033(1.023)	.070(1.091)	.191(1.864)*	.146(2.302)**	.012(.484)	-.011(-.324)
MIAMI							
Carpenters	.096(.406)	-.020(-.212)	.016(.131)	.536(1.507)	.107(.496)	.080(1.042)	.051(.409)
Electricians	.119(.384)	-.068(-.358)	1.110(2.782)***	-.363(-.429)	.155(.494)	.060(.442)	-.265(-1.257)
Plumbers	.342(2.175)**	.148(1.324)	.018(.103)	.228(.979)	-.005(-.027)	.036(.617)	.040(.428)
Pipefitters	-.631(-2.518)**	.163(1.202)	-.176(-.854)	.222(.508)	.552(2.593)**	-.056(-.651)	.196(1.790)*
WASHINGTON							
Carpenters	.068(.513)	-.006(-.123)	-.087(-.841)	.218(.587)	-.433(-3.104)***	.114(2.240)**	-.134(-1.186)
Electricians	-.247(-1.550)	-.044(-.520)	-.063(-.256)	.392(1.365)	.072(.369)	.069(.999)	-.013(-.141)
Operating Engineers	.051(.541)	.067(1.232)	.015(.142)	.409(2.325)**	-.120(-.965)	-.123(-2.285)**	.152(2.126)**
Plumbers	.059(.479)	.083(1.898)	.218(1.938)*	-.250(-1.351)	.106(1.028)	-.048(-1.537)	-.045(-.986)
Steamfitters	-.169(-1.052)	.047(.665)	-.174(-1.017)	-.144(-.694)	.271(2.173)**	-.008(-.157)	.118(1.498)

***significant at .01 level; **significant at .05 level; * significant at .10 level.

SOURCE: Interviews with journeymen.

background, the factors that determine the extent of participation in union upgrading courses were not discovered in this study.

Responses from Non-Participants

Journeymen who had not taken part in upgrading activities were asked their reasons for not participating, in order to get some idea of the factors that impede upgrading efforts. Not surprisingly, over half the respondents said that they felt proficient enough in the skills which were being taught; for them upgrading efforts would be redundant. Almost as many--42%--said that the classes were given at either inconvenient times or locations. Almost all courses were offered at night, often many miles from the journeymen's homes; as an electrician in Washington put it, "I live 35 miles away, and after work [commuting to and from evening classes] was just too much." Evidently, the prospect of driving long distances at the end of a hard work day to attend three and four-hour classes dissuaded large numbers of workers from participating.

Other reasons mentioned by non-participants were unavailability of courses (17 percent), non-relevance of courses to work situations (19 percent), poor quality instruction (3 percent), fear of losing face in front of other journeymen (2 percent), and other reasons (58 percent), ranging from league bowling and serving on a county racing commission to the desire to spend leisure time at home--and laziness. Those who responded that courses were not available were misinformed, or, more often, had not been apprised of the unions' course offerings. Most of the journeymen who felt that course offerings were not relevant to their jobs indicated that the courses being offered were in areas outside their own specialties, but would undoubtedly be useful to other journeymen. The few who thought the courses were poorly taught were outnumbered by those who had heard favorable reports from participants. It was not surprising that few respondents indicated a fear of being embarrassed in class by their ignorance of certain topics; undoubtedly most who did fear embarrassment named other reasons for not participating. In any event, the factors named by journeymen as reasons for not taking part in upgrading courses suggest means for improving the attractiveness of course offerings and increasing journeymen's participation in upgrading. These topics are discussed in the concluding section of this report.

IV. IMPLICATIONS FOR MINORITY HIRING

A major intention of this project was to assess the prospects for using journeyman upgrading programs to expedite the entry of minority-group members into the skilled construction crafts, especially by facilitating the workings of various imposed and "hometown" minority hiring plans. Skill improvement and upgrading programs for journeymen might be of significant benefit, both to minority craftsmen and to the industry, in broadening the skills of minority workers in order to qualify them for membership in building trades unions.

The principal reason for exploring the possibility of using upgrading programs to increase minority hiring was that imposed hiring plans have usually couched their minority hiring goals not in terms of increased minority membership in unions, but either in terms of minority man-hours worked on federal jobs, or in numbers of minorities working for federal contractors. Thus, minority journeymen, apprentices, and "trainees" of various kinds are all counted equally in periodic compliance audits, and data generated from these audits seldom reveal the extent to which local hiring plans have led to increases in the percentage of the permanent construction labor force made up of minorities.

The difficulty inherent in setting minority hiring goals that do not call explicitly for increases in minority union membership should be apparent: in times of declining employment in construction, unions tend to oppose any attempt to employ nonmembers (e.g., trainees, travelers from other unions, workers on temporary permits) while local members do not have jobs. Thus a local hiring plan whose goals are set out in terms of minority man-hours worked or minority "body count" may appear to be successful as long as employment opportunities abound, because contractors can meet minority employment goals by hiring trainees, travelers from other locals, and workers on permits. But when job opportunities contract, unions may not continue to allow non-members--including most minorities--to work in their jurisdictions. If such is the case, it is fatuous to expect hiring plans to achieve meaningful results when full union membership is not an explicit goal of the plans. Without union membership, minorities will be unable to work in construction except in prosperous periods.

A Possible Role for Upgrading

Assuming a reasonable rate of expansion of employment

in union construction, however, journeyman upgrading programs might be used to increase not only minority hiring but also union membership. Historically, most unions have allowed Anglo workmen to become full-fledged journeymen without serving formal apprenticeships, or, indeed, even having mastered all phases of their crafts. Particularly in times of high employment, unions have admitted journeymen who were qualified to perform only a small proportion of the work in their jurisdictions. In addition, unions in numerous cities have recently begun to organize residential construction by forming residential branches for workers whose skills enable them to perform routine tasks in homebuilding but not the more highly skilled commercial and industrial work. These new members are expected to remain in the residential branch for a period of several years, but may move up into the commercial and industrial branches after acquiring the requisite skills in upgrading classes.[11] And one IBEW union (Local 716 in Houston) has implemented a program of admitting partly skilled electricians to full journeyman membership, on the condition that they remedy any skill deficiencies through the industry's upgrading program.

In light of existing union practices of admitting partially qualified white journeymen, it would not seem inequitable or impractical to ask unions to admit partially skilled minority workers as journeymen, on the conditions that, once admitted, they broaden their skills through upgrading courses, as white journeymen have done on a regular basis in many crafts. Such a procedure would be used only for minorities with enough construction experience to command the journeyman rate of pay--large numbers of whom have been consigned to trainee or advanced trainee status, without union membership, under existing plans. And it could be used only in those trades whose upgrading courses are offered in enough skill areas to enable new journeymen to broaden their training significantly. Where these conditions exist, however, minority journeymen could be placed not only on jobs covered by local hiring plans, but also into the building trade unions themselves, with rights and privileges not held by trainees or workers on permits. Moreover, this type of approach should benefit the unions by increasing the demand for courses that sometimes fail to "make" because too few journeymen sign up for them.

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[11] Marshall et al, Training and Entry into Union Construction, op. cit., Ch. III.

To determine the feasibility of implementing the above ideas in specific areas under known conditions, inquiries were made in Washington and Miami, where minority hiring plans had been underway for several years. Unfortunately, much needed information concerning attainment of hiring goals was not available, but some tentative conclusions based on the experiences in these cities were reached, and are summarized below.

The Washington Plan

Imposed by OFCC in 1970, the Washington Plan spelled out its minority hiring goals in terms of man-hours worked by minorities in each of eleven "critical" trades. The plan was in the process of revision at the time of the survey, and the sensitive nature of the negotiations made retrieval of pertinent data for this study practically impossible. Indeed, at the time of this writing, all attempts to obtain up-to-date information on achievements under the plan had been unsuccessful. Thus, no claim is made that the data presented below are complete or current; they are simply the best and most recent available.

The original Washington Plan called for the hiring of one minority for every non-minority hired in the "critical" trades by contractors on federal and federally-assisted projects in the Washington SMSA. It was felt that such a hiring schedule would allow these trades to take in enough minorities in four years for minority employment in the trades to reflect the minority work force in the SMSA, without discriminating against qualified non-minorities.[12] Differing rates of attrition, original levels of minority utilization, and availability of trained or trainable minorities in the area contributed to considerable dispersion in minority man-hour percentage goals.

A compliance check made on federal job sites in the fall of 1973 revealed that the trades in this study that were covered by the plan had the following percentages of minority workers on the sites surveyed: electricians, 26%; plumbers, 18%; steamfitters, 17%. In addition, 34% of operating engineers and 19% of carpenters were minorities.[13] As Table 25 shows,

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[12]Washington Plan directive, p. 10.

[13]Since the compliance check figures were in terms of "body count," they are not strictly comparable with the goals stated in the plan, which were set forth in terms of man-hours worked.

TABLE 25

Minority Hiring Goals, Attainments, and Journeyman Membership of Surveyed Unions, Washington, 1973

Trade	Percentage Minority Employment Goals, 1973[a]	Percentage Minority Employment, 1973[b]	Percentage Minority Journeymen, 1973[c]
Electricians	28-34%	26%	4%
Plumbers	25-30%	18%	3%
Steamfitters	25-30%	17%	6%
Carpenters	-[d]	19%	14%
Operating Engineers	-[d]	34%	29%

[a] Washington Plan directive, p. 13.

[b] Imposed plan compliance check report, Fall, 1973.

[c] From Community Advisors on Equal Employment, Myth and Reality: Equal Employment Opportunity in Metropolitan Washington, pp. 61-62.

[d] Since these trades were not considered "critical" no minority hiring ranges were specified in the original Washington Plan.

only the electricians, of the three "critical" trades in this study, had come close to meeting their hiring goals for 1973-74; the plumbers and steamfitters were still far below the ranges specified for their trades.

Even more noteworthy, however, was the fact that few minority employees in the three "critical" trades were union journeymen. Likewise, there were few apprentices: not one of these trades had indentured minority apprentices at a rate which would ultimately allow the trade to reach its hiring goal. Therefore, most of the minorities in those trades must have been either trainees or workers on temporary permits--the very workers who, as noted, would be most susceptible to layoffs as construction activity slackened.

A situation such as that in Washington would appear ideal for the implementation of the proposed process of admitting partially trained minorities into journeyman positions in the target unions, and allowing them to upgrade their skills in courses available through the unions. However, a review of the Washington Plan in September, 1974, concluded that there were insufficient minority journeymen in the Washington SMSA to promote minority membership through direct intake of minority journeymen.[14] Furthermore, it was the opinion of several knowledgeable persons connected with the Washington Plan that it would be undesirable to "raid" minority contractors in order to obtain more minority journeymen for the unions. Instead, the revised plan (which, at this writing, had not yet been ratified) called for minorities to be taken into each trade in a ratio of one minority to two non-minorities at every level of training, with the ultimate, and explicit, goal of full union membership--a significant departure from the original plan, which did not spell out goals for minority membership in unions.[15]

While the revised Washington Plan was encouraging in its emphasis on routes to full union membership, as well as to jobs for minorities, it did not settle the issue of minority intake through journeyman upgrading. The allegation that there were not enough minority journeymen in the area may be misleading, especially since the hiring goals would not, in any case, be met solely by direct admission of journeymen.

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[14] "Revised Washington Plan" (draft), p. 2.

[15] Ibid.

Further, only the problem of placement of partially qualified minority craftsmen is at issue, since it is assumed that fully qualified minorities will be taken in as journeymen without a fuss. It is precisely these partly trained journeymen who could be taken into the unions, who would benefit most from journeyman upgrading courses, and whose admission would aid immeasurably in the attainment of minority employment goals under the Washington Plan. How many such workers there were in the SMSA at the time of this study is not known, but the feeling persists that the creation of this route to journeyman status could be extremely productive, provided that jobs could be found for the new journeymen in union construction.

The Miami Plan

Implemented in late 1971, the Miami Plan was a tripartite agreement among the Building and Construction Trades Council, numerous employers associations, and a coalition of minority organizations. Its goal was to increase minority participation in union construction to a level of 20 percent in each trade within five years. Minorities were to comprise at least two percent of each craft's referral unit after one year, six percent after two years, ten percent after three years, and 15 and 20 percent at the end of the fourth and fifth years.[16] The only trades not signatory to the plan were the ironworkers, whose international union had implemented its own minority hiring and training program, and the electricians, who were being sued for alleged discriminatory practices, and who therefore declined to take part in this effort.

An audit of the trades participating in the Miami Plan, conducted in November, 1974, revealed widely varying results in employment of minorities (see Table 26). Three-fourths of the unions signatory to the plan had attained the relatively modest third-year goal of ten percent minority membership, though at least three locals (the laborers, plasterer tenders, and kettlemen) had been predominantly minority before the plan was implemented. The asbestos workers, elevator constructors, pipefitters, and plumbers had not realized the ten percent minority hiring goal, nor, one would suppose, had the electricians. The mechanical trades in Miami, as in Washington, had been unable or unwilling to increase their minority membership even to ten percent, despite the fact that the

[16]Since minorities were estimated to make up some 49 percent of the work force in the Miami area, the Miami Plan was obviously less ambitious in its ultimate goals than the Washington Plan, which aimed at achieving a minority employment rate in construction equal to the minority proportion of the general work force.

TABLE 26

Minority Hiring Goals and Attainments Under the Miami Plan, by Trade, 1974

Union	Membership in Referral Unit	Minority Membership					Third-Year Hiring Goal (10% of Column
		Black	SSA	American Indian	Oriental	Total	
Asbestos Workers #6	165	1	9	3	0	13	17
Boilermakers #433	450	2	50	10	7	69	45
Bricklayers #7	1750[a]	200	100	0	0	300	175
Painters District Council	1600	11	296	5	1	313	160
Carpenters District Council	7239	800	2000	10	0	2810	724
Elevator Constructors #71	215	0	12	1	0	13	22
Laborers #478	3003	2252	450	0	0	2702	300
Lathers #345	200[a]	8	11	1	0	20	20
Marble Polishers #121	350	122	52	0	0	174	35
Operating Engineers #487	1400	142	31	2	0	175	140
Pipefitters #725	390	4	20	0	2	26	39
Plasterer Tenders #635	400	360	32	8	0	400	40
Plumbers #519	824	15	55	0	0	70	82
Roofers (Kettlemen) #316	210	140	2	0	0	142	21
Roofers #57	175	13	3	4	0	20	18
Sheet Metal Workers #223	1005	25	191	0	0	216	101

[a]Total membership figures are given for these unions, since referral unit membership figures were not available.

SOURCE: Miami Plan field audit, OFCC, November, 1974.

previous three years encompassed a building boom unmatched in the area's history. The prospects for attaining 20 percent minority membership in these trades during a depression in the construction industry appear bleak indeed.

OFCC auditors also learned that virtually all minority craftsmen placed under the Miami Plan were apprentices. Only about one percent in most trades were journeymen, according to OFCC, and except for the ironworkers, the unions had not used the trainee categories as routes to membership. This finding was curious, because there are large numbers of skilled minority workers, especially Cuban-Americans, in non-union construction in South Florida. While the Washington unions' inability to take in minorities as journeymen may have arisen from the dearth of minority craftsmen in non-union construction, this was clearly not the case in Miami. Unions having difficulty meeting their hiring goals would therefore be well advised to tap this extensive source of minority manpower, and the upgrading programs already in place for plumbers and pipefitters could facilitate the intake of minority journeymen in those trades, as previously suggested.

Both Miami and Washington, then, appear to be cities in which efforts to increase minority membership in building trades unions could be bolstered, perhaps substantially, by admitting partially skilled minority journeymen on the condition that these minority members round out their skills through industry-sponsored upgrading programs for journeymen. Such an approach would benefit some minority workers (though obviously not those with few job skills) in Washington, where hiring goals have been met largely by allowing minorities to work in the unions' jurisdictions without being admitted to membership. Under the present system, these workers are the most vulnerable to layoffs when work slackens; by gaining union membership, their vulnerability would be much reduced. In Miami, the upgrading route would assist unions in admitting some of the large numbers of minority craftsmen currently working in open shops.

It should be noted in closing that this approach to increasing minority membership in construction unions is meant to apply only in prosperous periods, when there are abundant job opportunities for both present and prospective union members. It would be unrealistic to suggest that the upgrading route be implemented during periods of high unemployment. Unions would rightly oppose such a measure when many of their members were out of work, and minority craftsmen would find little work in such conditions even if they were admitted to

membership. During slack periods, minority entry into construction unions is best effected through regular apprenticeship programs, and even that route is curtailed due to the reduced number of training slots in apprenticeship programs. More ambitions methods, such as the journeyman upgrading approach suggested here, require a more salubrious economic climate.

V. SUMMARY AND RECOMMENDATIONS

Carried out in the spring and summer of 1974, this project surveyed upgrading programs available to journeymen members of nine building trades unions in Washington, D.C., and Miami, Florida. The purpose of the study was to gather information about the kinds of courses given, the trades in which upgrading most often took place, the journeymen who were most apt to take part in upgrading activities, the effects of upgrading on individual workers' job opportunities, and possible improvements in the system. Additionally, it was hoped that the study could assess the feasibility of using upgrading programs to speed the entry of minority workers into the construction industry.

Since almost no published information was found to exist on the subject of upgrading, the data used in this study were taken from primary sources, chiefly interviews with 405 journeymen in the surveyed trades, 99 contractors, union and training program officials in Miami, Washington, and six other cities, and knowledgeable persons connected with the Bureau of Apprenticeship and Training and with the Washington and Miami minority hiring plans. The principal findings of the survey may be summarized as follows:

Extent and Importance of Upgrading Programs

Journeyman programs were concentrated in electrical work, carpentry, and the pipe trades--the crafts in which formal apprenticeship programs were most firmly established. These unions, together with the operating engineers in Washington, were the only ones offering upgrading courses in Miami and Washington at the time of the survey. Probably from one-fourth to one-third of the members of these unions had participated in upgrading classes. Since other unions had no formal training opportunities, a reasonable estimate would be that around ten percent of all construction journeymen in Miami and Washington had improved their skills through upgrading courses. These estimates are of the same magnitude as those made by training directors in Atlanta, Austin, Chicago, Columbus, Houston, and San Francisco.

Though formal upgrading had not, at this writing, reached large numbers of journeymen outside of electrical work, the pipe trades, and carpentry, there was an unmistakable trend toward more course offerings in other trades, and toward greater

participation by journeymen over time. Of the 40 training programs surveyed in eight cities, twelve had implemented courses for journeymen in the last five years; thus the number of journeyman upgrading programs in these trades has increased by roughly 50 percent since 1970. Journeyman participation is likewise growing: surveyed journeymen had taken 40 percent of their courses since 1970, compared with only ten percent before 1960. As course offerings and journeyman participation increase, upgrading programs will play an increasingly significant role in the system of training in union construction.

Course Offerings and Organization

Practically all responsibility for upgrading rested with the unions and JATC's, with very little input from contractors. Twenty percent of employers surveyed were unaware that the industry was providing journeyman training, even though such training was financed largely by contractors' contributions to industry training funds. Of the remaining contractors, fewer than half had any idea of how many, if any, of their employees had participated or which courses the journeymen had taken.

Upgrading classes were offered on a demand basis; only if enough journeymen (say 15) were interested would a given course be taught. Welding, safety and first aid, blueprint reading and drafting were common courses in most of these unions. Each union also had specialty courses, of which the most important were electronics, motor controls, and electrical code (for electricians); air conditioning, refrigeration, controls, and plumbing code (pipe trades); and tower crane operation (operating engineers).

Almost all classes were taught at night by journeymen members of the sponsoring unions, although welding and code instructors often were not union members. Classes were held in private industry training facilities, where such were available, in local public or parochial schools, or in union meeting halls. Classes varied in length from around four weeks, for short courses in first aid and installation of certain new building products, to one school year. Some welding courses had no specified length; instead, shop facilities and instructors were available at specified times, and journeymen could come as they chose for individual instruction.

Profile of Upgrading Participants

The study was unable to show significant differences

between journeymen who had taken part in upgrading courses and those who had not. About the only factor setting the two groups apart was that participants were more likely to have received their early training in apprenticeships than were non-participants. (Apprenticeship background was also the single most important determinant of the number of courses taken by journeymen.) Otherwise, educational attainment, length of time in the trade, and other factors that might be thought to be important determinants of upgrading participation looked pretty much the same for participants and non-participants. The factors that encourage or discourage participation in these courses may be internal, psychological traits that could not be measured in this survey.

For those journeymen who did take part in upgrading courses, age was an important factor. Almost all respondents had taken courses before they were forty years old, while very few enrolled after age forty, presumably because the returns they expected to realize from training diminished greatly as their remaining worklife decreased.

Most non-participants said they had not taken classes because they felt their skills were sufficiently up to date that they had no need to enroll. However, the fact that classes were usually held after work, frequently in inconvenient locations, had dissuaded a large number of respondents from participating. Finally, more than a few journeymen had not taken part because they had never been informed that courses were available.

Impact of Upgrading Courses

For several reasons, including the wide variety of courses offered, the skill content of individual courses, the generally high level of construction activity and the resulting tight labor markets in both cities, and other factors in journeymen's training backgrounds, it was beyond the scope of this study to make an objective assessment of the effects of individual courses on journeymen's employability. Practically all journeymen felt that their employability had been enhanced as the result of their upgrading activities, but objective measures for testing the journeymen's beliefs were not available. Most journeymen felt that their taking part in upgrading had not led to promotions to supervisory positions; this feeling was probably accurate, since nearly all contractos said they had not promoted people on the basis of upgrading participation.

Policy Recommendations

Though this report has been primarily descriptive of journeymen upgrading programs in their present form, several problems regarding the upgrading system seem worthy of mention in closing:

(1) Unions and training programs should take greater pains to see that their members are informed of available upgrading opportunities. One-sixth of the journeymen who had not taken upgrading classes reported that they had been unaware that such classes were being held. Since all interviewees belonged to unions which offered such courses, it was apparent that serious gaps in information existed, especially in the case of the carpenters in Miami. This failure to communicate may be traceable in part to the informal means of communication in some locals (e.g., announcements in union meetings, which are usually sparsely attended). Further, some journeymen are hard to contact because they change addresses frequently or have unlisted telephone numbers. Regardless of these difficulties, unions and training directors should increase their efforts to contact these members, because many who were unaware of the courses' availability said they would have taken part if they had been informed.

(2) There should be a significant increase in contractor input in upgrading activities. One of the most startling findings of the survey was an almost total lack of knowledge about upgrading programs on the part of contractors. Very few employers knew which, if any, of their workers had taken part in upgrading or which courses they had taken; twenty percent were unaware of the courses' existence.

Contractors could, by emphasizing the importance of new materials and techniques in their businesses, exert a positive influence over the kinds of courses that are taught and on the importance of journeymen's participation. By keeping track of those employees who take part in upgrading, contractors could monitor the journeymen's skill development in job situations, and assign journeymen to tasks which would reinforce their classroom learning with practical experience. Instead of complaining that too many journeymen are unwilling to improve their trade knowledge, contractors should take active parts in informing journeymen about training opportunities, developing upgrading curricula, and teaching various courses. The present lack of employer participation -- and, seemingly, interest -- in journeyman upgrading may very well reinforce some journeymen's belief that upgrading is not important, since their employers seem to take so little interest in it. By participating more directly, contractors could enhance the quality

and relevance of specific courses and improve attitudes toward the importance of the upgrading system.

(3) Journeymen's participation in upgrading would probably be increased if classes were held at different times. One of the most important reasons for non-participation in upgrading courses was that classes were held at night, when workers did not feel like traveling many miles to attend a three- to four-hour class. An alternative would be to offer courses on weekends, when journeymen would have time to recuperate from the week's work and would have more time to spend in class. Weekend offerings, of course, would have to compete with hunting, fishing, yard work, and other family activities which the journeymen usually engaged in on weekends. It is difficult to say whether changing from night to weekend courses would increase or decrease participation, but it would be worth a try in cases where journeyman interest has lagged.

Another possibility for improving journeymen's participation would be to adopt a policy, used by some apprenticeship programs, of allowing workers in training to attend courses for one work day per week, at full pay. Apprenticeship coordinators heartily endorse such systems, because they feel that training is more effective if it does not take place at the end of a long day. By increasing the number of participating journeymen, this approach might also generate interest in courses other than those presently offered, and thereby attract journeymen who are interested in participating but who have thus far not been able to find courses that are relevant to their particular needs. Contractors, of course, would incur increased costs during the training period, but should expect to recover those costs in increased productivity over time.

(4) Participation in upgrading courses would be increased if unions required periodic certifications of journeymen in each trade. This measure was suggested by several journeymen, who felt that many of their fellow tradesmen ceased to keep up with their trades after acquiring their licenses (or, in the non-licensed trades, their journeymen's "tickets"). Such a policy would eventually weed out those workers who were unwilling to keep pace with new developments in their crafts, and it would undoubtedly promote interest in skill training through formal upgrading courses. The IBEW constitution allows its local unions to require this type of training for journeymen whose skills deteriorate below an acceptable norm. This type of action is, of course, highly unusual because of its lack of popularity with union members, and it may not be

permissible in other trades. Still, the idea is worth considering, if only rhetorically.

(5) The BAT should be given the responsibility and the resources to monitor journeyman upgrading programs more thoroughly. As was pointed out in the first section of this report, there are no comprehensive data sources on upgrading programs nationwide. While BAT collects some information on journeyman upgrading activities, the resources at BAT's disposal are apparently insufficient to the task of keeping track of the growing number of upgrading programs across the country. By enabling BAT to retrieve data on all journeyman training courses, the Department of Labor could generate a useful fund of information about journeyman upgrading.

(6) Upgrading programs should be used, where feasible, to assist partly trained minority craftsmen in gaining entrance to construction unions. These courses could present workable and acceptable alternatives to the training available to experienced minority workmen under numerous city hiring plans. Rather than being placed in apprenticeship programs, where they would work for months or years at tasks below their skill levels, or in trainee categories, in which union membership is not guaranteed, partially trained minority workers could be taken into building trades unions as journeymen on the basis of their qualifications and then broaden their skills in journeyman upgrading classes. Though such an approach would be workable only in unions whose upgrading offerings were extensive, and equitable only in unions which have admitted partially trained whites in the past, this procedure would nonetheless tend to increase minority membership in the trades which have had the most trouble in accepting minority workers as full-fledged members. It would also help to avoid the problem of meeting minority hiring goals by allowing minorities to work on temporary permits or as trainees during boom periods, but revoking these nonmembers' working privileges when work is less plentiful. By leading directly to increased union membership, it would give minorities a better chance to work at all times, rather than only during times of labor shortages.

APPENDIX A

Appendix A

Persons Who Provided Information for the Study

Union and Training Program Officials

Carpenters

Wallace Bray, Director, South Florida Carpenters Joint Apprenticeship and Training Trust Fund, Miami, Florida.

Miles Caudle, Business Agent, Piledrivers Local 2311, Washington, D.C.

Bob Crowther, Apprenticeship Director, Carpenters Local 1266, Austin, Texas.

Adolph Dardar, Apprenticeship Coordinator, District Council of Carpenters Apprenticeship Program, Chicago, Illinois.

Anthony Giaquinta, Director, Joint Carpentry Apprenticeship Committee of Washington, D.C. and Vicinity, Washington, D.C.

Richard Lichliter, Business Agent, Millwrights Local 1831, Washington, D.C.

John Miles, Apprenticeship Director, Carpenters Local 225, Atlanta, Georgia.

Cecil Strunk, Director of Training and Education, Carpenters District Council, Houston, Texas.

James Tinkcom, Director of Apprenticeship and Training, International Brotherhood of Carpenters and Joiners of America, Washington, D.C.

J. Wilcox, Assistant Director, Northern California Carpenters Apprenticeship and Training Program, San Francisco, California.

Electrical Workers

Leslie B. Baker, Director, National Electrical Joint Apprenticeship and Training Committee, Washington, D.C. (since retired).

Clinton L. Bearor, Director of Apprentices and Training, IBEW Local 26, Washington, D.C.

Thomas Burton, Apprenticeship Coordinator, IBEW Local 683, Columbus, Ohio.

Walter Griffin, Training Director, IBEW Local 613, Atlanta, Georgia.

Michael Ischy, Apprenticeship Director, and Max Ladusch, Business Manager, IBEW Local 520, Austin, Texas.

Edward Pierce, Apprenticeship Coordinator, IBEW Local 134, Chicago, Illinois.

William Sieffert, Director of Apprenticeship, IBEW Local 349, Miami, Florida.

Donald Tatum, Training Director, IBEW Local 716, Houston, Texas.

Otto Webber, Training Director, IBEW Local 6, San Francisco, California.

Ironworkers

Cecil Bosworth, Financial Secretary-Treasurer, Ironworkers Local 172, Columbus, Ohio.

Edward Flood, Apprenticeship Coordinator, Ironworkers Local 1, Chicago, Illinois.

Bill Hamilton, Director, Ironworkers Local 272 Joint Apprenticeship and Training Committee, Miami, Florida (since retired).

J.W. Hardesty, Training Director, Ironworkers National Joint Apprenticeship and Training Committee, Washington, D.C.

D.A. Ragsdale, Business Manager, Ironworkers Local 482, Austin, Texas.

Arthur Ronz, Training Coordinator, California State Ironworkers Joint Apprenticeship and Training Committee, San Jose, California.

F. Sanders, Apprenticeship Director, Ironworkers Local 84, Houston, Texas.

Ronald Vermillion, Business Manager, Ironworkers Local 201, Washington, D.C.

Operating Engineers

Rufus Deason, Coordinator, IUOE Local 926 Apprenticeship and Training Program, Atlanta, Georgia.

Reese Hammond, Training Director, International Union of Operating Engineers, Washington, D.C.

Ray Johnson, Administrator, IUOE Local 150 Apprenticeship Program, Chicago, Illinois.

Ed McGowen, Director, Operating Engineers and Related Industries Joint Apprenticeship Committee, Houston, Texas.

Jack McManus, Administrator, Operating Engineers Joint Apprenticeship Committee for Northern California, San Francisco, California.

Ernest Motta, Training Director, IUOE Local 77, Washington, D.C.

M.G. Shears, Business Manager, and Donald K. Moody, Training Director, IUOE Local 487, Miami, Florida.

United Association

Sam Armstrong, Business Manager, Plumbers Local 5, Washington, D.C.

Peter Diamond, Apprenticeship Director, Plumbers Local 130, Chicago, Illinois.

James Hamrick, Business Manager, Plumbers and Steamfitters Local 286, Austin, Texas.

Frank Howe, Training Director, and Sam Long, Business Manager, Plumbers Local 519, Miami, Florida.

Thomas Kerney, Training Director, and Ted LaValley, Business Manager, Pipefitters Local 725, Miami, Florida.

M.E. Moore, Business Manager, Steamfitters Local 602, Washington, D.C.

H.A. Parmenter, Joint Plumbing Apprenticeship and Training, Inc., Washington, D.C.

Richard Patterson, Apprenticeship Coordinator, Plumbers and Steamfitters Local 189, Columbus, Ohio.

Bill Pickens, Business Manager, Plumbers Local 68, Houston, Texas.

Dave Runnells, Apprenticeship Director, Pipefitters Local 211, Houston, Texas.

Larry Wallace, Apprenticeship Director, Plumbers and Steamfitters Local 72, Atlanta, Georgia.

Martin J. Ward, President, United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada, Washington, D.C.

Contractor Representatives

Alexander J. Czernowski, Master Builders Association (AGC), Washington, D.C.

Robert W. Haynes, National Electrical Contractors Association, Wasnington, D.C.

Ms. Eva Poling, Mechanical Contractors D.C. Association, Washington, D.C.

James L. Woodall, Associated General Contractors, Miami, Florida.

School System Officials

Forest Finerty, Supervisor, Apprenticeship Training Program, Dade County (Florida) Public School System.

Ed Newcomb, Assistant Supervisor for Trade and Industrial Education, Fairfax County (Virginia) Public School System.

Ed Tangman, Director of Trade and Industrial Education, Washington, D.C. Public Schools.

Other Persons Providing Assistance

Norris H. Barr, Project Administrator, The Miami Plan, Miami, Florida.

Philip J. Davis, Director, Office of Federal Contract Compliance, Washington, D.C.

Calvin Jennings, Labor Education and Advancement Program, Urban League of Greater Miami, Miami, Florida.

Nicholas A. Kolb, Bureau of Apprenticeship and Training, Washington, D.C.

Hugh Murphy, Director, Bureau of Apprenticeship and Training, Washington, D.C.

Donald Slaiman, AFL-CIO, Washington, D.C.

Ben Segal, Assistant to the Major, Washington, D.C.

Roland Williams and Warren Johnson, Project Build, Washington, D.C.

APPENDIX B

Interviewed by: _____

DATE _____

A. CITY

1. _____ Miami
2. _____ Washington

B. Union

1. _____ Carpenters
2. _____ IBEW
3. _____ Ironworkers
4. _____ Operating Engineers
5. _____ Plumbers
6. _____ Fitters

JOURNEYMAN INTERVIEW FORM

I. PERSONAL

1. Age

(1) _____ 18-25
(2) _____ 26-35
(3) _____ 36-45
(4) _____ 46-55
(5) _____ over 55
(6) _____ N/A

2. Race

(1) _____ Caucasian
(2) _____ Black
(3) _____ SSA
(4) _____ Indian
(5) _____ Oriental
(6) _____ Other

3. Marital Status

(1) _____ Single
(2) _____ Married
(3) _____ Widowed
(4) _____ Divorced/Separated
(5) _____ N/A

4. Number of Dependents (Including Self)

(1) _____ One
(2) _____ Two
(3) _____ Three
(4) _____ Four
(5) _____ Five
(6) _____ Six
(7) _____ More than Six
(8) _____ N/A

II. EDUCATION AND TRAINING BACKGROUND

5. Years of Formal Schooling . . . . . 1. _____ 0-6
2. _____ 7-8
3. _____ 9-11
4. _____ 12 [H.S. diploma or GED]
5. _____ 13-15
6. _____ 16 [college diploma]
7. _____ over 16
8. _____ N/A

6. High School Program . . . . . 1. _____ general
2. _____ college prep
3. _____ vocational
4. _____ cooperative/D.E.
5. _____ none
6. _____ N/A

7. Did you graduate from a formal apprenticeship program with related training in this trade? . . . . . 1. _____YES 2. _____NO

8. How long have you been a journeyman? . . . . . 1. _____0-2 yrs 2. _____3-5-yrs 3. _____6-10 yrs 4. _____More than 10 y

Before entering the union or apprenticeship program did you have any trade-related instruction in:

9. High School . . . . . 1. _____YES 2. _____NO

10. Vocational School . . . . . 1. _____YES 2. _____NO

11. Military . . . . . 1. _____YES 2. _____NO

12. Government Training Programs . . . . . 1. _____YES 2. _____NO

13. Other formal training . . . . . 1. _____YES 2. _____NO

Did you ever learn part of your trade:

14. From your father? . . . . . 1. _____YES 2. _____NO

15. From other relatives/friends? . . . . . 1. _____YES 2. _____NO

16. In open shops? . . . . . 1. _____YES 2. _____NO

17. -On jobs, as a helper or laborer . . . . . 1. _____YES 2. _____NO

III. SUPERVISORY WORK EXPERIENCE

18. Do you ever work as a supervisor (foreman, superintendent)? . . . . . 1. _____YES 2. _____NO

19. If "YES", approximately what percent of the time? . . . . . 1. _____All the time 2. _____3/4 of the tim 3. _____1/2 of the tim 4. _____1/4 of the tim 5. _____10% of the tim 6. _____N/A

20. How long had you been a journeyman before you got your first supervisory job? . . . . . 1. _____less than one year 2. _____One-Two years 3. _____Three-four yrs 4. _____Five-Six yrs 5. _____Seven-Ten yrs 6. _____More than ten yrs 7. _____N/A

IV. JOURNEYMAN UPGRADING

21. Have you ever taken journeyman upgrading, refresher, or skill improvement classes offered by your local's training program (including manufacturers' representatives)? . . . . 1. _____YES 2. _____NO

22. If you have never taken journeyman upgrading courses, what was the reason?

23. No courses available . . . . . 1. ____YES 2. ____NO

24. Already proficient in skills being taught in upgrading courses . . . . . 1. ____YES 2. ____NO

25. Course material not useful in job . . . . . 1. ____YES 2. ____NO

26. Understood classes or instructors were poor quality . . . . 1. ____YES 2. ____NO

27. Classes held at inconvenient time or location . . . . . 1. ____YES 2. ____NO

28. Didn't want to appear "unqualified" in presence of other journeymen . . . . . 1. ____YES 2. ____NO

29. Other reasons . . . . . 1. ____YES 2. ____NO

Have you upgraded your skills by taking courses:

30. Offered by other unions? . . . . . 1. ____YES 2. ____NO

31. In vocational schools? . . . . . 1. ____YES 2. ____NO

32. In college? . . . . . 1. ____YES 2. ____NO

33. By reading on your own textbooks, tradejournal, etc.)? . . 1. ____YES 2. ____NO

COURSE	Year Taken	Age When Taken	LENGTH OF COURSE: Weeks	Hours/ Week	Total Hours	Fee	Was Your Instructor	Was the Class Given With Apprentices?	Format	How Did You Hear About the Course?	Reason For Enrolling	Did You Complete the Course?	If Not, Why Not?
							Another Journeyman Supervisor Union Official Contractor (Other)	Yes No	Classroom Shop OJT (Other)	Other Journeymen Foreman Contractor JATC (Other)	Brush-Up New Product New Process No prior Instruction (Other)	Yes No	
							Another Journeyman Supervisor Union Official Contractor (Other)	Yes No	Classroom Shop OJT (Other)	Other Journeymen Foreman Contractor JATC (Other)	Brush-Up New Product New Process No Prior Instruction (Other)	Yes No	
							Another Journeyman Supervisor Union Official Contractor (Other)	Yes No	Classroom Shop OJT (Other)	Other Journeymen Foreman Contractor JATC (Other)	Brush-Up New Product New Process No Prior Instruction (Other)	Yes No	

RESULTS OF COURSEWORK

Was Your Employability Increased As A Result?	Were You Promoted As A Result?	Did The Course "Inspire" You To Take More Courses?	Would You Recommend The Course To Other Journeymen?	(Instructors, length of course, organization, course materials, format relevance to job, other) STRONG POINTS	WEAK POINTS
Yes No Don't Know	Yes No Don't Know	Yes No Don't Know	Yes No Don't Know		
Yes No Don't Know	Yes No Don't Know	Yes No Don't Know	Yes No Don't Know		
Yes No Don't Know	Yes No Don't Know	Yes No Don't Know	Yes No Don't Know		

APPENDIX C

Interviewed by: _____

DATE _____

A. CITY

1. _____ Miami
2. _____ Washington

B. Contractor Group

1. _____ general
2. _____ electrical
3. _____ plbg/heating/AC
4. _____ excavating/grading
5. _____ Other (_____)

CONTRACTOR INTERVIEW FORM

1. Are upgrading classes for your workers currently being sponsored by their union or JATC?

   1. ____YES
   2. ____NO
   3. ____Don't Know

2. If "YES," please list:

3. Have any of your employees taken such classes?

   1. ____YES
   2. ____NO
   3. ____Don't Know

4. If "YES" were the participants

   1. ____Journeymen?
   2. ____Supervisors?
   3. ____Both?

5. (a) What classes were taken by journeymen?

   (b) By supervisors?

6. Are the participants better qualified workers as a result of taking upgrading classes?

   1. ____YES
   2. ____NO
   3. ____Don't Know

7. Have you promoted any workers because of their participation in upgrading classes?

   1. ____YES
   2. ____NO

What role, if any, do you play in journeyman upgrading?

8. Are you a member of the JATC?

   1. ____YES
   2. ____NO

9. Are you an instructor (past or present)?

1. _____YES
2. _____NO

10. Do you encourage workers to participate in upgrading classes?

1. _____YES
2. _____NO

11. Have you taken such classes yourself?

1. _____YES
2. _____NO

12. From your experience, do the journeymen who need additional training the most actually take advantage of the courses that are available?

1. _____YES
2. _____NO
3. _____Don't Know

13. What advice would you give regarding possible improvement or broadening of course offerings?

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