North American Manufacturing Research Institution of SME announces

FOURTEENTH NORTH AMERICAN MANUFACTURING RESEARCH CONFERENCE AND ANNUAL MEETING

May 28-30, 1986 • University of Minnesota • Minneapolis, Minnesota, USA

in cooperation with:
Productivity Center, Institute of Technology and Continuing Education and Extension University of Minnesota
CONFERENCE PROSPECTUS
The Fourteenth North American Manufacturing Research Conference (NAMRC XIV) is designed to provide a forum for the presentation and critical discussion of results of basic and applied research in metal working and related manufacturing, and manufacturing automation. The format of the conference is similar to that of NAMRC XII at the University of California in Berkeley. The papers presented at this conference will describe work in the fields of metal forming, metal removal including grinding, machine tools, manufacturing systems, and controls. All papers presented at the conference are contained in the bound conference proceedings and represent work conducted in many of the renowned metal working and manufacturing research centers throughout the world.

The conference sessions will be conducted in an atmosphere that encourages discussion. We urge you to attend and contribute actively.

CONFERENCE LOCATION
The conference site is the Radisson University Hotel, 615 Washington Avenue SE, Minneapolis, Minnesota. The hotel is located in the heart of the University of Minnesota-Twin Cities campus.

REGISTRATION/CANCELLATION FEES
$225 (U.S.) advance registration; $25 (U.S.) at-door registration on May 27 and 28. Fee includes three luncheons, the conference banquet, refreshments, and a bound copy of the conference proceedings. There will be no one-day registration fee nor any reduced fee for authors or session chairs.

Advance registration will be confirmed in writing. A refund, minus a $25 cancellation fee, will be made to those cancelling their registration at least five working days prior to the conference. No refunds will be granted after May 21, 1986. Substitutions will be accepted at any time. For additional information contact Theresa Duty at (612) 379-3188 before April 26, 1986 or (612) 625-5866 after April 26, 1986.

TO REGISTER
Complete and return the registration form provided. Checks/money orders should be payable to the University of Minnesota and mailed to: Registrar, Department of Professional Development, University of Minnesota, 315 Pillsbury Drive, SE, Minneapolis, MN 55455.

LODGING
Blocks of rooms for conference participants have been reserved at the Radisson University Hotel. Attendees should make their own reservations prior to May 6, 1986 by calling (612) 379-8888. To receive special conference room rates ($58/single or double/plus tax), be sure to mention that you will be attending the North American Manufacturing Research Conference.

Following are lodging alternatives located within walking distance of the conference site.
University Cricket Inn
2407 University Avenue SE
Minneapolis, MN 55414
(612) 623-3999
$38.95/single, plus tax
(5 minute walk)

Best Western University Inn
2600 University Avenue SE
Minneapolis, MN 55141
(612) 379-2131
$44/single or double, plus tax
(6 minute walk)

Radisson Hotel Metrodome
1500 Cedar Avenue South
Minneapolis, MN 55404
(612) 333-4646
$68/single, plus tax
(20 minute walk)

AIRPORT TRANSPORTATION
The Radisson University Hotel is served by Minneapolis/Suburban Air-
port Limousine Service, which travels every half-hour on weekdays between
the hotel and the Minneapolis/St.
Paul International Airport (one-way fee: $65). Weekend reservations may be arranged by calling (612) 726-
6400. Taxis are readily available at the Minneapolis/St. Paul Airport. A one-
way (approximately one half-hour) ride costs about $15. Major car rental
agencies are available at the airport also.

PARKING
Conference parking is available in the Harvard Street Ramp for 75 cents per
hour ($4.00 maximum/day). The Har-
vard Street Ramp is adjacent to the Radisson University Hotel. Valet park-
ing is available for hotel guests.

WEATHER AND DRESS
Minnesota, land of 10,000 lakes, usually provides visitor-friendly weather during late May. The average monthly temperature is 68 degrees. Weather is usually sunny, but there can be periods of rain; bring an umbrella. The host hotel is located in the heart of the University of Minne-
sota campus, a busy pedestrian/bus area with many unique shops and
restaurants. Walking shoes and a light jacket will be appropriate for this
environment.

MESSAGES
Incoming messages for conference attendees will be taken by Radisson
University Hotel staff at (612) 379-
8888 and posted on a bulletin board
near the conference registration area.
Sessions will not be interrupted to relay messages.

DISCOUNTED TRAVEL
Special arrangements have been made with Northwest Airlines, a prin-
cipal carrier serving the Twin Cities area, to assist conference participants.
Northwest will guarantee a 35% dis-
count on domestic, full day coach
fares for individuals traveling round-
trip on Northwest. To qualify, reserva-
tions must be made through North-
west’s MEETING SERVICES DE
SK at 1-800-328-7741. You must mention the name of the conference, NORTH
AMERICAN MANUFACTURING
RESEARCH CONFERENCE, to obtain the 35% discount. (In some instances, greater discounts may be obtained
with restricted availability.)
COMPANION ACTIVITIES
Those accompanying participants to the conference may take advantage of the many fine parks, restaurants, museums and shopping areas available in Minneapolis and St. Paul. Each city is accessible by public transportation which stops immediately in front of the Radisson University Hotel.
Several spouses will be available during the program to organize companion tours. Those interested should check the appropriate line on the registration form.

PROCEEDINGS
All registered conference participants will receive one bound copy of the NAMRC XIV proceedings at conference registration. Additional copies may be purchased at the conference or, after June 1, by mail order through the Society of Manufacturing Engineers, One SME Drive, P.O. Box 930, Dearborn, Michigan 48121 USA, (313) 271-1500, ext. 418. The cost per copy is $55 for NAMRI/SME and SME members and $65 for non-members.
TECHNICAL SESSIONS AND PROGRAM

Fourteenth North American Manufacturing Research Conference and Annual Meeting
May 28-30, 1986

TUESDAY, MAY 27
5:00-8:00 p.m. Registration and Reception
Leiby, Radisson University Hotel, 615 Washington Ave., Minneapolis
5:05-8:00 p.m. NAMRI/SME Board of Director's Meeting and Dinner
Radisson Board Room

WEDNESDAY, MAY 28
8:00-9:00 a.m. Breakfast
Leiby, Radisson University Hotel (buffet and coffee service)
9:00-10:00 a.m. General Session
Lila Theater, Coffman Memorial Union
Welcoming Address: Early infant.
Dean, Institute of Technology
University of Minnesota, Minneapolis
Welcome Remarks:
Richard J. Lide
Head, Department of Mechanical Engineering
University of Minnesota, Minneapolis
Interdisciplinary Remarks:
Analou Koun
President, NAMRI/SME
Industrial and Management Systems Engineering Department
Pennsylvania State University, University Park
Opening Address: "Manufacturing Research: Present Status and Future Needs" select
Dr. John C. Shapley, Professor
Department of Mechanical and Aerospace Engineering

Arizona State University, Tempe
10:05-10:30 a.m.
Leiby, Radisson University Hotel
10:30 a.m. - 12:00 Noon
SESSION 1
A. Room A
Co-Chairmen:
D. Thwey, University of Florida, Gainesville, FL
G. Dullman, Oklahoma State University, Stillwater, OK
1. "Face Milling with Silicon Nitride Based Cutting Tools" (E. A. Letcher, Pennsylvania State University, University Park, PA, and G. E. Kane, Lehigh University, Bethlehem, PA)
2. "On the Geometry of End Milled Surfaces" (T. S. Bailon, J. W. Sutherland, and S. S. Kipper, University of Illinois at Urbana-Champaign, Urbana, IL)
3. "Using Surface Roughness as a Wear Criterion for High Speed Steel End Milling" (D. A. Evans, National Bureau of Standards, Gaithersburg, MD)

B. Room B
Co-Chairmen:
R. Austrin, Lehigh University, Bethlehem, PA
B. Elkan, Anka Technical Center, Arco Center, PA
1. "Establishment and Application of Formulas to Predict the Cold-Forging Load in Consideration of the Strain History" (M. Toda and T. Miyay, Nippon Steel Corporation, Sagamihara, Japan)
2. "Thermal Effects in Hammer Forging" (P. Dadda, B. R. Burke, and B. C. Stowe, Wright State University, Dayton, OH)
3. "Plastic Flow Localization and Instability in Metal Processing" (B. F. van Vroch and W. F. Stewart, University of Vermont, Burlington, VT)

C. Room C
Co-Chairmen:
J. Naun, Pennsylvania State University, University Park, PA
E. L. Barner, University of Minnesota, Minneapolis, MN
2. "Hierarchical Non-Hierarchical Manufacturing Cell Control with Dynamic Part-Oriented Scheduling" (R. G. Duffie, University of Wisconsin, Madison, WI)
3. "Tool Management Tasks in Flexible Manufacturing Systems (FMS)" (F. G. Ranky, University of Michigan, Ann Arbor, MI)

Lunch
12:00 noon - 1:30 p.m.

SESSION 2
A. Room A
Co-Chairmen:
N. Abood, University of Pennsylvania, Philadelphia, PA
S. Ramalingam, University of Minnesota, Minneapolis, MN
1. "Design and Calibration of Dynamometer for CNC Lathes" (D. Hoffman and B. K. Pedersen, Technical University of Denmark, Lyngby, Denmark)
2. "General Analysis of Dynamometers for Metal Cutting" (D. F. Peetersen and J. Hoffmann, Technical University of Denmark, Lyngby, Denmark)
Established in 1915, the Minneapolis Institute of Arts is rated as one of the top 10 art museums in the United States. Its collection consists of over 70,000 pieces of art, covering a broad spectrum which includes painting, sculpture, textiles, ceramics and decorative art. The Museum receives over half a million visitors a year. Transportation to the Minneapolis Institute of Arts from the Radisson University Hotel will be provided by bus.

THURSDAY, MAY 29
8:00-8:30 a.m. Coffee Lobby, Radisson University Hotel
8:30-10:00 a.m. SESSION 4
A. Room A
Co-Chairman: B.F. Von Turkovich, University of Vermont, Burlington, VT
K. Ueda, Kanazawa University, Kanazawa, Japan
1. "Adaptive Control in Interupted Turning Based on Analytical Prediction of Brittle Failure of Cutting Edge," K. Ueda, A. Sitte, and T. Suga, Kanazawa University, Kanazawa, Japan
2. "On a New Adaptive Control Strategy in Machining Based on Real-Time Street and Temperature Data," A. Bagchi, Ohio State University, Columbus, OH
3. "Optimization of Multi-Pass Turning," N. Adler, University of Paterno, Pescia, Italy
B. Room B
Co-Chairman: J. Male, Westinghouse Electric Company, Pittsburg, PA
J. Jeevans, Queen's University, Kingston, Canada
1. "Analysis of Tool/Workpiece Interface Stresses in Metal Forming," J. Ray, Technical University of Denmark, Lyngby, Denmark
2. "Friction Along the Fixed Mandrel in the Hydrostatic Extrusion/Drawning of Tubes," J. Zappe, Imperial College of Science and Technology and M.J. P. Morquio, University of London, London, United Kingdom
C. Room C
Co-Chairman: S.M. Fandil, Michigan Technological University, Houghton, MI
W. Kowalski, Metals Research Associates, Cleveland, OH
2. "Classification and Coding System for the Foundry Industry," R. L. Liotta and J. Rubinowitz, Pennsylvania State University, University Park, PA
D. Room D
Co-Chairman: E. Ei, Technical University of Braunschweig, Germany
M. Shaw, Arizona State University, Tempe, AZ
3. "Feasibility of Coated Abrasives as a Replacement for Simple-Point Cutting Tools in High-Speed Metal Cutting," K.L. Whang and N.P. Goh, Massachusetts Institute of Technology, Cambridge, MA 10:00-10:30 a.m.
Break Lobby, Radisson University Hotel
10:30 a.m. - 12:00 Noon SESSION 5
E. Room A
Co-Chairman: H. Rose, Owens University, Kingston, Ontario, Canada
G. M. Rustland, University of California, Berkeley, CA
3. "Optimization of Multiple Operations in Convex and CNC EDM," I.S. Kaur, University of Nebraska, Lincoln, NE
F. Room B
Co-Chairman: T. Kato, Ohio State University, Columbus, OH
M. Kashi, University of Tokyo, Tokyo, Japan
1. "Upper-Bound Solutions for Several Metal Forming Processes," S. Avisor, J.C. Chiar, Lehrich University, Battlefileld, PA, and M. Kim, Korean National University, Pusan, South Korea


A. Room C
Co-Chairman: M. O. O. C. University of Minnesota, Minneapolis, MN.

B. Room D
Co-Chairman: H. S. C. University of Michigan, Ann Arbor, MI.

C. Room E
Co-Chairman: R. A. H. Michigan State University, East Lansing, MI.

D. Room F
Co-Chairman: R. G. F. University of Illinois at Urbana-Champaign, Urbana, IL.

E. Room G
Co-Chairman: H. B. M. University of Minnesota, Minneapolis, MN.

F. Room H
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

G. Room I
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

H. Room J
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

I. Room K
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

J. Room L
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

K. Room M
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

L. Room N
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

M. Room O
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

N. Room P
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

O. Room Q
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

P. Room R
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

Q. Room S
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

R. Room T
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

S. Room U
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

T. Room V
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

U. Room W
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

V. Room X
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

W. Room Y
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

X. Room Z
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

Y. Room A
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.

Z. Room B
Co-Chairman: R. G. E. University of Michigan, Ann Arbor, MI.
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<tr>
<th>Position</th>
<th>Name</th>
<th>Institution/Company</th>
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<tr>
<td>President</td>
<td>P.H. Ham</td>
<td>Pennsylvania State University</td>
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<tr>
<td>Vice President</td>
<td>S. Ramalingam</td>
<td>University of Michigan</td>
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<td>Secretary</td>
<td>C. A. Benda</td>
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<td>Executive Director</td>
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<td>Scientific Committee</td>
<td>T. Alton, Chair</td>
<td>Ohio State University</td>
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<td>S. Wu</td>
<td>University of Wisconsin</td>
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**NAMRC XIV ORGANIZING COMMITTEE**

- University of Minnesota, Minneapolis: M. Donath, A.E. Erdmann, K. Stelson
- University of California, Berkeley: B. Klimecki, D. Riley, J. Vollum
REGISTRATION FORM
NAMRC XIV • MAY 28-30, 1986

Name ____________________________
Last First Middle

Company/University Name ____________________________

Office Address ____________________________

City/State/Zip ____________________________

Telephone ____________________________

Enclosed is payment for NAMRC XIV as follows:
___ Registrations in NAMRC XIV @$225 U.S. per person $ ___
___ Additional banquet tickets @$25 U.S. per person $ ___
___ Enclosed is a letter of authorization to bill my company/university 

___ I am interested in the companion tours

Mail to: Registrar, Department of Professional Development, University of Minnesota, 315 Pillsbury Drive, SE, Minneapolis, MN 55455

For Additional Information Contact:
Theresa Dury • Department of Professional Development • University of Minnesota • 315 Pillsbury Drive, SE • Minneapolis, MN 55455 • (612) 373-3189 (Before April 26, 1986) • (612) 626-8686 (after April 26, 1986)