The North American Manufacturing Research Institution of the Society of Manufacturing Engineers Announces Its...

NINETEENTH NORTH AMERICAN MANUFACTURING RESEARCH CONFERENCE

NAMRC XIX
MAY 22-24, 1991

The University of Missouri—Rolla
Rolla, Missouri USA

North American Manufacturing Research Institution of the Society of Manufacturing Engineers
1990-91 NAMRI/SME
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C.H. Dagli
REGISTRATION AND GENERAL INFORMATION

NAMRC XIX CONFERENCE PROSPECTUS
The Nineteenth North American Manufacturing Research Conference (NAMRC XIX), to be held May 22-24, 1991, is designed to provide a forum for the timely presentation and critical discussion of the results of basic and applied research in material forming, material removal, and manufacturing systems/automation. All papers presented at the conference are contained in the bound volume titled "Transactions of the North American Manufacturing Research Institution of SME—1991." These papers have been accepted based upon a review of full length submissions and highlight manufacturing research efforts from universities, centers, and companies from around the world.

The conference will feature three parallel sessions in material forming, material removal, and manufacturing systems. The sessions will include formal presentations of the papers and a discussion period following each presentation. In addition, there will be a general keynote address, several "open but structured" interaction sessions, and two sessions focused on various aspects of university/industry interaction.

CONFERENCE LOCATION AND TRANSPORTATION (See Maps)
The conference will be held at the University of Missouri-Rolla, which is located in Rolla, Missouri, a small university town located 105 miles southwest of St. Louis and 110 miles northeast of Springfield, Missouri. Lying in the northern foothills of the Ozark Mountains, Rolla is in a beautifully scenic area and is easily accessible. Interstate-44 runs from St. Louis through Rolla to the southwest (old U.S. 66). U.S. Highway 63 passes through Rolla in a north-south direction, and Missouri Highway 72 terminates in Rolla from the southeast.

The easiest way to reach Rolla from distant points is through Lambert-St. Louis Airport. Bus service (Greyhound) from the Airport to Rolla is direct, with buses departing the airport at 8:10 a.m., 2:30 p.m., 7:05 p.m., 8:20 p.m., and 11:20 p.m. To supplement this schedule, a University bus or van will depart from the lower level of the airport (by the baggage claim area) at 4:30 p.m. on Tuesday afternoon, May 21, 1991. Please note your desire to use this service on your registration form.

Those wishing to drive from the airport to Rolla will find the 110 miles to be all Interstate highway. Upon leaving the airport, take I-70 west approximately 3 miles to the junction of I-270. Take I-270 south, approximately 15 miles to the junction of I-44 (exit labeled Tulsa). Exit onto I-44 west and proceed to Rolla.
LODGING

Blocks of rooms have been reserved at nine of Rolla’s motels for the nights of May 21-23. Conference attendees should make their own reservations and indicate to the hotel that they will be a participant in the NAMRC Conference to obtain reduced rates.

<table>
<thead>
<tr>
<th>MOTEL</th>
<th>RATES</th>
<th>RESERVATION DEADLINE</th>
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</thead>
<tbody>
<tr>
<td>Bestway Inn</td>
<td>S: $30-$84</td>
<td>May 1, 1991</td>
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<tr>
<td>1631 Martin Spring Dr.</td>
<td>D: $27-$30</td>
<td>May 1, 1991</td>
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<tr>
<td>(314) 341-2158</td>
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<tr>
<td>Budget Deluxe</td>
<td>S: $22</td>
<td>May 1, 1991</td>
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<tr>
<td>1908 N. Bishop</td>
<td>D: $24.95</td>
<td>May 1, 1991</td>
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<tr>
<td>(314) 364-4488</td>
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<tr>
<td>Days' Stop-Rolla</td>
<td>S: $90.95</td>
<td>May 1, 1991</td>
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<tr>
<td>I-44 Business Route</td>
<td>D: $94.95</td>
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<tr>
<td>(314) 341-3700</td>
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<tr>
<td>Drury Inn</td>
<td>S: $34-$44</td>
<td>May 18, 1991</td>
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<tr>
<td>I-44 &amp; U.S. 69</td>
<td>D: $44-$48</td>
<td>May 18, 1991</td>
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<tr>
<td>(314) 364-6000</td>
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<tr>
<td>E route Lodge</td>
<td>S: $27.95</td>
<td>May 1, 1991</td>
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<tr>
<td>1417 Martin Spring Dr.</td>
<td>D: $34.95</td>
<td>May 1, 1991</td>
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<tr>
<td>(314) 341-3330</td>
<td></td>
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<tr>
<td>Howard Johnson's</td>
<td>S: $34</td>
<td>May 1, 1991</td>
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<tr>
<td>I-44 Business Route</td>
<td>D: $46</td>
<td>May 1, 1991</td>
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<tr>
<td>(314) 364-7111</td>
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<tr>
<td>Thrifty Inn</td>
<td>S: $20-$25</td>
<td>May 18, 1991</td>
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<tr>
<td>I-44 &amp; U.S. 63</td>
<td>D: $25-$37</td>
<td>May 18, 1991</td>
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<tr>
<td>(314) 364-1333</td>
<td></td>
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<tr>
<td>Western Inn</td>
<td>S: $26</td>
<td>May 1, 1991</td>
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<tr>
<td>1605 Martin Spring Dr.</td>
<td>D: $32</td>
<td>May 1, 1991</td>
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<tr>
<td>(314) 341-3050</td>
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<tr>
<td>Zeno's Motel</td>
<td>S: $29</td>
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<tr>
<td>Martin Spring Drive</td>
<td>D: $38</td>
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</tr>
<tr>
<td>(314) 364-1301</td>
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CAMPUS HOUSING

Rooms are also available in the University’s Thomas Jefferson Residence Hall. Located just three short blocks from campus, this two-story high rise structure offers dormitory accommodations, large lounge areas, conference rooms, game rooms, an attached outdoor pool and deck area, a large patio, air conditioning, and ample parking. Rates for the NAMRC Conference will be $14.75 a day for single occupancy and $9.90 per person for double occupancy. Towels, washcloths, and linens will be provided for an additional $7.70 per person. Washrooms are limited to common facilities on each corridor.

SHUTTLE BUS SERVICE

University transportation will be provided between the Thomas Jefferson Residence, the motels listed on the opposite page, and the University Center each morning and at the conclusion of the afternoon sessions each day. In addition, transportation will be provided for the Ozark Bar-B-Q on Wednesday evening.

PARKING

Free parking will be available at all conference motels and in the lots adjacent to the Thomas Jefferson Residence. In addition, visitor parking is available in Lots 21 and 17, which are adjacent to the University Center. No special permits are needed.

TRANSACTIONS

All registered NAMRC participants will receive one hardbound copy of the "Transactions of the North American Manufacturing Research Institution of SME—1991" at the time of registration. Additional copies may be purchased at the conference or by contacting Walter Ries, Coordinator of Continuing Education, 119 ME Annex, University of Missouri-Rolla, Rolla, MO 65401, Phone (314) 341-4152 or 10900 752-5057. The cost per copy is $65.

OZARK BAR-B-Q

In lieu of the normal conference banquet, the University of Missouri-Rolla will offer an enhanced version of the Ozark Bar-B-Q that was the highlight of the 1980 NAMRC VIII Conference. In addition to all-you-can-eat ribs, hickory smoked meat, baked beans, and other trimmings, this year’s feast will also include roast pig. Dress will definitely be informal, so bring your jeans, work shirt, and stompin’ boots and be prepared to enjoy some bluegrass music and genuine Ozark square dancing.

SPOUSE PROGRAM

An informal spouses program will be conducted under the direction of Barb Kolser. Plans call for local activities on Wednesday, focusing on the history of the campus and surrounding area, and will include a lunch at a local historic site. The evening will conclude with the Ozark Bar-B-Q (additional tickets required).

On Thursday, the group will travel to St. Charles, Missouri, where they will tour Missouri’s first capital, the numerous shops along the restored waterfront, and the antique-shoppers’ paradise in old Frenchtown.

A Friday morning tea/breakfast will be offered for those wishing to attend. A fee of $40 will cover transportation, admissions, and the Friday brunch. Other meals are not included. To facilitate planning and scheduling, registration for the Spouses’ Program should be made in ad-
vance. Please complete the appropriate section on the registration card, including the name of the participant.

For those individuals who might desire babysitting/child care, a listing of possible providers will be available upon request. Individual arrangements and compensation will be required.

CONFERENCE FEES
Registration fees for NAMRC XIX are $265 (U.S. currency) for advance registration and $275 (U.S. currency) for on-site registration. This fee includes admission to all sessions, a bound copy of the 1991 Transactions of NAMRI/SME, refreshments, two luncheons, and the Ozark-Bar-B-Q. There will be no one-day registration fees or reduced fees for authors or session chairmen.

Students and retirees will be admitted to the conference for $65. This fee is a special rate to encourage attendance and includes entrance to all sessions, refreshments, and meals. Bound copies of the conference Transactions can be purchased at the member price of $65.

Extra lunch tickets for May 24 and 25 will be available for $10 each. Additional tickets for the Ozark Bar-B-Q on May 22 are $20 each. Please indicate your desire for additional meals tickets on the registration form.

Full refunds will be extended for cancellations received prior to May 8, 1991. After this date, no refunds will be extended.

TO REGISTER
Complete and return the registration form with the proper fee. Checks, money orders, or purchase orders should be made payable to the University of Missouri-Rolla. All payments must be in U.S. currency. Send registration and payment to: Walter Ries, Coordinator of Continuing Education, 119 ME Annex, University of Missouri-Rolla, Rolla, MO 65401. Registration material can be sent via FAX to (314) 341-4992.

FOR FURTHER INFORMATION
For additional information regarding papers, sessions, meetings, etc., call Dr. Ronald A. Kohser at (314) 341-4734. For questions regarding registration, housing, and transportation, call Walter Ries, Coordinator of Continuing Education at (314) 341-4132 or 1800-752-5957. For additional information regarding the Spouses' Program, call Barb Kohser at (314) 341-3893 after 5:00 p.m. CST. During the conference, incoming messages for attendees will be accepted at (314) 341-4924 and will be posted on a bulletin board near the meeting rooms.

NAMRC XIX
Technical Program and Sessions

TUESDAY, MAY 21

5:00 p.m.-7:00 p.m.
REGISTRATION AND RECEPTION Miner Lounge, University Center East

7:00 p.m.
NAMRI/SME Board of Directors Dinner Silver and Gold Room, University Center East

8:00 p.m.
NAMRI/SME Board of Directors Meeting Silver and Gold Room, University Center East

WEDNESDAY, MAY 22

7:30 a.m.-9:00 a.m.
REGISTRATION Miner Lounge, University Center East

8:30 a.m.-9:00 a.m.
OPENING SESSION Mechanical Engineering Auditorium

OPENING REMARKS
R.A. Kohser, Chairman, NAMRC XIX Organizing Committee

WELCOMING REMARKS
Martin Jischke, Chancellor, University of Missouri-Rolla
Robert L. Davis, Dean of Engineering, University of Missouri-Rolla

INTRODUCTORY REMARKS
D.A. Durenfield, NAMRI/SME President, University of California-Berkeley

9:00 a.m.-10:00 a.m.
KEYNOTE PRESENTATIONS
"National Strategy for Industrial Base Modernization."
Mr. Leo Reddy, President, National Coalition for Advanced Manufacturing (NACFAM), Washington, D.C.

"The Small Business Perspective—What it Takes to be Competitive."
Mr. Michael Wicklund, President, Missouri Forge, Doniphan, Missouri
SESSION 1

SESSION F-1 Mark Twain Room
Co-Chairmen: J. Story, Alcoa Laboratories
J. Gunasekera, Ohio University

F-1-1: "Rigid Viscoelastic Tapered Compression with Microhardness as an Internal State Variable," Y.C. Shiau, V.P. Ravi and C.K. Fong, Oklahoma State University, Stillwater, OK.


SESSION M-4 Centennial Hall East
Co-Chairmen: W. Zdechlik, Center for Manufacturing and Machine Tool Technology, IAMBS
K. Synco, Ohio State University


M-4-3: "An Investigation of Three-Dimensional Chip Flow in Machining Steels with Groove Chip Forming Tool Inserts," I.S. Jawahir, University of Kentucky, Lexington, KY.

M-4-4: "A Study on Micro Orthogonal Machining of Single Crystal Copper," T. Moriwaki, K. Manabe and K. Iwata, Kobe University, Kobe, Japan.

SESSION S-1 Centennial Hall West
Co-Chairmen: A. Okada, Pennsylvania State University
A. Boysen, Washington State University


S-1-2: "Concurrent Process Planning for Machining and Inspection of Sculptured Surfaces," H-T Yau and C-H Menn, Ohio State University, Columbus, OH.

S-1-3: "Improving Countouring System Accuracy by Two-Stage Actuation," O. Masory and J. Wang, Florida Atlantic University, Boca Raton, FL.

12:00 Noon-1:30 p.m.
LUNCHEON Rayl Cafeteria, University Quadrangle Dormitories
1:30 p.m.-3:00 p.m.

SESSION 2

SESSION F-2 Mark Twain Room
Panel Discussion: "University-Industry Interaction: The Business Perspective"
Chairman: H.D. Kirsch, University of Missouri-Rolla
Panel Members:
J. Jablonski, American Machinist
J. Dowd, Dowd Associates
A. Sabatof, Eaton Corporation
M. Wicklund, Missouri Forge & Forging Industry Association

SESSION M-2 Centennial Hall East
Co-Chairmen: W. DeVries, Rensselaer Polytechnic University
A. Boysen, Washington State University


M-2-2: "Control of Radial Runout of Multi-Tool Face Milling," T.C. Tsao and K-C. Peng, University of Illinois at Urbana-Champaign, Urbana, IL.

M-2-3: "High Speed Machining of α-β Titanium with Ultra-High Pressure Lubrication/cooling Through the Insert," R.R. Lindese, University of Minnesota, Duluth, Minnesota, P.C. Schoenig Jr., A.K. Khan and J. Haddad, Cleveland State University, Cleveland, OH.

SESSION S-2 Centennial Hall West
Co-Chairmen: J. Gereen, University of Colorado-Denver
C. Dagli, University of Missouri-Rolla


S-2-2: "Data Base Implementation to Extract Geometric Features from CAD System's Part Data," L.M. Rosario, University of Puerto Rico at Mayaguez, Mayaguez, Puerto Rico, and W.A. Knight, University of Rhode Island, Kingston, Rhode Island.
THURSDAY, MAY 23

8:30 a.m.-10:00 a.m.
SESSION 4
SESSION F-4 Mark Twain Room
Co-Chairmen: S-I. Oh, Battelle Columbus Laboratories
K. Weinmann, Michigan Technological University
F-4-1: "Analytical Modeling of the Pack Rolling Process," A.F. Ali,
A. Rathinavel and J.S. Gunasekera, Ohio University, Athens, OH, and
W. Kerr, Wright Patterson Air Force Base, Dayton, OH.
F-4-2: "Three-Dimensional Coupled Simulation of Strip and Shape
Rolling Processes," J. Yanagimoto and M. Kachi, University of
Tokyo, Tokyo, Japan.
F-4-3: "Non-Steady State Simulation of Three-Dimensional Deforma-
tion around Front and Rear Ends in Shape Rolling by the Finite
Element Method," K. Mori and K. Osakada, Osaka University, Osaka,
Japan.

SESSION M-4 Centennial Hall East
Co-Chairmen: K. DeVer, University of Illinois at Urbana-Champaign
D. Durham, University of Vermont
M-4-1: "Vibrations of a Filamentary Brush in Contact with a Solid
Roll," J.H. Heo and K.F. Ehmann, Northwestern University,
Evanston, IL.
M-4-2: "Diagnosis of Faults with Thin-Film Sensors in a Multiple-
Spindle Drilling Head," C. Niedos and M. Schwedler, Technische
Universitat Hamburg-Harburg, Hamburg, Germany.
M-4-3: "Machining Condition Monitoring by an X-Ray Diffraction
Method," Y.C. Shin and S.J. Oh, Purdue University, West Lafayette,
IN, and C.O. Raad, The Pennsylvania State University, University
Park, PA.

SESSION S-4 Centennial Hall West
Co-Chairmen: G. Chrysoulakis, Massachusetts Institute of
Technology
D. Dornfeld, University of California-Berkeley
S-4-1: "Optical Gaging of Very Short-Term Surface Waviness," P.P.
Lin, F. Parvin and F.C. Schoenig, Cleveland State University,
Cleveland, OH.
S-4-2: "Tolerances and Function in Concurrent Product and Process
Design," R.G. Wilhelm and S.Y.C. Lu, University of Illinois at Urbana-
Champaign, Urbana, IL.
SESSION F-5 Mark Twain Room
"Open" Session on Metal Forming Research
Session Moderator: R. Kohser, University of Missouri-Rolla
This session is dedicated to the presentation of recent breakthroughs, unpublished industrial research activity, and work in-progress, as well as requests for suggestions or assistance and the dispersal of information relating to new research programs and opportunities. Presentations will be limited to 10 minutes each. Those wishing to make a presentation should contact Dr. Ronald Kohser at (314) 341-4734 to make their request. NOTE: This is NOT a forum for the presentation of unaccepted papers!

SESSION M-5 Centennial Hall East
Co-Chairmen: K. Ehmann, Northwestern University
K. Rajurkar, University of Nebraska
M-5-1: "Modeling and Estimation of Quasistatic Machine-Tool Errors," V.S.B. Kirdena and P.M. Ferreira, University of Illinois at Urbana-Champaign, Urbana, IL

SESSION S-3 Centennial Hall West
"Open" Session on Manufacturing Systems Research
Session Moderator: L.A. Kendall, University of Minnesota-Duluth
This session is dedicated to the presentation of recent breakthroughs, unpublished industrial research activity, and work in-progress, as well as requests for suggestions or assistance and the dispersal of information relating to new research programs and opportunities. Presentations will be limited to 10 minutes each. Those wishing to make a presentation should contact Dr. Ronald Kohser at (314) 341-4734 to make their request. NOTE: This is NOT a forum for the presentation of unaccepted papers!

12:00 Noon-1:30 p.m.
NAMU/USME LUNCHEON Rayl Cafeteria, University Quadrangle: Dormitories
1:30 p.m.-3:00 p.m.
SESSION 6
SESSION F-6 Mark Twain Room
Co-Chairmen: T. Altan, Ohio State University
A. Sabroff, Eaton Corporation
F-6-2: "A Frame-Based Representation for the Design of Sheet Metal Parts," J. Wang and W.R.D. Wilson, Northwestern University, Evanston, IL.
F-6-3: "Backing Stiffness of Car Roofs After Forming," J.C. Gerdeen, J.B. Wetterdah and M. Heuser, University of Colorado at Denver, Denver, CO.

SESSION M-6 Centennial Hall East
Co-Chairmen: V. Venkatesh, Tennessee Technological University
D. Blaser, General Motors Research Laboratories
M-6-4: "Tribological Aspects of Interrupted Cutting with Ceramic Tool Materials," H.K. Tonshoff and B. Denker, Institute for Production Engineering, Hannover, Germany.

SESSION S-6 Centennial Hall West
Co-Chairmen: W. Knight, University of Rhode Island
G. Wiens, Auburn University
S-6-3: "On-Line Monitoring of Tool Breakage with Unsupervised Neural Networks," I.N. Tassell, Florida International University, Miami, FL, and C. McLaughlin, Tufts University, Medford, Massachusetts.


3:00 p.m.-3:30 p.m.

COFFEE BREAK Miner Lounge, University Center East

3:30 p.m.-5:00 p.m.

INDUSTRY TOUR
Tour of manufacturing laboratories at the University of Missouri-Rolla
5:00 p.m.-6:00 p.m.

WINE AND CHEESE RECEPTION Miner Lounge, University Center East

6:00 p.m.

NAMRI/SME MEMBERSHIP MEETING Centennial Hall East

7:00 p.m.

ARME PRODUCTION ENGINEERING DIVISION MEETING
Mark Twain Room

Please note that this meeting will start immediately following the NAMRI/SME Membership Meeting.

DINNER ON YOUR OWN
A listing of local restaurants and their fare will be provided.

FRIDAY, MAY 24

8:30 a.m.-10:00 a.m.

SESSION 7

SESSION F-7 Mark Twain Room
Co-Chairmen: C. VanTyne, Colorado School of Mines
G. Lohot, Timkin Company

F-7-1: "Admissible Velocity Field for the Upsetting of Cylindrical Workpieces," Z.H. Cai and G.E.O. Widders, University of Illinois at Chicago, Chicago, IL

F-7-2: "Image Analysis Applications in Metal Forming Research," S.A. Majlessi and K.J. Weinmann, Michigan Technological University, Houghton, MI.


SESSION M-7 Centennial Hall East
Co-Chairmen: R. Komxorduri, Oklahoma State University
S. Kapoor, University of Illinois at Urbana-Champaign


SESSION S-7 Centennial Hall West
Co-Chairmen: J. Nazemetz, Oklahoma State University
S. Lu, University of Illinois at Urbana-Champaign


S-7-2: "Dynamic Analysis of an Air Pallet Mobile Robot," G.J. Wiens and E.F. Liu, Auburn University, Auburn, AL.

S-7-3: "Performance Evaluation of a Routing Algorithm for AGV Systems," J. Huang and U.S. Palakar, University of Illinois at Urbana-Champaign, Urbana, IL.

10:00 a.m.-10:30 a.m.

COFFEE BREAK Miner Lounge, University Center East

ADJOURNMENT

OPTIONAL PLANT TOUR
University transportation will leave Rolls at 11:00 a.m. for the Chrysler Assembly Plant #2 in Fenton, Missouri. This plant assembles the extended-wheel-base minivans (Dodge Caravan/Plymouth Voyager) and offers state-of-the-art manufacturing systems technology. It is located approximately 75 miles northeast of Rolls, along Interstate 44, conveniently along the way to the Lambert-St. Louis airport. With a stop for lunch along the way, the tours will begin between 1:00 and 1:30 p.m. and will conclude in time to assure arrival at the airport by 4:00 p.m. Attendees can use either University or personal transportation, but should note their interest in the tour on the registration form so that adequate plans can be made.
ADVANCE REGISTRATION FORM

NAMRC XIX
May 22-24, 1991
University of Missouri-Rolla

Please print or type:

Last Name: ___________________________ First Name: ___________________________ Middle Initial: ___________________________

Company or Organization: ___________________________

Business Address (number and street or box number): ___________________________

City: ___________________________ State: ___________________________ Zip Code: ___________________________

Business Telephone ( ) ___________________________

Indicate Your Fee:

- Advance Registration Fee $365 (includes luncheons, Bar-B-Q, and Transactions)
- Advance Student/Retiree Registration Fee $65 (includes luncheons and Bar-B-Q; does not include Transactions)
- Extra Copy of Transactions $65
- Extra Lunch Ticket (Spouse or Guest) May 22 Fee $10
- Extra Lunch Ticket (Spouse or Guest) May 23 Fee $10
- Extra Out of Bar-B-Q Ticket (Spouse or Guest) Fee $20
- Reserve _______ seat(s) for me on University Transportation to Rolla—leaves airport at 4:30 p.m., May 21 Fee $15
- Spouse’s Program Fee $40
- Spouse/Guest Name: ___________________________

Reservations:

☐ Reserve a room for me in the University Dormitory

☐ Single

☐ Double

Payment will be made upon registration at the dormitory.

NOTE: Those wishing to utilize the local motels should make reservations directly.

☐ I would like to attend the Chrysler Assembly Plant Tour on May 24th

☐ Vegetarian Meals requested

Payment:

Amount of Total Payment: ___________________________

Payment will be made by:

☐ Enclosed check (U.S. currency) payable to the University of Missouri-Rolla

☐ Purchase Order Number: ___________________________

☐ Credit Card: ☐ VISA ☐ MasterCard

Cardholder’s Name: ___________________________

Cardholder’s Signature: ___________________________

Expiration Date: ___________________________

Mail Registration to: Walter Fries, Coordinator of Continuing Education, 119 ME Annex, University of Missouri-Rolla, Rolla, MO 65401, or FAX to (314) 341-4952.