

TABLE OF CONTENTS

PLENARY SESSION

Tuesday, November 13, 1979

<i>A Survey of the U.S. Magnetic Fusion Program</i> , E.E. Kintner (Department of Energy, USA)	1
<i>Near Term Engineering Challenges in Inertial Confinement Fusion</i> , C. E. Rossi (Department of Energy, USA)	8
<i>Engineering Challenges in the Tokamak Program</i> , D.B. Montgomery (Massachusetts Institute of Technology, USA)	13
<i>An Overview of International Fusion Technology Programs</i> , F.E. Coffman, J.E. Baublitz, D.S. Beard, M.M. Cohen, E.N.C. Dalder, C.R. Finfgeld, G.M. Haas, C.R. Head, M.R. Murphy, G.R. Nardella, R.N. Ng, T.C. Reuther, H.S. Staten, K.M. Zwilsky (Department of Energy, USA)	18

SESSION 1. MAGNET DESIGN—STRUCTURAL AND ANALYTICAL

Tuesday, November 13, 1979

Chairman: Roger Derby (Massachusetts Institute of Technology, USA)

<i>Electrical Design of the Westinghouse Superconducting Magnet for the Large Coil Program</i> , S.K. Singh, P.C. Gaberson, C.J. Heyne, E.A. Ibrahim (Westinghouse Electric Corporation, USA)	36
<i>Conceptual Designs of Heaters for the Westinghouse Large Coil Program</i> , S.K. Singh, C.J. Heyne, E. A. Ibrahim (Westinghouse Electric Corporation, USA)	41
<i>Contribution of Computer Graphics to the Finite Element Analysis of the PDX Tokamak</i> , T. Campbell, P. Mason, S. Iaccarino, K. Johnston (Grumman Aerospace Corporation, USA)	45
<i>Fatigue Testing of the PDX TF Coil Joint</i> , E.D. Perry, G.M. Brown (Princeton Plasma Physics Laboratory, USA)	50
<i>Seismic Analysis of the JT-60</i> , H. Takatsu, M. Shimizu (Japan Atomic Energy Research Institute, Japan)	55
<i>Analysis and Test to Predict the Fatigue Life of the ISX-B Toroidal Field Coils' Finger Joints</i> , J.A. O'Toole, I.U. Ojalvo, G.I. Raynor, I.J. Zatz (Grumman Aerospace Corporation, USA); N.E. Johnson, J.C. Walls (Science Applications, USA); B.E. Nelson, W.D. Cain, P.L. Walstrom, J.W. Pearce (Union Carbide Corporation Nuclear Division, USA)	60
<i>The Structural Analysis of ISX-B with a Bundle Divertor</i> , J.C. Walls, N.E. Johnson (Science Applications, USA)	65
<i>The Structural Analysis of Magnetic Fusion Energy Systems in a Combined Interactive/ Batch Computer Environment</i> , N.E. Johnson, M.K. Singhal, J.C. Walls (Science Applications, USA); W.H. Gray (Oak Ridge National Laboratory, USA)	70
<i>Optimization of Currents in Field-Shaping Coils of a Non-Circular Tokamak</i> , H. Ninomiya, K. Shinya (Japan Atomic Energy Research Institute, Japan); A. Kameari (Mitsubishi Electric Corporation, Japan)	75

<i>Stress Analysis and Testing of the Toroidal Field Coil,</i> H. Takano, M. Yamaguchi, T. Uchida, K. Kitamura (Toshiba Corporation, Japan)	81
<i>Special Eddy-Current Theory for the Tokamak Fusion Reactor,</i> K. Denno (New Jersey Institute of Technology, USA)	85
<i>Eddy Current Heating of Irregularly Shaped Plates by Slow Ramped Fields,</i> L. Dresner (Oak Ridge National Laboratory, USA)	89
<i>On Maximum Attainable Magnetic Fields in Toroids and Solenoids Subject to Strain Limitations,</i> W.D. Cain, W.H. Gray (Oak Ridge National Laboratory, USA)	94
<i>Determination of a Permissible Size Flaw in the Doublet III Toroidal Field Coil,</i> E.E. Reis, R.A. Sweig, P.W. Trester (General Atomic Company, USA)	98
<i>Calculator Solutions to Magnetic Field and Force Problems,</i> A.R. Harvey (Lawrence Livermore Laboratory, USA)	103
<i>Force Analysis in the Superconducting Toroidal System of Tokamak Reactor, for All the Possible Fault Conditions,</i> G. Pasotti, M.V. Ricci (C.N.E.N. Laboratorio Superconduttività Centro di Frascati, Italy)	109
<i>Resistance Welding: Solution to Superconducting Magnet Joints,</i> P.A. Sanger and E. Gregory (Aircro Central Research Laboratories, USA)	112

SESSION 2. MAGNET DESIGN—CONVENTIONAL COILS

Tuesday, November 13, 1979

Chairman: Jack Joyce (Argonne National Laboratory, USA)

<i>TFTR TF Coil Support Restraint Structure,</i> L. Blumenau (Ebasco Services, Inc., USA); J. Citrolo J. Bialek (Princeton Plasma Physics Laboratory, USA); G. Cargulia (Grumman Aerospace Corporation, USA)	113
<i>Brazing of Large Section Water-Cooled Copper Conductor on TFTR,</i> J.B. Tobias (Westinghouse Electric Corporation, USA)	117
<i>Electrical Insulation System Development Experiences and Test Results for TFTR Magnetic Field Coils,</i> H.G. Johnson, M.W. Liberi, T.G. Meighan (Princeton Plasma Physics Laboratory, USA)	124
<i>Magnetic Design of TFTR Poloidal Coil Systems,</i> M. Pelovitz (Princeton Plasma Physics Laboratory, USA)	129
<i>TFTR Outer PF Coils Insulation and Mold Design,</i> K.S.C. Young (Princeton Plasma Physics Laboratory, USA)	133
<i>Tooling and Manufacture of Coils for Fusion Research,</i> T.W. Linton, P.G. Snook, K.L. Lee, J.H. Chrzanowski, A. Riddick, M.W. Liberi (Princeton Plasma Physics Laboratory, USA)	139
<i>Cryogenic Electrical Tests on Tokamak Insulation Systems,</i> S.K. Singh, A.I. Bennett (Westinghouse Electric Corporation, USA)	144
<i>Steady-State Resistive Toroidal-Field Coils for Tokamak Reactors,</i> J. Kalnavarns, D.L. Jassby (Princeton Plasma Physics Laboratory, USA)	148
<i>PDX Power Test Results,</i> G.M. Brown, P. Rogoff (Princeton Plasma Physics Laboratory, USA)	154

<i>The TMX Magnet System, Present and Future</i> , R.L. Wong, L. R. Pedrotti, G.A. Leavitt, A.F. Waugh, A.K. Chargin, M.O. Calderon (Lawrence Livermore Laboratory, USA)	158
<i>Experimental Verification of a Poloidal Field Coil Code</i> , J.F. Benesch, G.L. Cardwell (The University of Texas at Austin, USA)	163
<i>TEXT TF Coil Fabrication</i> , R.L. DeBlois, D.J. McFarlin, E.P. Gagnon, J. Flori (United Technologies Research Center, USA)	166
<i>Design, Fabrication, and Testing of the PIACE-R1 Machine</i> , S. Goto T. Uyama (Osaka University, Japan); T. Yokoto, H. Takano, O. Ohsaki, K. Masuda, E. Koyanagi, Y. Sanada (Toshiba Corporation, Japan)	171
<i>The DITE Tokamak Bundle Diverter (Mk II)</i> , H.J. Crawley, K.M. Plummer, B.C. Sanders, V.K. Thompson, G.L. Varley (Culham Laboratory, UK)	177
<i>Possible Incorporation of a Dee-Shaped Vacuum Vessel in Doublet III</i> , L.G. Davis, J.M. Rawls (General Atomic Company, USA)	182
<i>Final Design and Performance of a Two Gap Magnet</i> , R. DeWitt (Lawrence Berkeley Laboratory, USA)	187

SESSION 3. BEAM DEVELOPMENT—GENERAL

Tuesday, November 13, 1979

Chairman: Ernie Thompson (Culham Laboratory, UK)

<i>The U.S. Neutral Beam Development Program—Status and Plans</i> , F.E. Coffman, G.M. Haas, H.S. Staten (Department of Energy, USA)	191
<i>Design and Development of Neutral Beam Module Components</i> , P.M. Holl, R.H. Bulmer, L.W. Dilgard, J.A. Horvath, A.W. Molvik, G. D. Porter (Lawrence Livermore Laboratory, USA); J.S. Colonias (Lawrence Berkeley Laboratory, USA)	195
<i>Ion Source Development at JAERI</i> , Y. Ohara, M. Akiba, Y. Arakawa, H. Horiike, M. Kawai, S. Matsuda, Y. Mizutani, T. Ohga, Y. Okumura, J. Sakuraba, T. Shibata, H. Shirakata, S. Tanaka (Japan Atomic Energy Research Institute, Japan)	198
<i>The Beta-II Plasma-Gun Mechanical Design and Construction</i> , L.R. Pedrotti, G.A. Deis, R.L. Wong, M.O. Calderon, A.K. Chargin, D.R. Garner (Lawrence Livermore Laboratory, USA)	203
<i>A 24-MW Neutral-Beam Injector of 400-keV H⁰</i> , J.H. Fink, G.W. Hamilton, J.L. Erickson (Lawrence Livermore Laboratory, USA)	209
<i>Development of 120 keV Neutral Beam Injectors</i> , K.H. Berkner, C. F. Burrell, W.S. Cooper, K.W. Ehlers, A. F. Lietzke, H.M. Owren, J.A. Paterson, R.V. Pyle, J. W. Stearns (Lawrence Berkeley Laboratory, USA)	214
<i>Engineering Design of a 40-kV Neutral-Beam Source</i> , T.J. Duffy, A.W. Molvik, E.D. Baird, D.L. Correll, R.H. Munger, K. Gillespie, E.D. Holland, J. A. Pastrone (Lawrence Livermore Laboratory, USA); G.T. Santamaria (Maxwell Laboratories, USA)	217
<i>Some Aspects of the Stationary Ion Sources Constructing</i> , N.N. Semashko, A.A. Panasenkov, V.M. Kulygin (Kurchatov Institute of Atomic Energy, USSR)	221

<i>Electrode Cooling for Long Pulse High Current Ion Sources,</i> R.B. McKenzie-Wilson, K. Prelec (Brookhaven National Laboratory, USA); R. Hruda (Westinghouse Electric Corporation, USA)	225
--	-----

SESSION 4. SUPERCONDUCTOR DEVELOPMENT

Tuesday, November 13, 1979

Chairman: Eric Gregory (Airco Central Research Laboratories, USA)

<i>Review of Recent Developments of Multifilamentary Nb₃Sn by "In Situ" and Cold Powder Metallurgy Processes,</i> S. Foner, R. Roberge (Institute de Recherche de L'Hydro-Quebec, Canada); J.L. Fihey, R. Flukiger (Univ. of Geneva, Switzerland); R. Akihama (Nihon University, Japan); E.J. McNiff, B.B. Schwartz (Massachusetts Institute of Technology, USA)	230
<i>Effects of Differential Thermal Contraction Between The Matrix and the Filaments on the Superconducting Critical Temperature of Mono- and Multi-Filamentary Nb₃Sn,</i> K. Aihara, M. Suenaga, T. Luhman (Brookhaven National Laboratory, USA)	236
<i>An Analysis of Critical Current-Bend Strain Relationships in Composite Nb₃Sn Superconducting Wires,</i> T. Luhman, D.O. Welch (Brookhaven National Laboratory, USA)	241
<i>Progress on Lawrence Livermore Laboratory's Superconducting High Field Test Facility,</i> D.N. Cornish, H.L. Harrison, A.M. Jewell, R.L. Leber, A.R. Rosdahl, R.M. Scanlan, J.P. Zbasnik (Lawrence Livermore Laboratory, USA)	245
<i>High Field J_c and Scaling Laws in Nb-Ti and Alloyed Nb-Ti,</i> D.G. Hawkworth, D.C. Larbalestier (University of Wisconsin, USA)	249
<i>NbTi Based Conductors for Use in 12 Tesla Toroidal Field Coils,</i> H.R. Segal, T.M. Hrycaj, Z.J.J. Stekly, T.A. de Winter, K. Hemachalam (Magnetic Corporation of America, USA)	255
<i>Manufacturing and Quality Assurance for the MFTF Superconductor Core,</i> R.M. Scanlan, J.E. Johnston, P.A. Waide (Lawrence Livermore Laboratory, USA); B.A. Zeitlin, G.B. Smith, C.T. Nelson (Intermagetics General Corporation, USA)	260
<i>Fabrication and Testing of the Nb₃Sn Superconductor for High-Field Test Facility (HFTF),</i> C. Spencer, E. Adam, E. Gregory, W. Marancik, P. Sanger (Airco Central Research Laboratories, USA); R. Scanlan, D. Cornish (Lawrence Livermore Laboratory, USA)	265
<i>Cluster Test Facility Construction and Its Future Perspective,</i> S. Shimamoto, T. Ando, T. Hiyama, H. Tsuji, K. Yoshida, E. Tada, M. Nishi, K. Okuno, K. Koizumi, K. Yasukouchi (Japan Atomic Energy Research Institute, Japan)	269
<i>Effect of Ta and Zr Additions to Ti-Nb Alloys on Superconducting Properties,</i> T. Horiuchi, K. Matsumoto, Y. Monju (Asada Research Laboratory, Japan)	274

SESSION 5. EXPERIMENTAL SYSTEMS

Tuesday, November 13, 1979

Chairman: John Pitts (Lawrence Livermore Laboratory, USA)

<i>TEXT Overview and Status Report,</i> D. Brower, G. Cardwell, K. Gentle, W. Harris, S. Hutchins, M. Sfleets, P. Wildi (The University of Texas at Austin, USA)	278
---	-----

<i>The Beta II Field-Reversed Experiment</i> , R.R. Rubert, S.R. Bishop, A.K. Chargin, M.O. Calderon (Lawrence Livermore Laboratory, USA)	282
<i>SLPX—Superconducting Long-Pulse Experiment</i> , P.U. Tiger, D.L. Jassby, J. File, P.J. Reardon (Princeton Plasma Physics Laboratory, USA)	286
<i>Design of RST—An RF-Driven Steady-State Toroidal Experiment</i> , J.A. Dalessandro, L.R. Bikadi, W.Y. Chen, M.C. Henderson, W.G. Homeyer, G.W. Morgan, J.D. Orr, R. Prater, G.W. Smith (General Atomic Company, USA)	292
<i>Mechanical Design Aspects of a Large RFP Assembly</i> , A. Bond, K.E. Lavender, R.J. Hucklesby, P.D.F. Jones, J. Phillipott, J.E. Partridge (Culham Laboratory, UK)	297
<i>Overview of the MFTF Electrical Systems</i> , W.B. Lindquist, R.D. Eckard, T. Holdsworth, L.J. Mooney, D.R. Moyer, R.L. Peterson, D.W. Shimer, R.H. Wyman, H.W. Van Ness (Lawrence Livermore Laboratory, USA)	302
<i>Mechanical Design for a Large Fusion Laser System</i> , C.A. Hurley (Lawrence Livermore Laboratory, USA)	309
<i>Development of a Plasma Streaming System for the Mirror Fusion Test Facility</i> , T. Holdsworth, R.N. Clark, R.E. McCotter, T.L. Rossow (Lawrence Livermore Laboratory, USA); G.E. Cruz (EG&G, USA)	313
<i>The Fusion Materials Irradiation Test Facility</i> , E.L. Kemp, A.L. Trego (Los Alamos Scientific Laboratory, USA)	318
<i>Start-up Neutral-Beam Power Supply System for MFTF</i> , L.J. Mooney (Lawrence Livermore Laboratory, USA)	323

SESSION 6. POWER SUPPLIES

Tuesday, November 13, 1979

Chairman: Bill Nunnally (Los Alamos Scientific Laboratory, USA)

<i>TFTR Neutral Beam Power System</i> , A. Deitz, R. Winje, H. Murray (Princeton Plasma Physics Laboratory, USA)	329
<i>The ORNL ISX-B Neutral Beam Power System</i> , C.W. Murphy, G.C. Barber, S.C. Bates, P.H. Edmonds, D.H. Gray, C.M. Loring, N.S. Ponte, J.A. White, R.E. Wright (Oak Ridge National Laboratory, USA)	334
<i>The Sustaining Neutral Beam Power Supply System for the Mirror Fusion Test Facility</i> , R.D. Eckard, H.W. Van Ness (Lawrence Livermore Laboratory, USA); H. Stern (Aydin Energy Division, USA)	337
<i>Computer Modeling with ASTAP of the Sustaining Neutral-Beam Power Supply System of the MFTF</i> , B.P. Ficklin, G.E. Tallmadge, M.F. Williams (SRI, USA)	341
<i>A Digital Simulation of the MFTF Power Supply System Using EMTP</i> , A.M. Mihalka (Lawrence Livermore Laboratory, USA)	347
<i>AC Voltage Behavior of Poloidal Field Power Supply System for JT-60</i> , S. Tamura, R. Shimada (Japan Atomic Energy Research Institute, Japan); T. Shibata, K. Koyanagi (Toshiba Corporation, Japan)	352

<i>Electrical Supply System for the TFTR Equilibrium Field Coils,</i> P. Bellomo, G. Karady, F. Petree (Ebasco Services, Inc., USA); R. Cassel (Princeton Plasma Physics Laboratory, USA)	357
<i>Toroidal Field Power Supply for the TEXT Tokamak,</i> L. Farkas, L.R. Nakauchi (Gulton Industries, Inc., USA); P. Wildi (The University of Texas at Austin, USA)	362
<i>SF-EF Rectifier Upgrade Study,</i> W.A. Griesmyer (Princeton Plasma Physics Laboratory, USA)	366
<i>Protective Devices for the TFTR Energy Conversion and Storage Systems,</i> C. Neumeier, S. Ramakrishnan, W. Moo (Ebasco Services, Inc., USA); R. Cassel (Princeton Plasma Physics Laboratory, USA)	369

SESSION 7. FUSION REACTOR ENGINEERING

Tuesday, November 13, 1979

Chairman: Bill Gough (Department of Energy, USA)

<i>Theoretical and Practical Considerations in Forming Uniform Solid Fuel Layers Inside "Vacuum" Layered Inertial Confinement Fusion Targets,</i> D.L. Musinski, R.J. Simms (KMS, USA); R.B. Jacobs (R.B. Jacobs Assoc., USA)	376
<i>Thermal Vibrations of Cylindrical Shells with Applications to Laser Fusion Reactors,</i> H. Ray (Lockheed Missiles and Space Co., USA); E.G. Lovell (University of Wisconsin, USA)	382
<i>Liquid Lithium Blanket Processing Studies,</i> J.B. Talbot, S.D. Clinton (Oak Ridge National Laboratory, USA)	389
<i>Stresses in Liquid Lithium Modules in a Tokamak Blanket Due to a Changing Poloidal Magnetic Field,</i> J.S. Walker (University of Illinois, USA); W.M. Wells (Oak Ridge National Laboratory, USA)	394
<i>Tokamak Reactor Poloidal Field System Study,</i> T.G. Brown, G.W. Wiseman (Grumman Aerospace Corporation, USA); Y-K.M. Peng (Oak Ridge National Laboratory, USA)	399
<i>Evaluation of the Impact of a Committed Site on Fusion Reactor Development,</i> R.L. Reid (Oak Ridge National Laboratory, USA); A. Nagy (Bechtel National, USA)	411
<i>Design Considerations for the Fusion Engineering Test Facility,</i> P.H. Sager (General Atomic Company, USA)	416
<i>The HFCTR Demonstration Reactor Design Study: Advantages of High Force Density Magnets and Total Modularization,</i> J.H. Schultz, F.S. Malick (Westinghouse Electric Corporation, USA); D.R. Cohn, J.E.C. Williams (Massachusetts Institute of Technology, USA)	421
<i>Large Aspect Ratio Tokamak Study,</i> R.L. Reid, J.A. Holmes, W.A. Houlberg, Y-K.M. Peng, D.J. Strickler (Oak Ridge National Laboratory, USA); T.G. Brown, C. Sardella, G.W. Wiseman (Grumman Aerospace Corporation, USA)	427
<i>Assessment of Solid Breeding Blanket Options for Commercial Tokamak Reactors,</i> D.L. Smith, R.G. Clemmer (Argonne National Laboratory, USA); J.W. Davis (McDonnell-Douglas Astronautics, USA)	433

SESSION 8. INSTRUMENTATION AND DIAGNOSTICS

Tuesday, November 13, 1979

Chairman: Dave Pehrson (Lawrence Livermore Laboratory, USA)

TMX Magnet Control System,
D.A. Goerz, G.G. Pollock (Lawrence Livermore Laboratory, USA) 439

Design of a Fiber Optic Multi-Tapped Computer Bus for a Pulsed Power Control System Application, D.G. Gritton, L.W. Berkbigler, J.A. Oicles (Lawrence Livermore Laboratory, USA) 443

Mirror Fusion Test Facility Plasma Diagnostics System,
S.R. Thomas, Jr., F.E. Coffield, G.E. Davis, B. Felker (Lawrence Livermore Laboratory, USA) . . . 448

General Arrangement of Diagnostics on TFTR,
S. Goldfarb, K.M. Young (Princeton Plasma Physics Laboratory, USA) 453

The Large Coil Test Facility Instrumentation System Design, P.L. Walstrom, W.M. Fletcher, J.S. Goddard, J.L. Murphy (Oak Ridge National Laboratory, USA) 459

Protection Instrumentation for a Large Superconducting Magnet,
J.M. Reschovsky, P.C. Brown, W.R. Court, W.E. Overstreet (General Electric Company, USA) . . . 464

Design of a High-Speed Rotating Mechanical Shutter,
I.F. Stowers, B.T. Merritt, C.B. McFann (Lawrence Livermore Laboratory, USA) 470

Mechanical Design of a Neutron Spectrometer for TFTR,
A.D. Hay (Princeton Plasma Physics Laboratory, USA) 475

The Use of Lasers for Accelerator Diagnostics: I. Elementary Concepts,
J.P. Aldridge, T.D. Hayward (Los Alamos Scientific Laboratory, USA) 479

The Detection of a Normal Zone in Inductively Coupled Superconducting Coils,
E.W. Owen (Lawrence Livermore Laboratory, USA) 482

SESSION 9. VACUUM SYSTEMS, VESSELS, AND COMPONENTS

Wednesday, November 14, 1979

Chairman: Howard Patton (Lawrence Livermore Laboratory, USA)

Vacuum Pumping System for TFTR,
B.D. Abel (Grumman Aerospace Corporation, USA) 488

Vacuum System for the Tandem Mirror Experiment,
M.J. Richardson, D.P. Atkinson, M.O. Calderon (Lawrence Livermore Laboratory, USA) 493

Installation and Operation of Cryoliners in the TMX Vacuum System,
J. Jolly, J. Parkinson, D. Swan (Lawrence Livermore Laboratory, USA) 497

The Vacuum System of the ETA-BETA II RFP Experiment,
A. Buffa, A. Stella (EURATOM-CNR, Italy) 500

In-Torus Surface Pumping for the TFTR Flexibility Modification,
J.J. Sredniawski (Grumman Aerospace Corporation, USA) 505

<i>Vacuum Pumping of Tritium in Fusion Power Reactors</i> , D.O. Coffin (Los Alamos Scientific Laboratory, USA); C.R. Walthers (Grumman Aerospace Corporation, USA)	513
<i>New Transient Simulation Analysis of the Vacuum System in NBI</i> , A. Maekawa, S. Isobe, I. Uede, Y. Ono (Hitachi Research Laboratory, Japan); T. Obiki A. Sasaki, A. Iiyoshi, K. Uo (Kyoto University, Japan)	518
<i>Development of Large Diameter Metal Gaskets for Sealing Ultra-High Vacuum Flange Connections</i> , A. Miyahara (Nagoya University, Japan); S. Ito, K. Nakayama, M. Kagaya (Toshiba Corporation, Japan)	524
<i>Development of Bakeable Seals for Large Noncircular Ports on the Tokamak Fusion Test Reactor</i> , R.B. Fleming, R.W. Brocker, D.H. Mullaney (Princeton Plasma Physics Laboratory, USA); C. Knapp (Grumman Aerospace Corporation, USA)	528
<i>Strength and Fatigue Aspects of the TFTR Vacuum Vessel Bellows Design</i> , G. Listvinsky, N.V. Kountouras (Ebasco Services, Inc., USA); J. Wittko (Grumman Aerospace Corporation, USA)	529
<i>Black Coating Material for Chevron Baffles of Cryogenic Pumping Panels</i> , S. Isobe, T. Uede (Hitachi Research Laboratory, Japan); T. Shibata, H. Shirakata, S. Matsuda (Japan Atomic Energy Research Institute, Japan)	533
<i>Outgassing Measurements and Results Used in Designing the Doublet III Neutral Beam Injector System</i> , R.M. Yamamoto, J. Harvey (Lawrence Berkeley Laboratory, USA)	537
<i>A Demonstration Power Tokamak Reactor with Vacuum Outer Containment: Feasibility Study of the Vacuum System Including Mechanically Sealed Toroidal Segments</i> , F. Farfaletti-Casali, F. Reiter (Commission of European Communities Joint Research Center, ISPRA, Italy)	542
<i>Noel—A No-Leak Fusion Blanket Concept</i> , W.S. Yu, J.R. Powell, J.A. Fillo, F. Horn, T.A. Makowitz (Brookhaven National Laboratory, USA)	547
<i>Thermal and Hydraulic Analysis of A Helium-Cooled Blanket and First Wall Design Concept for Tokamaks</i> , A.Y. Lee (Westinghouse Electric Corporation, USA)	555
<i>Alternatives for Contaminant Control During MFTF Plasma Buildup</i> , J.M. Khan, L.E. Valby (Lawrence Livermore Laboratory, USA)	559
<i>Doublet III Vacuum Vessel Neutral Beam Armor</i> , L. Sevier, E. Bailey, L. Davis, T. McKelvey, R. Smith (General Atomic Company, USA)	564
<i>Limiter-Pumping System for Divertorless Tokamaks</i> , R.W. Conn, I.N. Sviatoslavsky, D.K. Sze (University of Wisconsin, USA)	568