I. Construction Innovation Forum • NOVA Award Nomination

Instructions

Step 1 Enter a Descriptive Name for the Process/Method/Technique you are nominating on line A of this page.

Step 2 Complete this page,
"I. Construction Innovation Forum • NOVA Award Nomination"
a. Be sure to provide original signatures in Section B and E on this page. Your nomination cannot be reviewed without them.
b. If you need additional space for names and addresses you may attach additional pages for names and address information. You may attach extra pages only for sheet I.

Step 3 "II - Innovation Description" — attach one (one only) 8-1/2" X 11" page that gives a succinct written description of the innovation. Put the name of the innovation at top of page. Tell us what you think is innovative about ~~this~~. You should include:
- What the innovation is
- Why it is innovative
- What it changed or replaced
- Where and when it originated, has been used, and is expected to be used in the future
- If the nomination is for an innovative project, specifically identify its innovation

Please type, with 1" margins, 10 characters per inch, 6 lines per inch.

Step 4 "III - Innovation Illustration" — attach one (one only) 8 1/2" X 11" page that contains one or more photographs, drawings, tables, graphs, clauses, etc., that visually describe the innovation. Do not submit more than one page of visuals. The jurors will see only one sheet for review. Put the name of the innovation at top of page.

Other You must submit 12 (twelve) sets of sheets I, II and III (a total of 36 pages).

Nominations are due September 15 mailed or delivered to:
The Construction Innovation Forum, 1000 Campus Drive, Suite 100, Ann Arbor, MI, USA 48104-6792, Phone: 313-995-1855, Fax: 313-995-5002

A. Name of Innovation: National Center for Construction Education & Research

B. Person(s) and /or Organization(s) Primarily Responsible for the Innovation (Those to whom the NOVA Award should be presented.)

Name	Daniel J. Bennet	Ronald Fedrick, Chair	Joe Ivey, Vice-Chair
Title	President	President & CEO	President & CEO
Affiliation	NCCER	Nova Group Inc.	Ivey Mechanical Co.
Address	1300 N. 17th	Box 4050	Box 610
	Arlington, VA 22209	Napa, CA 94558	Kosciusko, MS 39090
Phone	703-812-2001	707-257-3200	601-289-3646
Signature	Don Bennet	Ron Fedrick	Joe Ivey

(Signature(s) indicate acceptance of the nomination and consent to have CIF research and make presentations on the innovation for the purpose of jurying and publicizing awards.)

C. Other Primary Sources of Information on the Innovation: (in addition to the persons nominated above.)

Name	Michael Dunbar	Steve Greene	
Title	Asst. to the Pres.	VP, Operations	
Affiliation	NCCER	NCCER	
Address	1300 N. 17th	Box 141104	
	Arlington, VA 22209	Gainesville, FL 32614	
Phone	703-812-2002	352-379-1711	

D. Independent Reference(s) familiar with the use of the Innovation

Name	Dr. Robert Cox		
Title	Asst. Professor		
Affiliation	University of Florida/Rinker School of Building Construction		
Address	Box 115703		
	Gainesville, FL 32611		
Phone	352-392-5965		

E. Person(s) making nomination:

Name	Michael Dunbar		
Title	Asst. to the Pres.		
Affiliation	NCCER		
Address	1300 N. 17th		
	Arlington, VA 22209		
Phone	703-812-2002		
Signature	Michael E. Dunbar		

(Signature(s) indicate familiarity with the the innovation and signify that information contained in the nomination is correct to the best of one's knowledge.)

THE NATIONAL CENTER FOR CONSTRUCTION EDUCATION & RESEARCH is transforming craft training from proprietary business development tools into a unified, industry-wide initiative; funding development of state-of-the-art training materials updated annually to reflect the latest technology; and creating a multimillion-dollar mechanism that ensures high quality training is delivered to the job site that provides workers with new and rewarding career opportunities.

The U.S. Labor Department estimates that construction must attract and train 240,000 new workers each year to meet this nation's building needs. But for too long the industry neglected to address recruitment and training in a unified, sufficiently funded and concerted effort. As a result, the average craft worker's age is 47 and continues to rise as fewer young men and women choose careers in construction. All too often those who do enter the industry fail to receive even the basic skills needed to begin successful, productive careers. Without a dramatic and innovative action, the construction industry faces a work force crisis of unparalleled proportion.

Just such dramatic action is being taking by the National Center, which is aggressively tackling construction's most critical problem -- ensuring that contractors have highly skilled, motivated workers to meet their clients' most stringent needs safely, economically and productively.

In 1991, Associated Builders & Contractors and 11 major U.S. contractors merged their tightly guarded training materials for five crafts into a single "standardized" program. The purpose was to give craft workers not only state-of-the-art training but portable skills leading to a clearly defined career path. The $2 million "fast-track" project was completed in 18 months. Besides standardizing curricula, certification programs were created for master trainers, craft instructors and training centers that ensure the highest quality level of instruction. A national registry provides workers with transcripts and maintains permanent training records. Because of the success of this initial effort, the Center decided to expand standardization to 16 additional crafts late in 1993.

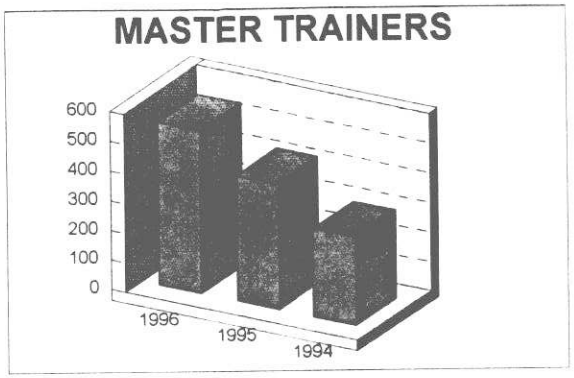
Adequate funding for this massive undertaking was critical. Three sources were identified and five-year goals set for each: raise a $20-million endowment fund; reach $5 million in annual sales; and, collect $3 million a year in cents-per-employee-hour-worked contributions from contractors and the user community.

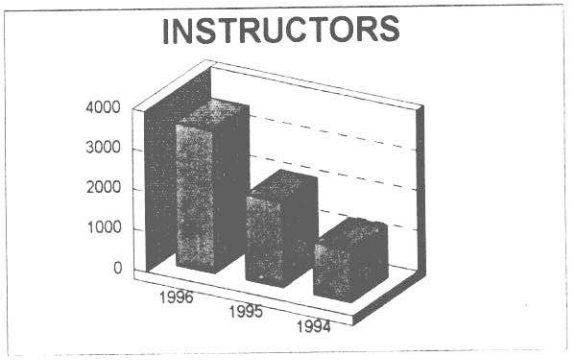
While that funding level allows the Center to produce world-class training programs it does not ensure delivery at the local level. To accomplish that goal the Center had to become truly an industry-wide effort, uniting contractors, construction associations and this nation's educational system. Therefore, the National Center was incorporated in the Commonwealth of Virginia as a non-profit educational foundation totally independent from ABC or any other industry group.

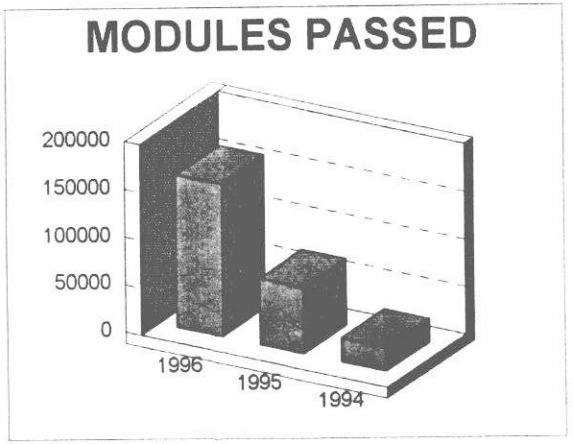
Support has been overwhelming. With almost $13 million raised, the five-year $20-million goal will be reached in four. Sales in 1995 were $3 million, ahead of schedule and growing at 30% annually. The Business Roundtable's endorsement is driving cents-per-hour contributions to far exceed its goal. The open shop has for the first time an ongoing vehicle to fund training. Fourteen associations are enthusiastic partners and have contributed curricula and expertise. Over 300 school districts use the curricula in vocational and school-to-work programs. The Center has certified 550 master trainers and 3,500 craft instructors, who have taught over 150,000 modules. Already, more than 40,000 students use the curricula. All numbers grow significantly daily. To move training into the 21st century, the Center has released its first CD-ROM computer-based training programs, and with its affiliate, the University of Florida, is developing distance learning technology to provide even greater access to craft training.

The National Center is well down the road toward its goal of "One Industry, One Training Program" that will attract, train and retain the motivated, skilled workers essential for a safe, productive and cost-effective U.S. construction industry.

National Center for Construction Education & Research





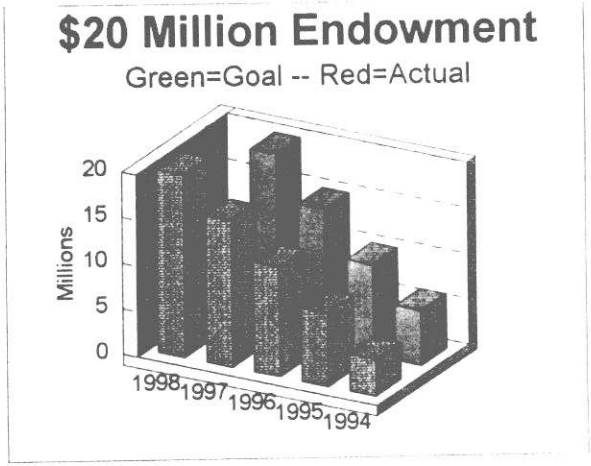


Parterning Organizations

American Fire Sprinkler Association
American Society for Training & Development
American Vocational Association
American Welding Society
Associated Builders & Contractors
Carolinas AGC
Carolinas Electrical Contractors Association
Construction Industry Institute
Idaho Branch - AGC
Merit Contractors Assn. of Canada
Metal Building Manufacturers Association
National Assn. of Minority Contractors
National Assn. of Women in Construction
National Insulation Association
National Utility Contractors Association
National VoTech Honor Society
Painting & Decorating Contractors of America
Prentice Hall Publishing
US Army Corps of Engineers
Vicom

Major Contributors

3M
ABC Texas Gulf Chapter
Adena Corporation
Austin Industries
BE&K
BEC/allwaste
Becon
Bell Corp.
Brasfield & Gorrie
Brice Building
Brown & Root
John Brown E&C
Caddell Construction
Cajun Contractors
Carolinas AGC
Carolinas Electrical Contractors Assn
Caterpillar
Central Sprinkler
Clark Construction Group
Contractors Northwest
James Craft & Son
DBI/Sala
Danis Companies
Delta Diversified Enterprises
Fluor Daniel
Gaylor Electric
Grinnell Fire Protection
Gulf States
Harbert-Yeargin
Hardin Construction Gp.
The Haskell Co.
Helix Electric
Hess Mechanical
Hoar Construction
Irby Construction
Ivey Mechanical
Jack Jennings & Sons
J.A. Jones
KCI
Kamtech
Lake Mechanical
Lowder Construction
Manitowoc Crane
Masonry Arts
Miller & Long
Nova Group
Paul Risk & Associates
Riviera Electric
Robins & Morton
Rogers-O'Brien
Runnebohm Construction
Rust Constructors
S&B Engineers & Constrs.
Sanders Brothers
Sherwin-Williams
Shiel Sexton
Suitt Construction
Sundt Corp.
TDIndustries
TIC/The Industrial Co.
Town & Country Electric
Tri-City Electrical
Trinity Contractors
R.L. Turner Corp.
U.S. Contractors
Underground Construction
Vicom
Dan Vos Construction
Vos Electric
Wayne Auto. Fire Sprinklers
Westra Construction
Wiginton Fire Sprinklers
Williams Learning Network
Willmar Electric
Wilson Electric
Wolverine Building
H.B. Zachry
Zignego Co.



INVESTIGATOR'S SUMMARY

Nomination 9714
Investigator: John Everett

NATIONAL CENTER FOR CONSTRUCTION EDUCATION AND RESEARCH

Background Information by John Everett

One of the biggest problems facing the US construction industry today is skilled labor shortages. Demographic projections indicate that this problem will get worse as the work force ages and fewer young people enter the work force. The U.S. Labor Department estimates that construction must attract and train 240,000 new workers each year to meet this nation's building needs. For too long the industry has neglected to address recruitment and training in a unified, sufficiently funded and concerted effort. As a result, the average craft worker's age is 47 and continues to rise as fewer young men and women choose careers in construction. All too often those who do enter the industry fail to receive even the basic skills needed to begin successful, productive careers. Without dramatic and innovative action, the construction industry faces a work force crisis of unparalleled proportion.

For many years, union apprenticeship programs have provided formal training to union craft workers. The non-union sector has not had an industry-wide organized training mechanism. Some large companies provide formal or informal in-house training, others rely on "stealing" workers who have been trained by unions or other non-union companies, and many have no training programs at all.

The Associated Builders and Contractors' (ABC) *Wheels of Learning* program is the closest the non-union sector has come to a standardized training program. *Wheels of Learning* covers 18 different craft categories and maintenance training. It is estimated that more than 500,000 *Wheels of Learning* modules are used across the country each year. A module is typically one booklet covering one topic. A four year training program for carpenters, for example, would consist of roughly 150 hours per year and a total of 37 modules. See Exhibit 1 for details.

While the *Wheels of Learning* program has been successful in training many craft workers through local ABC chapters, there has been a problem in documenting that a worker had received the training when moving from employer to employer, and certifying that the training had been performed by qualified instructors.

In 1991, Associated Builders and Contractors and 11 major U.S. contractors merged their tightly guarded training materials for five crafts into a single "standardized" program. The purpose was to give craft workers not only state-of-the-art training but portable skills leading to a clearly defined career path. The $2 million "fast-track" project was completed in 18 months. Besides standardizing curricula, certification programs were created for master trainers, craft instructors and training centers that ensure the highest quality level of instruction. A national registry provides workers with transcripts and maintains permanent training records. See Exhibit 2 for sample diploma, registration card, and transcript.

This effort was initially conducted by the Construction Education Foundation (CEF), which eventually became the National Center for Construction Education and Research (NCCER), also referred to as the "National Center" or just "Center." The CEF and in its

beginning the NCCER were part of ABC. Because of the success of the initial effort, the NCCER decided to expand standardization to 16 additional crafts late in 1993.

Adequate funding for this massive undertaking was critical. Three sources were identified and five-year goals set for each: raise a $20-million endowment fund; reach $5 million in annual sales; and, collect $3 million a year in cents-per-employee-hour-worked contributions from contractors and the user community.

While that funding level would allow the NCCER to produce world-class training programs it did not ensure delivery at the local level. To accomplish that goal, the NCCER had to become truly an industry-wide effort, uniting contractors, construction associations and this nation's educational system. Therefore, the NCCER was incorporated in the Commonwealth of Virginia as a nonprofit educational foundation totally independent from ABC or any other industry group.

Support has been overwhelming. With almost $13 million raised (see Exhibit 3 for list of companies and pledges), the five-year $20-million goal will be reached in four. Sales in 1995 were $3 million, ahead of schedule and growing at 30% annually. The Business Roundtable's endorsement is driving cents-per-hour contributions to far exceed its goal (more about this below). The open shop has for the first time an ongoing vehicle to fund training. Fourteen associations are enthusiastic partners and have contributed curricula and expertise. Over 300 school districts use the curricula in vocational and school-to-work programs. The Center has certified 550 master trainers and 3,500 craft instructors, who have taught over 150,000 modules. Already, more than 40,000 students use the curricula. All numbers grow significantly daily.

To move training into the 21st century, the NCCER has released its first CD-ROM computer-based training programs, and with its affiliate, the University of Florida, is developing distance learning technology to provide even greater access to craft training.

The Innovation

There appears to be no question that the NCCER is addressing a major problem in construction and that there is potential to have a major positive impact on the industry and the country.

Two questions need to be answered: 1.) What is innovative about the NCCER? and 2.) How successful has the NCCER been in producing highly skilled craft workers?

This investigator asked Mr. Dan Bennet, president of NCCER, what he thought was innovative. Mr. Bennet responded in writing; a copy of the full letter is shown in Exhibit 4. Mr. Bennet's five main points are:

1. Contractors and their associations have long recognized the critical need to provide their workers will high quality craft training. Since the early 1970s the number of these programs has multiplied and while many were effective, the net result has been an educational "Tower of Babel." Both contractors and construction industry associations have viewed their individual training programs as highly proprietary business development tools; in the case of contractors, to attract and retain clients; and in the case of their associations, to attract and retain members. Several previous efforts to unite the industry under a single banner have failed. The first major innovation of the National Center was to create and adequately fund a non-partisan, industry-wide training organization that allowed contractors and associations to combine and standardize existing training programs into a single, world-class program equally available to all

within the industry. The National Center has made craft training an industry effort rather than numerous proprietary tools used to gain a sales advantage.

2. The critical need for the construction industry to attract and retain the work force it must have to remain competitive and provide quality services to its clients has long been hampered by a lack of a true career path for its skilled craft workers. Skills learned from one contractor or association training program were not easily transferable to other contractors, and no industry group could provide universally accepted documentation of the training an individual worker had achieved. The second major innovation that the National Center has accomplished is the creation of the National Registry of Craft Workers to provide craft workers with permanent documentation, accepted nationally, of the skills they have mastered within a standardized training program. To ensure that training remains uniform across the country, the National Center certifies instructors, training sites and programs that teach a uniform curriculum.

3. Adequate funding has truly been the "Achilles Heel" of open shop construction for many decades. In 1982, The Business Roundtable warned that unless a method was found to fund contractor training programs, the open shop would suffer severe consequences in terms of safety, productivity and cost-effectiveness. Until recently, such a funding mechanism has eluded the open shop, and industry training efforts, as well as its employees, have suffered. The third major innovation of the National Center has been the creation and rapidly growing acceptance of a "Training and Education Service Agreement" to provide participating contractors with a constant source of funds with which to train their workers and maintain the highest level of instructional materials.

4. As the construction process becomes more sophisticated and complex, the need for skilled craft workers with highly developed technical skills is increasingly important. In a very short time, a heavy equipment operator, for example, will have to be a better computer technician than a driver. Construction is becoming high tech and therefore demands a high tech work force. Until the National Center, no other industry group or training organization had the initiative or the resources to move construction craft training technology forward into the 21st century to attract the high tech workers this industry must recruit. The fourth major innovation of the National Center is the creation of 21st century training technology that will attract highly technical skilled workers into construction. The National Center has begun the process of converting all of its 55,000 pages of craft training materials into computer-based interactive video training programs on CD-ROM.

5. Perhaps our most important innovation is that the National Center is truly revolutionizing the way the open shop construction industry trains it workers so that contractors can take full advantage of the exciting new advances in technology you honor each year.

Implied but not mentioned directly by Mr. Bennet, but perhaps the most difficult challenge in all of this has been the bringing together of so many people and organizations that have historically been in competition with each other and very protective of their own turf and training materials, a then to get them to make a financial commitment.

It must be noted that the NCCER did not invent or develop (nor do they claim so) *Wheels of Learning,* transcripts for documentation of education, CD-ROM based training, or cent-per-hour contributions for training.

The "Training and Service Agreement" mentioned in Mr. Bennet's point #3 above refers to an agreement between the NCCER and a contractor. Signatory contractors voluntarily pledge to contribute 15¢ per craft man-hour for training. The model agreement allocates 13¢ per man-hour to a company account in a national trust fund. The remaining 2¢ per hour goes to support the NCCER's activities. Signing the agreement will remain voluntary and will not affect a contractors'' use of the Wheels of Learning curricula. The 15¢ is slightly higher than the typical cents-per hour contributions for training for union agreements. See Exhibits 5 and 6 for more details.

Investigator's summary

Back to the two questions.

What is innovative about NCCER?

The NCCER is helping find wider application of several existing practices. By standardizing and documenting training, they are serving an important educational function. These by themselves do not represent significant innovations. However, in the big picture, NCCER has performed a minor miracle where numerous previous attempts have failed. They have succeeded in bringing together many competing organizations and created and (this is where the rubber meets the road) funded an organization that is may be in the process of revolutionizing the way nonunion craft training takes place. NCCER has made or is in the process of making their training programs truly nation-wide and industry-wide. This brings up the second question.

How successful has the NCCER been in producing highly skilled craft workers?

This must be the standard by which the NCCER's success and impact is measured. It is not entirely clear how many workers have actually been trained under the new NCCER *Wheels of Learning* program as compared to how many were already being trained under the old ABC *Wheels of Learning*. Both the NCCER and the union sector have been somewhat evasive with their numbers, so it is difficult to compare the magnitude of their efforts and successes. Mr. Robert Gasperow's interview raises an important issue: He feels the NCCER is a step in the right direction, but so far there is no evidence that they can produce a significant number of workers who are as well qualified or skilled as union trained workers. Along the same line, the first sentence of the last paragraph of an October 21, 1996 *ENR* editorial (see Exhibit 7) states, "The industry may be on the threshold of a major achievement." Prof. Dan Kruger feels strongly that NCCER has not accomplished anything and that giving them the award "would make a mockery of the NOVA Award."

Selected Interview Summaries

Dan Bennet
President, NCCER
Phone interviews by John Everett

Q: The background information says 160,000 training modules were completed in 1996. How many individual workers does this represent? (This issue is raised by another interviewee, Robert Gasperow)

A: Mr. Bennet does not have a firm number for how many workers have been trained under the program. There is no standard method of taking the modules. Some workers start at the beginning and work their way step by step through a full four year, four level sequence. Some companies send workers for a specific set of modules, for example 10 HVAC modules, 5 electrical modules, and 2 welding modules. They do not care about getting the full journeyman training in any one area.

Mr. Bennet explained that the 160,000 modules they are counting means the worker has not only passed the written exam for the certified curriculum, but has done so under a NCCER certified instructor, has demonstrated competency in the field under a NCCER certified instructor, and has had the training documented in the National Registry of Craft Workers.

Mr. Bennet said that whatever the number of workers there are represented in the 160,000 modules, there are at least 20 times that number who have received training but have not reported it and are not registered. Some of these workers train themselves (anyone can purchase the books) and some receive training at vocational schools who do not report the training to the NCCER. But much of the lack of reporting comes from companies who do not want their workers documented. The companies fear that documented workers will be hired away by competitors for an extra ten cents per hour. That, he says, is a shame.

Q: How and where is the training delivered?

A: Most training is performed by individual companies or by local chapters of ABC or other organizations. Training is currently being conducted in about forty states, so it is truly a nation wide effort.

Q: How do the unions feel about all of this?

A: It is not really a union vs. non-union thing. Most of the unions are not their best friends, but that is not a major concern or issue with NCCER. Mr. Bennet says the unions are not doing much training themselves these days anyway. With unemployment rates reaching 80%, why would a union train additional workers?

Q: The background material provided says the NCCER has a "pending partnership" with the Associated General Contractors (AGC). What is the status?

A: If you look at the list of partners, you will see some multi-billion dollar companies who are AGC members. Even they cannot keep their training materials up to date, so they are looking to the NCCER. AGC will become an official partner on March 1, 1997. The delay has been because of political reasons. Mr. Bennet is currently President of ABC, and AGC refused to sign on until Mr. Bennet resigned from ABC. That will happen on March 1, when Mr. Bennet moves to Florida to be full time with NCCER. The contract with AGC has already been signed.

Q: What is the relationship with the University of Florida?

A: Craft training takes place primarily within companies and local member chapters. In addition to craft training, NCCER is promoting management education, image training, safety training, and research. These other areas will be handled through an affiliation with University of Florida. (more info on this subject in interview with Robert Cox)

Phone Interview with Robert Cox
Asst. Professor, University of Florida, Rinker School of Building Construction
by John Everett

Prof. Cox is the liaison between the NCCER and the University of Florida.

U. Florida serves as an academic resource for the NCCER. They are establishing the management education, image, safety, and research functions for NCCER. Craft training is handled by others. The plan is for "Construction Management Academies" which have been held at Clemson University for several years to be brought under NCCER and made available in multiple locations. U. Florida will also help NCCER identify the best method for conducting NCCER sponsored research, develop RFPs, etc., not necessarily to be performed at U. Florida. This effort is just getting started so there is not much to report.

One of their primary missions is to develop additional means of delivering training. They are exploring video, interactive TV, the Internet and World Wide Web for delivering training to remote locations. They are also developing means to recruit young workers into construction by improving the industry image and identifying career. Again, this effort is just getting started. The conversion of the *Wheels of Learning* manuals to CD-ROM is being performed by a separate organization, Vicom.

Investigator's note: Development of "21st century training technology" mentioned in Mr. Bennet's innovation #4 addresses these technologies. NCCER has several CD-ROMs for sale, but clearly the full development of high tech educational technologies is in its infancy.

A staff of about 16 full time employees now work for NCCER in Florida. Several of these have just started as of January 1, 1997.

Robert M. Gasperow
Executive Director, Construction Labor Research Council (CLRC)
phone interview by John Everett

CLRC is a union funded data and statistical information clearinghouse for the construction labor market. Mr. Gasperow is familiar with the NOVA Award. He attended last year's dinner and was very impressed.

Mr. Gasperow was surprised that NCCER was a finalist, or even a nominee for the NOVA Award. He is under the impression that the NOVA Award is given for accomplishment, not for potential. He believes NCCER has not accomplished much yet. He thinks NCCER is still a year or two away from being considered.

The non-union sector correctly recognizes that its number one problem is craft training. They have sucked off about as many union-trained workers as they can.

The NCCER is a step in the right direction, but so far there is no evidence that they can produce a significant number of workers who are as well qualified or skilled as union trained workers.

He thinks the unions are keeping an eye on the NCCER but that the unions are not worried yet. The unions devote $375-400 million per year in training for a minority segment of the industry. This is based on cents-per-hour contributions x workers x hours worked. Even if NCCER reaches its goals of $5 million in annual sales and $3 million in cents-per-hour contributions, it would be a drop in the bucket compared to what the unions have been doing for many years.

He asked how many workers had actually been trained. I told him that NCCER says that 160,000 modules were passed in 1996. He did not know what a module was, but cautioned against equating modules passed with number of trained workers.

Mr. Gasperow concedes that if the NCCER does take off and produce significant numbers of highly trained craft workers, the unions will lose one of the major advantages they now hold over the non-union sector. But, so far, he has not seen anything to indicate that this has happened.

Dr. Dan Kruger
Professor of Labor and Industrial Relations
Michigan State University
phone interview by John Everett

Dr. Kruger is very involved in training issues in the construction industry.
He is quite familiar with the NOVA Award and makes a point of mentioning it when he speaks with industry groups.

He is familiar with the NCCER. He knows they have been successful in raising money. He does not know how many workers have been trained through NCCER.

When told that NCCER had been nominated for the NOVA Award he replied (very emphatically), "What? It would make a mockery of the NOVA Award! They haven't done anything. I'm not impressed."

SELECTED EXHIBITS
Nomination 9714

(1) *Wheels of Learning,* examples

(2) Sample diploma, card, and transcript

(3) NCCER partners and pledges

(4) Bennet letter, Nov. 6, 1996

(5) "Model agreement penned for nonunion training." (W. G. Krizan, *ENR*, 10/21/96)

(6) Training and Service Agreement