# Table of Contents

## SESSION 1: QUALITY MANAGEMENT IN AN ENGINEERING SETTING

**Chairman:** Gerard H. Gaynor, 3M Corporation, St. Paul, Minnesota  
**Discussant:** Dr. C. Harhalakis, University of Maryland, College Park, Maryland

- "Engineering Management Quality Improvement Program," J. W. Brothers, Bechtel Power Corporation, Gaithersburg, Maryland

## SESSION 2: PERSONAL COMPUTERS IN TECHNICAL MANAGEMENT: WHAT MANAGERS SHOULD KNOW

**Chairman:** Thomas H. Grimm, Ohio Bell Telephone Co., Shaker Heights, Ohio  
**Discussant:** Thomas C. LaCroix, Bechtel Power Corporation, Gaithersburg, Maryland

- "A Flexible Generator for Proposal Budgets Using a Personal Computer Spreadsheet," Dr. Ronald L. Seaman, Louisiana Tech. University, Ruston, Louisiana
- "Trends and Implications of Computer Use in Industrial Research and Development," Dr. Alan L. Porter and Dr. Frederick A. Rossini, Georgia Institute of Technology, Atlanta, Georgia

## SESSION 3: MEASURING THE QUALITY OF DESIGN

**Chairman:** Dr. Fred I. Denny, Edison Electric Institute, Washington, D.C.  
**Discussant:** James Toney, Bureau of Labor Statistics, Washington, D.C.

- "Where Should Reliability & Maintainability Engineering be in the Organizational Structure?" Don DeCrescenzo and Henry E. Zebick, General Dynamics Corporation, San Diego, California

## SESSION 4: INFORMATION TECHNOLOGIES AND PROJECT MANAGEMENT

**Chairman:** Dr. William C. Dean, Teledyne Geotech., Alexandria, Virginia  
**Discussant:** Lt. Colonel Robert J. Might, National Defense University, Washington, D.C.  
**Discussant:** Robert Chartrand, Library of Congress, Washington, D.C.

"An Expert System for Project Termination," Wonboo Lee and Dr. Samuel J. Hantel, Jr., University of Cincinnati, Cincinnati, Ohio ........................................ 52

"Computer Technologies...Key To Successful Management of a Large Construction Project," D. Margeson and E. Perko, Bechtel Power Corporation, Gaithersburg, Maryland *

"Understanding Scenarios," Dr. D. K. Pace, The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland ........................................ 59

SESSION 5: ENGINEERING MANAGEMENT PROGRAMS IN ACTION ........................................ 65
Chairman: Dr. Richard A. Johnson, System Research Laboratories, Inc., Dayton, Ohio
Discussant: James F. Strother, Consultant, Alexandria, Virginia


"Engineering Management in Action: Infrastructure and Fiscal Planning for Communities Impacted by Rapid Growth," William B. Moore, P.E., Logistics Management Institute, Bethesda, Maryland ........................................ 66

"Energy Accounting and Control Systems in Industry: A Cost-Advantage Analysis," J. B. Lesourd and A. Consomni, Universite de Droit, Marseille, France ........................................ 76

SESSION 6: COMPUTER TECHNOLOGY APPLICATIONS IN CONSTRUCTION AND MANUFACTURING MANAGEMENT ........................................ 79
Chairman: Wessley Merryman, Nissen Corporation, Cedar Rapids, Iowa
Discussant: Dr. Peter Malpass, Contel, Fairfax, Virginia
Discussant: Timothy Killen, Bechtel Power Corporation, Gaithersburg, Maryland


"Quantitative Building Site Management," Dr. Walter E. Rodriguez-Ramos, P.E., Georgia Institute of Technology, Atlanta, Georgia ........................................ 80

"Justification of Microcomputer-Based CADD in a Small to Medium Size Manufacturing Industry," N. Odeh and M. Najm, The Wichita State University, Wichita, Kansas; and Dr. Y. Omurtag, P.E., University of Missouri-Rolla, Rolla, Missouri ........................................ 82


SESSION 7: POLITICS AND PEOPLE IN ENGINEERING MANAGEMENT ........................................ 93
Chairman: Vivian A. Carr, Engineering Management Society, Long Branch, New Jersey
Discussant: E. Ross Curtis, P.E., STS Consultants Limited, Fairfax, Virginia

"C.A.S.H.: Engineering's Route to Top Management," Dr. Warren C. Hauck, Bowling Green State University, Bowling Green, Ohio ........................................ 94


"Engineering Management: Planning, Organizing and Controlling vs Product, Process and Organizational Life Cycles," Dr. Albert E. J. Bachmann, Florida Institute of Technology, Melbourne, Florida ........................................ 105

SESSION 8: NEW TRENDS IN EDUCATION AND TRAINING OF ENGINEERS AND TECHNICAL MANAGERS ........................................ 111
Chairman: Dr. Dundar F. Kocaoglu, University of Pittsburgh, Pittsburgh, Pennsylvania
Discussant: Dr. James Jacobs, Industrial Technology Institute, Ann Arbor, Michigan


*Paper not yet received at press time.
"A National Probability Survey on Education and Training for CAD/CAM," Dr. Ann Majchrzak, Purdue University, West Lafayette, Indiana ........................................ 115


SESSION 9: PRODUCTIVITY, INTERFACING, AND THE QUALITY OF WORKING LIFE ........................................ 127
Chairman: Michael F. Wolff, Industrial Research Institute, New York, New York
Discussant: Dr. David Moran, David Taylor Naval R&D Center, Washington, D.C.
Discussant: Edward D. Crossett, McDonnell Douglas Corporation, Long Beach, California


"Barriers to Improving Engineering Productivity in the Workplace," Mark S. Donahue, P.E., Bechtel Power Corporation, Gaithersburg, Maryland *


SESSION 10: HOW TO MANAGE CORPORATE GROWTH THROUGH TECHNOLOGY-BASED STRATEGIES ...................... 135
Chairman: Dr. Norman Waks, Mitre Corporation, Bedford, Massachusetts
Discussant: Dr. Larry Shirland, The University of Vermont, Burlington, Vermont
Discussant: John A. Demastra, Florida Power and Light Company, Juno Beach, Florida

"Strategic Use of Technology," Dr. Ted G. Eschenbach and Dr. George A. Geistauts, University of Alaska, Anchorage, Alaska ........................................ 136

"Growing Through Acquisition in Consulting Engineering," Dr. Joseph F. Singer, Burns & McDonnell Engineering Company, Kansas City, Missouri ........................................ 146


"Matching Corporate and Technology Strategies—A Study of Some Firms in the Chemical Industry," Dr. Falguni Sen and Dr. Alok Chakrabarti, Drexel University, Philadelphia, Pennsylvania ........................................ 163

SESSION 11: ENHANCING TEAM BUILDING SKILLS IN ENGINEERING MANAGERS ........................................ 173
Chairman: Palo A. Pfeirce, Hanscom Air Force Base, Bedford, Massachusetts
Discussant: Dr. Ralph Katz, Northeastern University, Boston, Massachusetts

"Management Team Building: Yes But!," Ernest F. Tolle, IBM Corporation, Lexington, Kentucky 174

"The Engineer Manager as a Team Builder," Dr. David R. Lee, P.E., The University of Dayton, Dayton, Ohio ........................................ 181

"Team Communication in Complex Projects," Rick Thomas, AMS Engineering Group, Atlanta, Georgia, and Robert Drury, Systems Management Consultant, Atlanta, Georgia ........................................ 187

SESSION 12: MANAGERIAL SKILL DEVELOPMENT ........................................ 199
Chairman: Dr. Nanette Levinson, The American University, Washington, D.C.
Discussant: Dr. Merl Baker, University of Tennessee, Chattanooga, Tennessee

"Skills for Effective Technology Management," B. K. Sarchet, P.E., University of Missouri-Rolla, Rolla, Missouri ........................................ 200

"Professional Engineers' need for Managerial Skills and Expertise," Olav Solem, University of Trondheim, Trondheim, Norway ........................................ 206


*Paper not yet received at press time.
SESSION 13: INTERPERSONAL SKILLS IN ENGINEERING MANAGEMENT

Chairman: George Starken, The Johns Hopkins University Applied Physics Laboratory, Baltimore, Maryland

Discussant: Dr. David L. Austin, M/COM Linkabit, Inc., San Diego, California

"Skill Requirements for Engineering Managers," Dr. Hans J. Thamhain, Worcester Polytechnic Institute, Worcester, Massachusetts


"How Do You Manage Research When the Researchers Don't Work for You?" Dr. Michael J. Salzkind, Air Force Office of Scientific Research, Washington, D.C.

SESSION 14: SUCCESS IN TECHNICAL MANAGEMENT: LESSONS FROM EXPERIENCE

Chairman: Perry Pascarella, Industry Week, Cleveland, Ohio

Discussant: Dr. Howard Sorrows, National Bureau of Standards, Washington, D.C.

"Quality of Work Life and Engineering Productivity," Dr. Dayton D. Wittke, P.E., Omaha Public Power District, Omaha, Nebraska

"Managing Without Power," Dr. Robert J. Parden, Santa Clara University, Santa Clara, California


SESSION 15: TECHNOLOGY TRANSFER: PRACTICES AND PROCEDURE

Chairman and Discussant: Dr. I. R. Cox, The British Embassy, Washington, D.C.

Transferring Technology to Developing Nations," E. L. Ekholm, Business Consultant, Houston, Texas

"Engineering Technology Transfer for the Vandellas II Project," Patrick S. Thompson, Bechtel Power Corporation, Gaithersburg, Maryland

"Packaging for Success: A Practical Approach to Complex International Projects," M. H. Kappaz and H. Causilla, Bechtel Power Corporation, Gaithersburg, Maryland

SESSION 16: PRACTICAL TOOLS FOR TECHNOLOGY MANAGEMENT

Chairman: Paul A. Willis, P.E., Evaluation Research Corporation, Vienna, Virginia

Discussant: Mani Pulimond, Environmental Elements Group, Baltimore, Maryland


SESSION 17: FUTURE DIRECTIONS IN ENGINEERING MANAGEMENT

Chairman: Dr. Michael K. Badawy, Virginia Polytechnic Institute, Falls Church, Virginia

Discussant: Dr. William C. Dean, Teledyne Geotech, Alexandria, Virginia


*Paper not yet received at press time.
SESSION 18: ENGINEERING MANAGEMENT PRACTICES IN AN INTERNATIONAL SETTING .......................... 293
Chairman: John J. Miller, Shady Valley, Tennessee
Discussant: Dr. Daniel Babcock, P.E., University of Missouri-Rolla, Rolla, Missouri

"Engineering Management, an International Approach," R. B. Dwyer and J. G. Harrison, Badger
Engineers, Inc., Cambridge, Massachusetts .......................................................... 294

"Managing the Design of International Computer-Based Information Systems," Dr. Csaba J.
Egyhazy, Virginia Polytechnic Institute, Falls Church, Virginia .......................... 303

SESSION 19: COMPARATIVE APPROACHES TO ENGINEERING MANAGEMENT EDUCATION: AN INTERNATIONAL
PERSPECTIVE .......................... 309
Chairman: Arnold Rothstein, Florida International University, Miami, Florida
Discussant: Dr. William Swart, University of Central Florida, Orlando, Florida

"Engineering Management Education in Australia - Development, Issues and Directions,"
Edmund J. Young, The South Australian Institute of Technology, Australia ............. 310

"Approach to Industrial Engineering Management Education in the PRC," Chingrui Xu, Zhejiang
University, Peoples Republic of China *

"Engineering Management Curricula for Tomorrow," Dr. Y. Omurtag, P.E., University of
Missouri-Rolla, Rolla, Missouri, Dr. Chan Dagli, Wichita State University, Wichita, Kansas,
Dr. Ibrahim Nisanci, Bradley University, Peoria, Illinois, and Dr. Omar Benli, Middle East
Technical University, Ankara, Turkey ................................................................. 316

SESSION 20: INTERNATIONAL ENGINEERING MANAGEMENT IN ACTION: CROSS-CULTURAL EXPERIENCES AND
APPLICATIONS .......................... 321
Chairman: Dr. Parviz Ghandforoush, Virginia Polytechnic Institute, Falls Church, Virginia
Discussant: Dr. Kosta Triantis, Virginia Polytechnic Institute, Falls Church, Virginia

"Developing a Corporate Approach to Design Management," Alan Topalian, Alto Design
Management, London, United Kingdom *

"Simulation Decision Analysis of the Project System with VERT," Gu Chang-yao and
Liang Shu-ping, Beijing Institute of Aeronautics and Aeronautics, Beijing, Peoples Republic
of China *

"Using Ideas of Systems Science for China Aeronautical R&D Planning," Li Dali and Wu Jiezhi,
Chinese Aeronautical Establishment, Beijing, Peoples Republic of China ................ 322

Fisher, Spivak, McClelland & Maier, P. C., Arlington, Virginia .......................... 332

*Paper not yet received at press time.