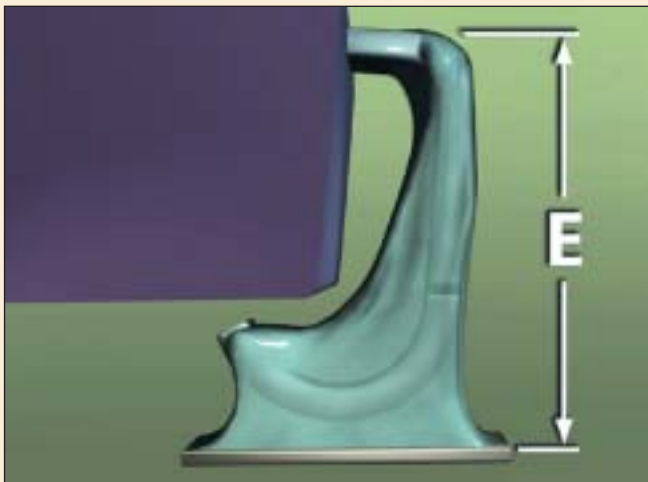


# Process Control for IPC Certification Programs

In 1995, IPC responded to member requests for a formal industry-traceable training and certification program for electronic assembly acceptance. U.S. Department of Defense (DoD) certification programs, which focused on relatively small users groups, were cancelled.

At that time, IPC-A-610 was gaining in popularity by the electronics assembly industry. Companies needed a course that would allow them to easily train many workers on the document's requirements. Rather than develop a course internally, companies were excited by IPC's offer to develop the course. IPC worked with a consortium of academia and training companies that had experience in the now-defunct DoD programs to develop the first program. Credibility of the program was considered paramount and required industry involvement. A committee of industry (user) representatives directed and formally approved the technical content and another committee (also comprised of industry representatives) established administrative policies and procedures.



Training visual from IPC-A-610 Program

"Participating in an industry-developed course facilitates ISO certification and shows potential customers that the company is serious about quality," stated **Jack Crawford**, IPC's director of certification.

The IPC-A-610 training and certification program was the first of what are now five industry-traceable programs that support industry accepted standards, each of which follows a two-tier "train-the-trainer" concept. First, companies send an instructor candidate to an authorized IPC training center. Upon successful completion of the course, that individual becomes a certified instructor and is provided, as part of the tuition cost, the materials needed to train and certify application level users, such as operators, inspectors, and members of management teams.

Three of IPC's certification programs reinforce discrimination skills—see it, hear it, read it, write it and apply it—and support the visual acceptance criteria in IPC-A-600, *Acceptability of Printed Boards*, IPC-A-610, *Acceptability of Electronic Assemblies*, and IPC/WHMA-A-620, *Requirements and Acceptance of Cable and Wire Harness Assemblies*.

In addition to the discrimination skills, the other two programs provide another critical aspect—hands-on skills. The workmanship programs for J-STD-001, *Requirements for Soldered Electrical and Electronic Assemblies*, and IPC-7711A/7721A, *Rework, Repair and Modification of Electronic Assemblies*, require hands-on training and skills-demonstration by the student.

Today, each program has four components:

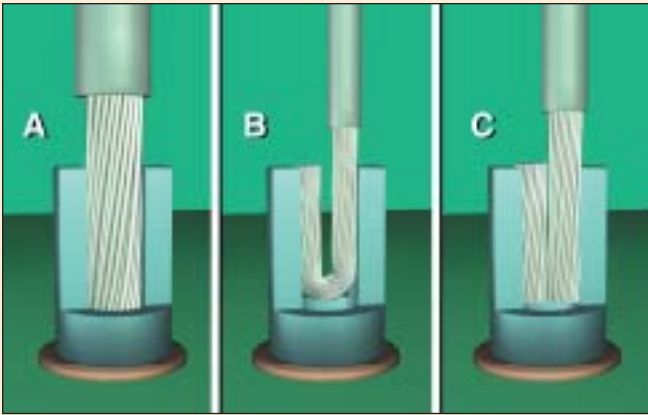
1. Certify the trainer at IPC authorized training centers.
2. Recertify the trainer at IPC authorized training centers.
3. Certify the application specialist by certified trainers or IPC authorized training centers.
4. Recertify the application specialist by certified trainers or IPC authorized training centers.

These programs include a critical element not available from online, video or computer-based training—full interaction with a knowledgeable, credible instructor to immediately resolve comprehension issues. While no IPC document requires participation in an IPC training program to use the standard, customers frequently require that vendors have completed a certification program to ensure their products have gone through rigorous quality control. Use of industry traceable training also greatly facilitates ISO certification that has become important in international trading.

Nearly 7,000 instructors have been certified since the programs were introduced, and they have, in turn, trained and certified more than 50,000 application specialists. These programs are being used in virtually every country in the world that has an electronics manufacturing industry.

As these programs began to mature through document revision and course updates, subtle differences in policies and administration became hard to manage—by both IPC and the greatly expanded user base that is using multiple programs.

To bring things back in line, IPC set up a Blue Ribbon Training and Certification Advisory Committee in early 2003 to establish common policies and procedures. As a Blue Ribbon committee, the members were hand-picked from a very diverse group of users and suppliers so that it included a mix of more- and less-experienced IPC program users from large and small industries, building Class 1, 2 and 3 prod-



Training visual from IPC/WHMA-A-620 Program

ucts and training companies with experience in both IPC and other training programs. Ultimately, 10 user companies and six training companies accepted IPC's invitation to participate in this effort, including:

- **Floyd Bertagnolli, Celestica Asia, Inc.**
- **Donna Briggs, Amphenol**
- **Becky Buzard, Pemstar**
- **Jim Jenkins, Harris Corporation**
- **Gary Latta, NSWC Crane**
- **Mary Muller, Eldec Corporation**
- **D. J. Roberts, Motorola Inc.**
- **Teresa M. Rowe, AAI Corporation**
- **Blen F. Talbot, L-3 Communications**
- **Eric Wolf, Mack Technologies, Inc.**
- **Jeff Ferry, Circuit Technology Center Inc.**
- **Leo P. Lambert, EPTAC Corporation**
- **Ken A. Moore, Omni Training Corp.**
- **Mel Parrish, Soldering Technology International**
- **Guy M. Ramsey, ACI/EMPF**
- **William A. Westmoreland, B E S T Inc.**

After much effort, this committee finally reached consensus on a very comprehensive document. Following legal review, IPC Professional Training and Certification Policies and Procedures was approved by IPC President **Denny McGuirk** in October 2003.

### Summary of Certification Program Policies and Procedures

Following is a limited summary covering important parts of the updates, policies and procedures for IPC Professional Training and Certification Programs.

**Certification Credentials are Portable**—IPC certification is conveyed upon an individual in the same manner as a degree from a college or trade school and the certificate is the individual's property. The individual's certificates may be freely copied for company training and audit records and the certification is valid through the entire certification period, even if employment changes.

**Individuals are Certified**—Only individuals are certified, not companies. While it is acceptable to promote that a company has certified workers, it is not appropriate to state that a company is IPC certified.

**Certification Period**—All programs now have a certification period of two years for both trainers and application specialists, whether through initial certification or recertification.

**Titles**—Instructors in all programs are now identified as Certified IPC Trainers. Gone are such terms as Class A or Registered Instructor. Application specialists, previously identified as operators, worker proficiency, inspectors, etc., are now identified as Certified IPC Specialists.

**Certificates and Formal Credentials**—New certificates have been developed for trainers and application specialists. The certificates for instructor certification, which are granted by IPC, include the following statement (with the signatures of the IPC president and director of certification):

*This certificate is your formal notification of meeting all the necessary requirements to be a Certified IPC Trainer (CIT) in the industry developed and approved <program name>. You may now use the CIT designation on letterhead, business cards, and all forms of address. Authorization to convey Application Level certification is granted, and continuing certification status of the instructor is conditioned on providing the training and skills assessment using the industry approved IPC Training Materials in accordance with and to the requirements of the IPC Training and Certification Policy.*

Application specialist certification is granted by the CIT. Certificates include the following statement:

*This certificate is your official notification of meeting all the necessary requirements to be a Certified IPC Specialist (CIS) in the industry developed and approved <program name>. You may now use the CIS designation on letterhead, business cards and all forms of address.*



Training visual from IPC-A-600 Program

**Certification Extensions**—Sometimes workload or training schedules preclude timely recertification. IPC's director of certification may grant a maximum 90-day extension of a CIT certification. CITs may grant a maximum 90-day extension to a CIS if permitted by the company's policies.

**Challenge Testing**—Individuals with a strong background in standard content and/or a high level of workmanship experience may elect

*Continued on next page*

# IPC Certification (Cont. from previous page)

to earn certification by taking the same skill measurement tests that are administered to individuals taking classroom training. In some cases, there are prerequisites that must be met before challenge testing can be administered. The skill measurement tests must be administered and proctored by a Certified IPC Trainer or Master Instructor. IPC will not recognize any certification issued after October 2003 that was not proctored by an IPC instructor, such as mail-a-cert, or any other certification without an official IPC certificate. There are no IPC approved "equivalent" training programs.

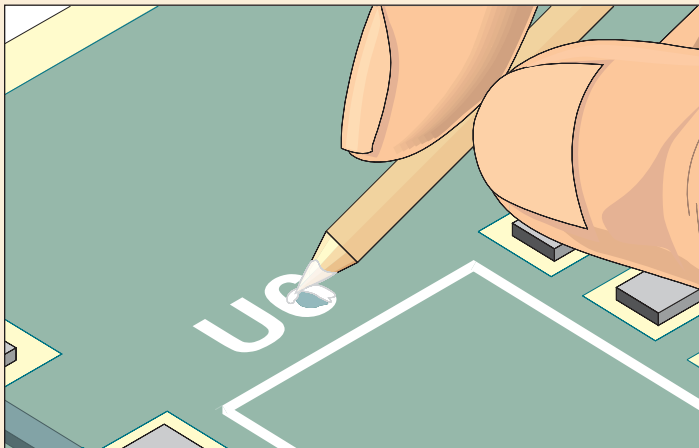
## Online Training—Online training is:

1. Not approved for initial instructor training in discrimination skills courses (IPC-A-600, IPC-A-610, IPC/WHMA-A-620)
2. Not approved for instructor or application level initial or recertification in workmanship skills courses (IPC-7711A/7721A, J-STD-001)

Fully interactive (web conference or video conference) online training is:

1. Acceptable for instructor recertification only in discrimination skills courses (IPC-A-600, IPC-A-610, IPC/WHMA-A-620)
2. Acceptable for application level initial or recertification in discrimination skills courses (IPC-A-600, IPC-A-610, IPC/WHMA-A-620)

IPC is in the process of developing updated policies and procedures course modules and will provide this material to all currently certified trainers in early 2004. All certificates have been updated and can now be ordered. All certificates that are shipped include a copy of the new Policies and Procedures document.



Training visual from IPC-7721 Program

Crawford noted that "the Blue Ribbon Advisory Committee offered a number of additional recommendations that IPC is in the process of implementing. The most significant change is to the student handbooks."

The committee advised that trainers prefer to have the student's eyes looking at the full-color training aids on the projector screens rather than at small black and white pictures in the books. Several other concerns were expressed regarding document control, where the student workbooks may end up on the production floor and workers would use them instead of the approved standard. The final comment had to do with review questions—trainers don't want students looking at the review questions in a handbook during the training session.

For those reasons, all student handbooks are being modified to remove display slides and in the future will be provided "loose-leaf," so that instructors can disseminate the review questions and project forms on their own schedule. A single certificate and these student training materials will be

available in a shrink-wrap package with quantity pricing. The cost of the certificate/training material includes a periodic license fee for participation in the IPC certification programs and to defray costs of program updates and maintenance.

Finally, IPC is responding to the industry's requests to have Continuing Education Units for IPC courses and to provide one-stop shopping for all training materials, including workmanship boards, components and terminals. IPC has been working with a number of IPC authorized training companies that sell workmanship training materials and IPC members will be able to order them directly from IPC by this spring. Additionally, IPC is pursuing a process to be able to provide the CEUs.

IPC Training and Certification Programs truly are used worldwide. Currently, there are 24 authorized training centers in the U.S. and 13 international training centers. Additionally, seven companies have established their own corporate-wide certification centers, most with Master Instructors at multi-national sites.

More information about these and other IPC programs, such as EMS Manager Certification and IPC Designer Certification, is available online at [www.ipc.org/certification](http://www.ipc.org/certification). Questions on IPC's professional training and certification programs should be e-mailed to [certification@ipc.org](mailto:certification@ipc.org) and they'll be answered by Crawford or **Lauren Davidson**. □

## U.S. Training Sites

ACI/EMPF	Motorola
ACME, Inc.	Omni Training Corp.
BEST, Inc.	Pace, Inc.
BlackFox Training Institute	Quality Technology Company
Circuit Technology Center	Soldering Technology International
Circuit Technology, Inc.	Teamsource
EPTAC Corporation	Trace Laboratories
ETA	Training & Certification Specialist (TCS)
Gwinnett Technical Institute	Tyco Electronics Inc
Ivy Tek	Verion Training
Manufacturing Technology Training Center	Weeks Planning, Inc.
Microtek Labs	

## International Training Sites

Advanced Rework Technology A.R.T. (England)	Hytec (Denmark)
AMS (Ireland)	Istituto Italiano della Saldatura (Italy)
ATEK Training Services Ltd. (Ireland)	PIEK International Education Center (The Netherlands)
Dalus, S.A. de C.V. (Mexico)	Sincotron Sverige (Sweden)
Electronics Yorkshire (England)	Skaanning Quality & Certification (Denmark)
Ensil Canada Ltd. (Canada)	SMCBA (Australia)
Hong Kong Productivity Council (Hong Kong)	ZVE (Germany)

## Corporate Training Sites

Celestica International	Pemstar
Delta Air Lines	Solectron
Honeywell	Teradyne
Lockheed Martin	