

# **Steward Training in the Construction Industry: The United Brotherhood of Carpenters and Joiners of America Faces the Challenge**

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*This article examines the development and delivery of the Carpenters union national construction steward training program. It describes the collaboration of the union and Cornell University in the design of the curriculum and the use of a train-the-trainer model in the delivery of the steward program in construction locals throughout the United States and Canada. Finally, it evaluates the effectiveness of the program in relation to the transfer of knowledge to participating stewards.*

In recent years, providing uniform steward training has emerged as an important challenge for building and construction trades unions. The two largest B&CT unions, the International Brotherhood of Electrical Workers and the United Brotherhood of Carpenters and Joiners of America, have initiated ambitious programs to train their construction stewards throughout the United States and Canada.<sup>1</sup> The New York State School of Industrial and Labor Relations at Cornell University has worked closely with both unions in the development and delivery of these national steward training programs. This article reviews the experience of the Carpenters union and offers an initial evaluation of the effectiveness of its program.

Why have these two unions undertaken national steward training programs at this time? There is a growing sense of crisis within almost all of the B&CT unions. The convergence of several historical circumstances has disrupted an industrial relations equilibrium that had endured for about seventy-five years in the construction industry. The intervention of "outside" forces—including the government and construction users and owners—into the collective bargaining process during the 1960s and 1970s was designed to tame the "murderous bargaining strength" of the B&CT unions.<sup>2</sup> The emergence of corporate employers, like Turner, BE&K, Bechtel, and others, has challenged the once dominant power of local construction unions operating in an industry characterized by small employers. And the rise of a viable open shop market has further weakened the vitality of B&CT unions that once enjoyed a near monopoly of the skilled labor supply.<sup>3</sup>

The resulting crisis—reflected in declining union membership and market share—has forced the B&CT unions to rethink traditional policies and to inaugurate a range of new strategic initiatives. Within the IBEW and the UBC, the most important of these new initiatives

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<sup>1</sup> The IBEW membership is about 800,000, although a majority of its members work outside the construction industry in manufacturing, telecommunications, utility and broadcasting. The UBC membership is over 600,000. The IBEW's Construction Steward Training Program was the first national program developed specifically for a B&CT union.

<sup>2</sup> "The Industry Capitalism Forgot," *Fortune* (August 1947).

<sup>3</sup> For a good overview of the crisis in the B&CT, see Mark Erlich, "Who Will Build the Future?" *Labor Research Review* No. 12 (Fall 1988), 1-17.

have been their aggressive organizing programs, both of which aim to regain union control of the labor market in order to rebuild declining bargaining strength. But both unions have also established a number of new educational programs, including steward training.<sup>4</sup>

How can steward training help revitalize the fortunes of these unions? Before the rise of the open shop, the local B&CT union leader enjoyed a position of remarkable strength and authority within his local market. He could resolve jobsite problems expeditiously, negotiate agreements expertly, enforce those contracts effectively, and during boom times provide jobs for his members effortlessly. In the past, local union business representatives generally fulfilled these functions without reliance on an operative steward system and without resort to a formal grievance procedure

"But," concede the Carpenters, "in most of our jurisdictions, that time has passed." Confronted by the specter of the open shop, the business representative can no longer run a local union as a one-man show. The Carpenters now recognize that a "team concept" based on an "organizing model of unionism" is essential if the union is to survive and thrive in the twenty-first century.<sup>5</sup>

This recognition represents a dramatic departure from the past. According to the union, "business as usual will no longer do." Traditionally, the relationship between the business representative and the local membership was essentially transactional: the members paid their dues and the local leadership provided a service that included wages, benefits, and jobs. "Under today's circumstances," the union writes, "it is nearly impossible for most business representatives to provide the kind of 'service' our members unrealistically expect."<sup>6</sup>

The carpenters union now argues that "local union leadership cannot serve and solve the problems of the membership without activating and involving the rank and file." Members are not to be viewed as passive consumers of a "union service," but rather the union's greatest resource. "But to mobilize that resource," explains the union, "we must create a more active and effective union presence on the jobsite. By developing a cadre of well-trained and dedicated union stewards, we are taking an important step toward a union model that draws its strength from the rank and file."<sup>7</sup>

Carpenter General President Sigurd Lucassen has announced that the union "is committed to the goal of seeing that effective stewards are present on each and every Brotherhood job."<sup>8</sup> But providing standardized training for its construction stewards presented itself as an enormous challenge. Like most B&CT unions, the UBC could not rely on an enduring tradition of labor education within the national union. Although it had produced a "Building Union" steward program over ten years ago and has more recently offered organizer's training, the union was not prepared to develop and deliver a uniform steward training program throughout the Brotherhood.

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<sup>4</sup> IBEW International President J.J. Barry has implemented both a major construction organizing program and an ambitious education program. Michael D. Lucas, currently Executive Assistant to the President, developed and directed the organizing program; Marty Letsinger, Education Department Director, is responsible for a wide array of education and training programs. UBCJA General President Sigurd Lucassen assigned the task of steward training to the union's Organizing Department, directed by Michael Fishman.

<sup>5</sup> UBCJA, "Foundations for the Future," 3.

<sup>6</sup> UBCJA, "Team Building" —Background Paper for Training Segment #1 of Comprehensive Construction Steward System: 7.

<sup>7</sup> Ibid.

<sup>8</sup> Sigurd Lucassen, "Message from the General President," to union instructors of the Comprehensive Construction Steward System.

Existing steward training courses offered by most university-based labor education centers were of little use because the available programs generally reflected the needs of stewards in traditional industrial settings. As such, these programs were inappropriate for building trades stewards facing the unique circumstances of the construction industry.

The union ultimately decided to work with Cornell University to create an original, customized Comprehensive Construction Steward System. Cornell's New York City-based Construction Industry Program helped the IBEW develop the first national Construction Steward Training Program, which is currently being delivered by specially trained international representatives utilizing a detailed instructor's manual. The IBEW program has trained about six thousand construction stewards in the last two years. The Carpenters planned to develop a steward training program that was more extensive than the IBEW's six-to-eight hour course and decided to use a similar "Train the Trainer" approach to deliver its program.<sup>9</sup>

Before beginning its collaboration with Cornell, the UBC Organizing Department conducted three months of field surveys to develop the framework for its program which was modeled at regional seminars throughout the United States and Canada. Through that process the Brotherhood assessed the need for and interest in a uniform steward training program, defined the essential roles and responsibilities of construction stewards, and shaped the basic form and content of the steward training program itself.<sup>10</sup>

The Carpenters decided upon a program that would involve eight two-hour training segments. The eight segments included: Team Building, Collective Bargaining and Contract Administration, Legal Rights and Obligations/Jurisdiction, Union Benefits, Health and Safety, Brotherhood History, Organizing, and Effective Communications. While each segment was designed to stand on its own, the entire program represented a comprehensive steward system tied together thematically by the slogan, "Foundations for the Future." (See Appendix A for a description of each training segment.)

Working closely with Cornell, union representative James E. Sala determined the actual content of the program and developed clear learning objectives for each training segment. Once the union articulated what stewards should *know* and *do* at the conclusion of each training segment, Cornell began to design the curriculum and write a *Trainers Manual*.

For each training segment a background paper was written to provide instructors with the essential content of that segment, A detailed lesson plan was drafted for each segment which guided trainers through a step-by-step training session, A panoply of participatory teaching techniques was utilized throughout the program including a variety of questionnaires, case studies, role plays, and directed discussions. All requisite training materials and aids were also assembled. Finally, a guide to setting up and preparing for each training segment was written to ensure that trainers were well prepared

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<sup>9</sup> The content of the IBEW's Construction Steward Training Program was determined by a development team that included international and local union representatives. A training videotape was produced, along with a *Business Manager's Guide*, a pocket guide for stewards, and a detailed instructor's manual with all requisite training materials. A similar Industrial Steward Training Program has graduated about 12,000 stewards. On the development process of the UBCJA program: correspondence with James E. Sala, Representative of the General President, June 6, 1991.

<sup>10</sup> Interviews, with Sala, during 1990. When the Carpenters contacted Cornell University, the union had already decided on the focus of each of the eight training segments.

before they conducted each training session.<sup>11</sup>

In addition to these papers, guides, and lesson plans, the *Trainers Manual* also included an introductory essay titled "Foundations for the Future" which explained the nature and significance of the steward program, A *Business Representative's Guide* was drafted by the union and edited by Cornell, This guide would be offered to all participating local unions and district councils to help them establish a comprehensive construction steward system. Finally, Cornell wrote a *Steward's Pocket Guide* that would be distributed to all participants in the training program.

After Training Segment #1, "Team Building," was drafted, a field test was conducted at a large Carpenters local in Connecticut, The enthusiastic response confirmed that the program was well-conceived and moving in the right direction.<sup>12</sup>

As the development of the overall project proceeded, the union and Cornell turned to the challenge of delivery. To reach the largest possible number of local stewards, it was decided that the program should be delivered by specially trained instructors from local unions and district councils.

Besides expanding the program's reach beyond that of a handful of union and Cornell instructors already equipped to deliver the training, the "Train the Trainers" format would empower locally based educators and engender a valuable sense of self-reliance.

A four-and-a-half day "Train the Trainers" program was, therefore, created to build a cadre of skilled instructors from the local unions and district councils. Several representatives from the general office were also trained to support the efforts of less experienced instructors who would be delivering the steward training throughout the Brotherhood.

Conducted by two Cornell labor educators and Jim Sala, the "Train the Trainers" program integrated several critical elements. The principles of adult education were discussed and the value of interactive and participatory pedagogy was emphasized. Various teaching techniques were demonstrated and analyzed by the Cornell staff. In order to enhance the competency of the field instructors, the substantive content of the steward training program was also carefully reviewed. Almost two full days were devoted to practice teaching. Instructors learned to use the *Trainers Manual* by delivering actual portions of the first two training segments to their colleagues, who played the roles of local union stewards. The practice teaching sessions involved critically supportive commentary by the labor educators and were widely regarded by the instructors-in-training as the most valuable part of "Train the Trainers" program.<sup>13</sup>

In addition to training prospective instructors, the "Train the Trainers" program served another essential purpose. Like the advocates of construction steward training within the IBEW, the designers of the UBC's steward program faced an army of skeptics and naysayers within their own union. Many leaders —from the local union up through the international — considered uniform construction steward training to be unnecessary or undoable. Some wished

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<sup>11</sup> Cornell University provided the union with a disk of all background papers, lesson plans, handouts, guides, etc. The Brotherhood handled layout, design, and production of the final manuals and guides.

<sup>12</sup> UBCJA Local Union #210 is an active local led by Business Representative John Cunningham.

<sup>13</sup> Cornell's Ken Margolies, Director of Labor Programs, and Jeff Grabelsky, Director of Construction Industry Programs, designed and coordinated the "Train the Trainers" course with the help of Jim Sala of the UBCJA,

to preserve the current nonpolicy, guided as it was by the "mushroom philosophy."<sup>14</sup> Others considered the enterprise of construction steward training to be futile. It was clear that the Comprehensive Construction Steward System would succeed only if a critical mass of union representatives were won over to the program. The "Train the Trainers" program, therefore, also "organized" its participants into a group that supported and promoted the steward training program within the union.

Through five rounds of "Train the Trainers," over one hundred representatives from local unions, district councils, and the General Office have been trained to deliver the Comprehensive Construction Steward System throughout the United States and Canada. Even after the four-and-a-half days of intensive training, it was apparent to the labor educators conducting the "Train the Trainers" programs that the prospective instructors demonstrated unequal competencies: some would perform well while others would require more practice and experience before they could effectively teach stewards.

Some critics of the steward program initially doubted that business representatives would countenance the training of stewards within their local unions. These critics argued that local leaders would view trained stewards as either a political threat to their incumbency or "loaded guns" on the jobsites posing greater risk than untrained, inactive stewards. The actual training is designed to calm such fears by stressing a team concept that utilizes stewards as extensions of the business representative, working to insulate the local union from the potential liabilities of improper steward conduct. In fact, the response of local union business representatives to the Comprehensive Construction Steward System has been overwhelmingly positive.<sup>15</sup>

Moreover, evaluation forms submitted by stewards who have participated in the program indicate that they find the training to be informative, useful, and interesting. But stewards who have been denied any previous training opportunities would predictably view almost any program that fills that educational void with some measure of enthusiasm. In general, an important goal of most labor education programs is to boost the morale of the participants. Even if specific learning objectives are not entirely achieved, the UBCJA program seems to heighten the spirits of the participating stewards.

Clearly, the favorable response of field trainers, local union business representatives, and stewards is a good indication that the Comprehensive Construction Steward System is meeting some need in the Carpenters union. But that favorable response should not stand in the place of a systematic evaluation of the program's effectiveness. Having invested significant time, money, and energy in the development and delivery of the steward training program, the Carpenters and Cornell should ask if the program's learning objectives are being achieved. Recently, labor educators have focused increasing attention on the challenge of program evaluation. In 1988, McKeen and Terry observed that meaningful evaluations of training programs were virtually nonexistent.<sup>16</sup> The following year, Hartenian and Brown Johnson

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<sup>14</sup> Jim Sala describes the "mushroom philosophy" of directing stewards as: "Keep 'em in the dark, and feed 'em a lot of B.S."

<sup>15</sup> Field instructors regularly report to Jim Sala on the reception of the training program across the country. Even the early supporters of the Comprehensive Construction Steward System have been pleasantly surprised by the enthusiastic response.

<sup>16</sup> R.L. McKeen and L.D. Terry, "Evaluation of a Minorities Leadership Institute in a Large Labor Union," *Labor Studies Journal* (Spring 1988), 58-77; L. Hartenian and N. Brown Johnson, "Criteria for Labor Education Program Evaluation," *Labor Studies Journal* (Fall 1989), 35-47. The interest in program evaluation is also reflected in two recent articles: M. Hugentobler, T. Robins, and S. Schurman, "How Unions Can Improve the

presented a model for program evaluation that helps define training goals, as well as criteria and methodologies for evaluation. Their model identifies three levels of training goals: individual, labor movement, and societal. In the case of the Carpenter's steward training program, the union had defined its goals in general terms before it began working with Cornell University, But Cornell assisted the union in clarifying the program's goals on the individual and union/labor movement level and then in articulating specific learning objectives for each segment of the training.<sup>17</sup>

Hartenian and Brown Johnson discuss three stages of program evaluation. For the first stage, instructors can determine if training content has been learned by administering a simple test. The second stage involves the perceptual reaction of participants as well as an evaluation of transfer of learning. For the third stage of evaluation, which addresses long-term outcomes, among other techniques, Hartenian and Brown Johnson suggest comparing trained participants with a control group of untrained individuals. In evaluating the Carpenters steward training program, Cornell ultimately modified and utilized several of these approaches.<sup>18</sup>

The efficacy of the Carpenters' Comprehensive Construction Steward System should be judged on two levels. In the short-run, are the immediate learning objectives for each training segment being achieved? In the long-run, will the union build a stable cadre of committed and well-trained stewards that can make a genuine contribution to the Brotherhood's strategic renewal?

To begin to determine if the immediate learning objectives are being achieved, this study focused on the experience of the 30,000-member New York City District Council of Carpenters, District Council President Paschall McGuinness decided to implement the Comprehensive Construction Steward System and to train between 2,000 and 3,000 jobsite stewards.<sup>19</sup>

Stanley Solaas, Assistant to the District Council President, participated in the third "Train the Trainers" program to become familiar with the content and format of the steward program. Subsequently, the leadership of the District Council designated four instructors who participated in the fourth "Train the Trainers" program. With support and guidance from union leaders and Cornell University, these recently trained instructors inaugurated the Comprehensive Construction Steward system by delivering Training Segment #1, "Team Building," The four instructors formed two teams and, in two consecutive evening classes, each team began training between twenty and twenty-five stewards per cycle. Thus, through each two-session cycle both teams trained between forty and fifty stewards, all of whom voluntarily participated in the program.<sup>20</sup>

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Outcomes of Joint Health and Safety Training Programs," and M, Parsons, "Evaluation of a Four-Step Model for Teaching Workers to Deal With Job Stress," *Labor Studies Journal* (Winter 1990),

<sup>17</sup> Hartenian and Brown Johnson, 37-39. On the assessment of steward training needs, see Brooke Broadbent, "Identifying the Education Needs of Union Stewards," *Labor Studies Journal* (Summer 1989), 46-61.

<sup>18</sup> Hartenian and Brown Johnson, 40-42. The evaluation of transfer of learning to jobsite attitudes and behavior was not undertaken in this study and poses special challenges in construction where worksites are mobile. See also, T.T, Baldwin and J,K, Ford, "Transfer of Training: A Review and Directions for Future Research," *Personnel Psychology* (Spring 1988), 63-105.

<sup>19</sup> Paschall McGuinness was recently elected Second Vice President of the International Union and is no longer President of the New York City District Council of Carpenters.

<sup>20</sup> Stanley Solaas no longer works for the New York City District Council of Carpenters; he is currently on the international staff, where he works on jurisdictional matters. Two of the four trainers were apprenticeship instructors who had no experience with labor relations programs. The other two trainers had no previous teaching experience. They have demonstrated a growing competency with each succeeding cycle of the

The enthusiastic response of the stewards participating in the training was encouraging to the District Council, When Cornell suggested that a systematic evaluation of the training be undertaken, the District Council welcomed the opportunity, Cornell developed a questionnaire based on the content of the training program which was reviewed and approved by the international union as well as the N,Y,C, District Council, The questionnaire was then administered to stewards to determine if the *knowledge* objectives of the training were being met. During the initial phase of the evaluation described in this article, no effort was made to determine if the knowledge outcomes of the training were being transferred to the jobsite and reflected in changed attitudes or behavior.<sup>21</sup>

The questionnaire is comprised of three sections. The first section focuses on biographical information, including the number of years the steward has been a member of the union, his/her years of experience serving as a steward, his/her previous training, and other related issues. Controlling for these biographical variables did not alter the survey outcomes.

The second section of the questionnaire, Knowledge Part I (KPI), is made up of twenty questions that reflect the learning objectives of Training Segment #1. The third section, Knowledge Part II (KPII), includes ten questions that reflect the learning objectives of Training Segment #2.

The questionnaire was administered to two groups of stewards from the New York City District Council of Carpenters, Group I included fifty stewards who had not yet participated in any training sessions of the Comprehensive Construction Steward System, Group II included forty-four stewards who had completed Training Segment #1, but like Group I had not yet experienced Training Segment #2, The two teams of trainers who taught Group II were still relatively inexperienced; they had conducted only three cycles of training, and during the first two cycles they received in-class support from two experienced instructors, international representatives Jim Sala and Steve Flynn, The questionnaire was administered to Group II after the third cycle of training.

The stewards in Group I and Group II completed the questionnaire in the same facility where the training takes place. Instructions were identical for both groups. Trainers explained that the questionnaire was part of a survey to evaluate the need for and effectiveness of the Carpenters steward training program and that everyone's thoughtful participation would help the union develop and deliver the best possible training for its stewards. Group I completed the questionnaire immediately before the start of the two-evening program for Training Segment #1, Group II completed the questionnaire immediately following the conclusion of the two-evening program for Training Segment #1, All the questionnaires were filled out and collected anonymously.

In addition, Group II was divided into two subgroups (IIa and IIb). Each subgroup was taught by a different team of two trainers. This allowed for a comparison of results that might reflect differences in effectiveness or competencies of the instructors.

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steward training program. The moral support they received from the District Council and the coaching they received from the Jim Sala and Cornell University seemed critical to their sense of confidence during the initial training cycles.

<sup>21</sup> A copy of the questionnaire is available from the author upon request. The author received guidance in designing the questionnaire from Professor Richard Kopelman, The coding and statistical analysis of the complete questionnaires was handled by Sumer Gupta.

The questionnaire results were compared to evaluate the knowledge levels of Group I and Group II in relation to Training Segments #1 and #2, The statistical analysis of the results is summarized in Appendix B.

The survey revealed that the stewards who had participated in Training Segment #1 (Group II), knew significantly more about their roles and responsibilities than did the stewards who had not yet experienced Training Segment #1 (Group I), The Pooled Variance Estimate T Value of -2.27 indicated a statistically significant training outcome for Knowledge Part I (KPI).

Moreover, when the two groups' content knowledge of Training Segment #2 were compared, the Pooled Variance Estimate T Value of 0,63 (Variable KPII), revealed no statistically significant difference between Group I and Group II, This result indicates that both groups have a roughly equivalent knowledge base absent formal steward training.

However, a comparative analysis of Groups I, IIa, and IIb revealed several interesting results. Although there was no statistical difference between Groups IIa and IIb, these two subgroups of trained stewards performed quite differently when compared with Group I, For KPI, there was a statistically significant difference between Groups I (untrained stewards) and IIa (trained stewards, subgroup a). But while the KPI Mean (10.45) for Group IIb (trained stewards, subgroup b) was higher than the KPI Mean (9.74) for the Group I, this difference was not found to be statistically significant. Subgroups IIa and IIb were trained in adjoining rooms in the same facility at the same time with identical lesson plans and materials. Differences in training outcomes may be explained by differences in the competencies or effectiveness of the two teams of instructors. This result was anticipated by the Cornell staff who conducted the "Train the Trainers" programs. But given the small sample sizes (24 and 20, respectively), only tentative conclusions can be drawn about differences between the two subgroups. (See Appendix B.)

It would be valuable to survey stewards after the instructors have acquired more training experience. Observing the trainers through the first three cycles of Training Segment #1, the Cornell staff was impressed with their growing competency. Future surveys might substantiate that impression.

The questionnaire results for the two largest available samples (Group 1-50 stewards and Group 11-44 stewards) are as encouraging as the positive field response to the steward training program. Having defined the steward's roles and responsibilities with new clarity and having designed a training program built around clear learning objectives, the UBCJA's Comprehensive Construction Steward System has demonstrated its effectiveness in conveying important knowledge to the union's stewards.

The primary limitation of this evaluation process is that it deals exclusively with *knowledge* resulting from the training, and not with *changed behavior*. The learning objectives of the UBCJA program are oriented around what stewards should *know* and *do* as a consequence of the training. While it is important to impart to stewards a body of knowledge that is essential to their functions as union representatives, it is even more important that such knowledge is reflected in changed attitudes and behavior on the jobsite. It does the Carpenters little good for a steward to know that he or she acts as a legal agent for the union and that improper steward conduct could result in a significant liability for the local union if the steward continues to engage in activities that expose the union to unwarranted risk.

Therefore, there is a need to evaluate systematically the desired changes in steward attitudes and behavior. Such an evaluation might examine subjective factors, like the perceptions of business representatives, rank and file members, and even contractors, in addition to stewards. It might also study more objective measures like the number of grievances filed, the resolution of jobsite conflicts, increasingly effective contract enforcement, expanded organizing activity, and other related factors.

Based on evaluation forms submitted by stewards who have participated in the program, as well as informal discussions with trainers, business representatives, and stewards throughout the union, the results of a more systematic evaluation of changed attitudes are likely to be positive. Stewards are pleased to participate in the training; and their spirits and morale seem to be elevated by the program.<sup>22</sup>

In the final analysis, the effectiveness of the UBCJA's Comprehensive Construction Steward System will be revealed on jobsites throughout the industry. The union views the steward program as an integral part of its strategic response to the open shop. If a growing cadre of well-trained stewards participates more actively in the union's renewal, the United Brotherhood Carpenters and Joiners of America will judge its steward program to be a success.

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<sup>22</sup> A full evaluation of field reports by UBCJA is in progress.

## **Appendix A: Description of Eight Training Segments**

### Training Segment #1: “Team Building”

- Introduction to Steward Training
- Crisis in B&CT and UBCJA Strategic response
- Duties of Business Representative
- Local Unions a Team
- Roles and Responsibilities of Union Steward

### Training Segment #2: “Collective Bargaining and Contract Administration”

- Nature of Collective Bargaining Process
- Structure and Function of Union Contract
- Role of Union Steward in Contract Enforcement
- Using the Contract

### Training Segment #3: “Legal Rights and Obligations/Jurisdiction”

- Structure of Labor Law
- Legal Rights of Stewards
- Protecting the Local Union
- Trade Jurisdiction

### Training Segment #4: “Union Benefits”

- Principles of Union Benefits
- Local Union Package
- Role of Steward

### Training Segment #5: “Health and Safety”

- Industry Hazards
- OSHA and Legal Protections
- Responding to Jobsite Hazards

### Training Segment #6: “Brotherhood History”

- Reasons to Study History
- Highlights of UBCJA Past
- Lessons of Past for the Future

### Training Segment #7: “Organizing”

- Mission of Union
- Need to Organize New Members
- Role of Steward in Organizing

### Training Segment #8: “Effective Communication”

- Communication Model
- Communication Skills, including Listening
- Steward Communication Arenas

## Appendix B: Statistical Analysis

### A. Group I —Untrained Stewards

### Group II —Trained Stewards

#### Knowledge Part I (KPI)

|                    | Group I | Group II |
|--------------------|---------|----------|
| Number of Cases    | 50      | 44       |
| Mean               | 9.7400  | 11.2500  |
| Standard Deviation | 2.783   | 3.648    |
| Standard Error     | 0.394   | 0.550    |

F Value                    1.72  
 2-Tail Prob.                0.063

Pooled Variance Estimate:

Separate Var. Estimate:

T Value                    -2.27  
 Degrees of Freedom        92  
 2-Tail Prob.                0.025

T Value                    -2.23  
 Degrees of Freedom        79.93  
 2-Tail Prob.                0.028

#### Knowledge Part II (KPII)

|                    | Group I | Group II |
|--------------------|---------|----------|
| Number of Cases    | 50      | 44       |
| Mean               | 3.1000  | 2.8864   |
| Standard Deviation | 1.717   | 1.553    |
| Standard Error     | 0.243   | 0.235    |

F Value                    1.21  
 2-Tail Prob.                0.519

Pooled Variance Estimate:

Separate Var. Estimate:

T Value                    0.63  
 Degrees of Freedom        92  
 2-Tail Problem              0.531

T Value                    0.63  
 Degrees of Freedom        91.90  
 2-Tail Problem              0.529

**B. Group I—Untrained Stewards****Group IIa—Trained Stewards  
Teaching Team A****Knowledge Part I (KPI)**

|                    |  | <b>Group I</b> | <b>Group IIa</b> |
|--------------------|--|----------------|------------------|
| Number of Cases    |  | 50             | 24               |
| Mean               |  | 9.7400         | 11.9167          |
| Standard Deviation |  | 2.783          | 3.717            |
| Standard Error     |  | 0.394          | 0.759            |

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|                           |       |                         |       |
|---------------------------|-------|-------------------------|-------|
| F Value                   | 1.78  |                         |       |
| 2-Tail Prob.              | 0.090 |                         |       |
| Pooled Variance Estimate: |       | Separate Var. Estimate: |       |
| T Value                   | -2.82 | T Value                 | -2.55 |
| Degrees of Freedom        | 72    | Degrees of Freedom      | 35.83 |
| 2-Tail Prob.              | 0.006 | 2-Tail Prob.            | 0.015 |

**Knowledge Part II (KPII)**

|                    |  | <b>Group I</b> | <b>Group IIa</b> |
|--------------------|--|----------------|------------------|
| Number of Cases    |  | 50             | 24               |
| Mean               |  | 3.1000         | 2.9583           |
| Standard Deviation |  | 1.717          | 1.628            |
| Standard Error     |  | 0.243          | 0.235            |

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|                           |       |                         |       |
|---------------------------|-------|-------------------------|-------|
| F Value                   | 1.11  |                         |       |
| 2-Tail Prob.              | 0.802 |                         |       |
| Pooled Variance Estimate: |       | Separate Var. Estimate: |       |
| T Value                   | 0.34  | T Value                 | 0.34  |
| Degrees of Freedom        | 72    | Degrees of Freedom      | 47.74 |
| 2-Tail Problem            | 0.737 | 2-Tail Problem          | 0.732 |

**C. Group I—Untrained Stewards****Group IIb—Trained Stewards  
Teaching Team B****Knowledge Part I (KPI)**

|                    | <b>Group I</b> | <b>Group IIb</b> |
|--------------------|----------------|------------------|
| Number of Cases    | 50             | 20               |
| Mean               | 9.7400         | 10.45            |
| Standard Deviation | 2.783          | 3.486            |
| Standard Error     | 0.394          | 0.780            |

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F Value            1.57  
2-Tail Prob.        0.207

Pooled Variance Estimate:

T Value            -0.90  
Degrees of Freedom    68  
2-Tail Prob.        0.374

Separate Var. Estimate:

T Value            -0.81  
Degrees of Freedom    29.19  
2-Tail Prob.        0.423

**Knowledge Part II (KPII)**

|                    | <b>Group I</b> | <b>Group IIb</b> |
|--------------------|----------------|------------------|
| Number of Cases    | 50             | 20               |
| Mean               | 3.1000         | 2.8000           |
| Standard Deviation | 1.717          | 1.508            |
| Standard Error     | 0.243          | 0.337            |

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F Value            1.30  
2-Tail Prob.        0.545

Pooled Variance Estimate:

T Value            0.68  
Degrees of Freedom    68  
2-Tail Problem        0.497

Separate Var. Estimate:

T Value            0.72  
Degrees of Freedom    39.69  
2-Tail Problem        0.475

**D. Group IIa—Untrained Stewards  
Teaching Team A**

**Group IIb—Trained Stewards  
Teaching Team B**

**Knowledge Part I (KPI)**

|                    | <b>Group IIa</b> | <b>Group IIb</b> |
|--------------------|------------------|------------------|
| Number of Cases    | 24               | 20               |
| Mean               | 11.9167          | 10.45            |
| Standard Deviation | 3.717            | 3.486            |
| Standard Error     | 0.759            | 0.780            |

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|              |       |
|--------------|-------|
| F Value      | 1.14  |
| 2-Tail Prob. | 0.784 |

Pooled Variance Estimate:

Separate Var. Estimate:

|                    |       |
|--------------------|-------|
| T Value            | 1.34  |
| Degrees of Freedom | 42    |
| 2-Tail Prob.       | 0.187 |

|                    |       |
|--------------------|-------|
| T Value            | 1.35  |
| Degrees of Freedom | 41.38 |
| 2-Tail Prob.       | 0.185 |

**Knowledge Part II (KPII)**

|                    | <b>Group IIa</b> | <b>Group IIb</b> |
|--------------------|------------------|------------------|
| Number of Cases    | 24               | 20               |
| Mean               | 2.9583           | 2.8000           |
| Standard Deviation | 1.628            | 1.508            |
| Standard Error     | 0.332            | 0.337            |

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|              |       |
|--------------|-------|
| F Value      | 1.17  |
| 2-Tail Prob. | 0.741 |

Pooled Variance Estimate:

Separate Var. Estimate:

|                    |       |
|--------------------|-------|
| T Value            | 0.33  |
| Degrees of Freedom | 42    |
| 2-Tail Problem     | 0.741 |

|                    |       |
|--------------------|-------|
| T Value            | 0.33  |
| Degrees of Freedom | 41.50 |
| 2-Tail Problem     | 0.740 |