Sunday evening, 1 October 1995

Oral - Informal Panel
8:30 - 10:00 pm - University Hall

Moderator: S. O. Dean, *FPA*

1001 **A Strategy for Fusion Energy Development**
S. O. Dean
Fusion Power Associates, Gaithersburg, MD, USA

1002 **Role of Innovations in Fusion Research**
D. Ryutov
Budker Institute of Nuclear Physics, Novosibirsk, RUSSIA

1003 **Role of Alternate Concepts**
G. H. Miley
University of Illinois at Urbana-Champaign

1004 **Magnetized Target Fusion**
R. C. Kirkpatrick
Los Alamos National Laboratory, Los Alamos, NM, USA

1005 **French D-T Laser Fusion**
D. C. Schirmann
CEA-Centre d'Etudes de Limeil-Valenton, FRANCE

Monday morning, 2 October 1995

Opening Plenary Session
8:30 am - 12:15 pm – University Hall

8:30 1100 **Welcome to SOFE '95**
Professor G. H. Miley
Fusion Studies Laboratory
University of Illinois at Urbana-Champaign

Session Chair: G. H. Miley, *UIUC*

9:00 1101 **Keynote Speaker**
A. Davies
US Department of Energy

9:45 1102 **Keynote Speaker**
R. Aymar
ITER Joint Central Team, San Diego JWS

10:30 **Break – Exhibit Hall**
Midwest Ballroom

Session Chairs: A. Gulevich, *IPPE*, and J. Quintez, *SNL*

10:45 1103 **New Issues and Directions in the US Inertial Confinement Program**
M. Sluyter
US Department of Energy

11:30 1104 **Plenary Speaker**
E. M. Campbell
Lawrence Livermore National Laboratory

12:15 - 1:30 **Luncheon**
Alumni Room

Monday morning, 2 October 1995
9:00 am - 12:30 pm – Exhibit Hall, Midwest Ballroom

Poster Session – Spherical Configurations

Session Chair: Martin Peng, *ORNL*, and N. P. Taylor, *UKAEA*

0101 **Spherical Tokamaks for Transmutation of Nuclear Wastes**
Y-K. M. Peng, J. D. Galambos, E. T. Cheng and R. J. Cerbone
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0102 **Engineering Overview of the National Spherical Tokamak Experiment**
J. H. Chrzanowski, H. M. Fan, P. J. Heitzenroeder, M. Ono and J. Robinson
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0103 **Neutronics Study of a Spherical Tokamak for Component Testing**
N. P. Taylor
UKAEA Government Division Fusion, Culham Laboratory, Abingdon, Oxfordshire, UNITED KINGDOM

0104 **Conceptual Analysis and Design of the NSTX Vacuum Vessel and Support Structures**
H. M. Fan, M. Ono, G. Sheffield, J. Bialek and J. Robinson
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0105 **Status of the START Neutral Beam Injection Project**
M. Nightingale, G. Barber, D. Codling, M. Hood, Y.K. M. Peng, D. Schechter, R. Smith, C. Tsai and S. Warder
UKAEA Government Division, Fusion, Culham Laboratory, Abingdon, Oxon, UNITED KINGDOM

0106 **Solenoid Design for MAST**
J. McKenzie and G. Voss
UKAEA Government Division, Fusion, Culham Laboratory, Abingdon, Oxon, UNITED KINGDOM

0107 **The Mega Amp Spherical Tokamak**
A. Darke, M. Cox, J. Harbar, J. Hay, J. Hicks, J. Hill, D. Hurford, J. McKenzie, A. Morris, M. Nightingale, T. Todd, G. Voss and J. Watkins
UKAEA Government Division, Fusion, Culham Laboratory, Abingdon, Oxon, UNITED KINGDOM

0108 **GLOBUS-M Central Solenoid**
V. Gusev, V. Nikolaev, K. Podushnikova, N. Sakharov, V. Shpeizman,V. Bykov, A. Kavin, V. Korotkov, A. Panin and V. Soikin
A. F. Ioffe Physico-Technical Institute, St. Petersburg, RUSSIA

0109 **GLOBUS-M, From Concept to Engineering**
V. Golant, V. Gusev, V. Minaev, A. Novokhatzky, K. Podushnikova, N. Sakharov, K. Shakhovetz, V. Uzlov, V. Belyakov, V. Divavin, A. Kasatkin, A. Kavin, V. Korotkov, Yu. Kostzov, Yu. Krivchenkov, A. Molkov, Yu. Utin, N. Dvorkin, G. Gardymov, V. Mikov, A. Polevoi, Y.-K. Peng and R. Colchin
A. F. Ioffe Physico-Technical Institute, St. Petersburg, RUSSIA

0110 **The New Paradigm for Low Aspect Ratio Tokamak Design, the University Spherical Tokamak Experiment**
P. H. Edmonds for the USTX design team
University of Texas at Austin, Austin, TX, USA

0111 **Inertial Electrostatic Confinement for Neutron and Power Production**
G. H. Miley
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0112 **Multi-Potential Well Formation in Inertial Electrostatic Confinement Fusion by Numerical Simulations**
M. Ohnishi, Y. Yamamoto, K. Yoshikawa, K. Sato and G. H. Miley
Institute of Atomic Energy, Kyoto University, Uji, Kyoto, JAPAN

0113 **Assessment of Existing IEC Models and Future Needs**
J. H. Nadler and D. A. Knoll
Department of Energy, Idaho Ops Office, Idaho Falls, ID, USA

0114 **Effects of Ion Angular Momentum in Inertial Electrostatic Confinement**
I. V. Tzonev, J. DeMora and G. H. Miley
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0115 **Development of an IEC Neutron Source for NDE**
R. A. Anderl, J. M. DeMora, J. K. Hartwell, J. H. Nadler and R. A. Stubbers
Idaho National Engineering Laboratory, Idaho Falls, ID, USA

0116 **Optimization of IEC Grids Using the SIMION Code**
J. M. DeMora, R. A. Stubbers and R. A. Anderl
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0117 **Tokamak Start-Up with FBX Spherical Torus**
M. Irie
Waseda University, Shinjuku, Tokyo, JAPAN

Monday afternoon, 2 October 1995
1:30 - 2:15 pm – University Hall

Session Chair: P. Massman, *CEA*

1:30 1200 Plenary Speaker
The ITER Magnet System Program - Design and R&D
M. Huguet and R. J. Thome
ITER Joint Central Team, Naka-gun, Ibaraki-ken, JAPAN

2:15 - 2:40 **Break**

Oral Session A – ITER Overview
2:40 - 5:00 pm – Zuppke-Brundage Room

Session Chairs: K. Dietz, *ITER*, and J. Walker, *UIUC*

2:40 1201 **Physics Requirements for ITER Systems**
N. Sauthoff, F. Perkins, T. Amano, D. Boucher, S. Cohen, N. Fujisawa, G. Janeschitz, V. Mukhovatov, W. Nevins, S. Ortolani, D. Post, S. Putvinski, M. Rosenbluth, N. Uckan, J. Wesley and K. Young
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

3:10 1202 **Development of the ITER Divertor**
K. J. Dietz and the ITER Joint Central Team and Home Teams
ITER Joint Central Team, Garching, GERMANY

3:30 1203 **ITER Shield Blanket and Vacuum Vessel**
K. Ioki, A. Cardella, F. Elio, Y. Gohar, T. Iizuka, G. Johnson, G. Kalinin, D. Lousteau, K. Mohri, R. Parker, R. Raffray, R. Santoro, K. Shimizu, N. Tachikawa, T. Takahashi, D. Williamson and E. Zolti
ITER Joint Central Team, Garching, GERMANY

4:00 1204 **Disruptions, Loads, and Dynamic Response of ITER**
B. Nelson, B. Riemer, R. Sayer, D. Strickler, P. Barabaschi, K. Ioki, G. Johnson, K. Shimizu and D. Williamson
Oak Ridge National Laboratory, Oak Ridge, TN, USA

4:30 1205 **Nuclear Analyses in Support of ITER Design**
R. T. Santoro and the ITER Joint Central Team and Home Teams
ITER Joint Central Team, Garching, GERMANY

Monday afternoon, 2 October 1995

Oral Session B – Tokamaks
2:40 - 5:00 pm – Illiniwek-Grange Room

Session Chairs: A. Sykes, *UKAEA*, and T. Kimura, *JAERI*

2:40 2201 **Extension of TFTR Operations to Higher Toroidal Field Levels**
R. D. Woolley and the TFTR Group
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

3:10 2202 **JET with a Pumped Divertor—Technical Issues and Main Results**
E. Bertolini and the JET Team
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

3:30 2203 **Engineering Analysis of JET Operation**
E. Bertolini, M. Buzio, P. Noll, T. Raimondi, G. Sannazzaro and M. Verrecchia
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

4:00 2204 **Plasma Physics Programme at TEXTOR-94**
U. Samm
Forschungszentrum Jülich GmbH, Jülich, GERMANY

4:30 2205 **The Cadarache Negative Ion Experiments**
P. Massman, Y. Belchenko, J. Bucalossi, C. Desgranges, M. Furnelli, C. Jacquot, J. Paméla, D. Riz, A. Simonin and R. Trainham
CE Cadarache, DRFC/STID, St. Paul lez Durance, FRANCE

Monday afternoon, 2 October 1995
2:00 - 5:00 pm – Exhibit Hall, Midwest Ballroom

Poster Session – ICF; Reactor Components

Session Chairs: D. B. Harris, *LANL*, and W. J. Hogan, *LLNL*

0201 **High Pressure Cryogenic Valve for Tritium Use**
R. A. Mangano, N. B. Alexander, R. L. Fagaly and J. Leaming
General Atomics, San Diego, CA, USA

0202 **A Novel First Wall Protection Scheme for Ion Beam ICF Reactors**
E. Mogahed, P. Cousseau, R. Engelstad, R. Peterson, H. Khater, G. Kulcinski, J. MacFarlane, P. Wang, M. Sawan, I. Sviatoslavsky and L. Wittenberg
Fusion Technology Institute, University of Wisconsin-Madison, Madison, WI, USA

0203 **Geometric and Blast Effects on the Stability of Thin Film IFE Cavity Protection Schemes**
N. B. Morley, A. Ying and M. A. Abdou
University of California-Los Angeles, Los Angeles, CA, USA

0204 **Inertial Confinement Fusion Target Insertion via Augmented Mass Free Fall**
R. L. Fagaly, L. C. Brown, R. B. Stephens and M. Wittman
General Atomics, San Diego, CA, USA

0205 **Moving Cyostat Target Insertion System for the OMEGA Upgrade ICF Laser**
L. C. Brown, K. K. Boline, C. R. Gibson, M. J. Hansink and G. J. Laughon
General Atomics, San Diego, CA, USA

0206 **Three-Dimensional Neutronics Analysis for the Final Optics of the Laser Fusion Power Reactor SIRIUS-P**
M. E. Sawan
Fusion Technology Institute, University of Wisconsin-Madison, Madison, WI, USA

0207 **X-ray Deposition in Inertial Fusion Graphite and Silicon Carbide First Walls**
A. El-Azab and M. Z. Youssef
University of California-Los Angeles, Los Angeles, CA, USA

0208 **2D Simulation of Acceleration and Compression of Plasma Foils Inside Cylindrical and Conical Microducts**
L. Chacón, J. M. Martínez-Val and P. Velarde
Institute of Nuclear Fusion, Madrid Polytechnic University, Madrid, SPAIN

0209 **Spinning Targets for Laser Fusion**
D. E. Baldwin and D. D. Ryutov
Lawrence Livermore National Laboratory, Livermore, CA, USA

0210 **Inertial Confinement Fusion Target Insertion Concepts for the National Ignition Facility**
G. J. Laughon
General Atomics, San Diego, CA, USA

0211 **The Computational Optimization of ICF Indirect-Drive Targets**
V. A. Lykov, E. N. Avrorin, M. Yu. Kozmanov, V. A. Murashkina, Y. Z. Kandiev, V. E. Chernyakov and N. G. Karlykhanov
Russian Federal Nuclear Center, VNIITF, Sneszhinsk, Chelyabinsk-70, RUSSIA

0212 **Noncontact Coating of Spherical-Shell ICF Targets Using Gas-Dynamic Levitation and Charged Liquid Cluster Beam**
K. Kim, Q. Feng and C. Ryu
Fusion Technology Laboratory, Urbana, IL, USA

0213 **Phenomenology of Chamber Responses to Target Emissions: NIF Experiments**
M. Tobin, A. Anderson, T. Diaz De La Rubia, P. Peterson, B. Peterson and M. Perlado
Lawrence Livermore National Laboratory, Livermore, CA, USA

0214 **Liquid First Wall and Blanket Development on the NIF and other Facilities**
R. W. Moir
Lawrence Livermore National Laboratory, Livermore, CA, USA

0215 **Optical Properties of Drivers Based on Liquids Excited by Fission Fragments of Uranium Nuclei**
A. N. Sizov
All-Russia Institute of Experimental Physics VNIIEF, Arzamas-16, RUSSIA

0216 **High Power Pulsed Reactor-Pumped Laser System for Inertial Confinement Fusion Feasibility**
A. P. Barzilov, A. V. Gulevich, P. P. Dyachenko, V. N. Kononov, O. F. Kukharchuk, E. A. Seregina and A. V. Zrodnikov
Insitute of Physics & Power Engineering, Obninsk, Kaluga Region, RUSSIA

0217 **Concept of a Coupled Blanket System for the Hybrid Fission-Fusion Reactor**
A. Barsilov, A. Gulevich, A. Zrodnikov, O. Kukharchuk, V. Polevoy and L. Feoktistov
Institute of Physics & Power Engineering, Obninsk, Kaluga Region, RUSSIA

0218 **Sub-Megajoule Liner Implosion of a Closed Field Line Configuration.**
R. P. Drake, J. H. Hammer, C. W. Hartman, L. J. Perkins and D. D. Ryutov
Lawrence Livermore National Laboratory, Livermore, CA, USA

0219 **Energy Conversion and Concentration in a High-Current Gaseous Discharge: Dense Plasma Spheromak in Plasma Focus Experiments**
A. B. Kukushkin, V. A. Rantsev-Kartinov and A. R. Terentiev
Nuclear Fusion Institute, Moscow, RUSSIA

0220 **MRX Flux Core Design and Fabrication**
F. Dahlgren, M. Yamada, N. Pomphrey and J. Bialek
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0221 **The Investigation of Stimulated Raman and Brillouin Scattering in Laser-Produced Plasma for Heating Wavelength of 0.53 μm**
E. A. Bolkhovitinov, V. Yu. Bychenkov, A. V. Kilpio, N. G. Kiselev, D. G. Kochiev, M. O. Koshevoi, M. V. Osipov, P. P. Pashinin, A. A. Rupasov, E. V. Shashkov, A. S. Shikanov, Yu. A. Suchkov and V. T. Tikhonchuk
P.N. Lebedev Physical Institute, Moscow, RUSSIA

0222 **Development of a High Sensitivity, Inductively Coupled Miniature Magnetic Probe Array for Detailed Measurement of Time Varying Magnetic Field Profiles in Plasma Flows**
D. C. Black and R. M. Mayo
North Carolina State University, Raleigh, NC, USA

0223 **Planned Upgrade to the Coaxial Plasma Source Facility for High Heat Flux Plasma Flows Relevant to Tokamak Disruption Simulations**
R. W. Caress and R. M. Mayo
North Carolina State University, Raleigh, NC, USA

0224 **Effects of a Toroidal Conducting First Wall on the Mechanical Loading of the Blanket during a Plasma Disruption**
D. Schneider and Th. Jordan
Universität Karlsruhe, Karlsruhe, GERMANY

0225 **Mechanical Performance of First Wall and Divertor Bimetal Panel**
J. Stubbins, J.-K. Shang, B. Thomas and B. Jones
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0226 **Fast Switching, Modular High-Voltage DC/AC Power Supplies for RF-Amplifiers and Other Applications**
N. Tomljenovic, W. Schminke and J. Alex
THOMCAST AG, Turgi, SWITZERLAND

0227 **Plasma-Wall Interactions**
K. L. Wilson
Sandia National Laboratories, Livermore, CA, USA

0228 **Physico-Chemical Stability of SiC/SiC Fiber Ceramic Composite After Exposure to Fusion-Relevant Conditions**
A. Donato, L. F. Moreschi, M. L. Apicella, S. Casadio, R. Coppola, A. Mignone, C. A. Nannetti and E. Scafé
EURATOM-ENEA, C.R., Frascati, Roma, ITALY

0229 **Angularly-Resolved Sputtering of Low-Energy D^+ from Be**
P. C. Smith and D. N. Ruzic
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0230 **Development of Radiation-Resistant Grades of Beryllium for Nuclear and Fusion Facilities**
I. B. Kupriynov, V. A. Gorokhov, G. Nikolaev and V. Burmistrov
A. A. Bochvar All-Russia, Scientific Research Institute of Inorganic Materials, Moscow, RUSSIA

0231 **Helium and Tritium Accumulation and Migration in Beryllium**
I. B. Kupriynov, V. A. Gorokhov and V. V. Vlasov
A. A. Bochvar All-Russia, Scientific Research Institute of Inorganic Materials, Moscow, RUSSIA

0232 **Modelling of Beryllium Swelling Under Neutron Irradiation: Present Status and Future Development**
F. Scaffidi-Argentina and M. C. Billone
Forschungszentrum Karlsruhe, Karlsruhe, GERMANY

0233 **Molecular Dynamics Simulation of Self-sputtering of Plasma Facing Material, Be**
T. Ohsaka and S. Kuwajima
CRC Research Institute, Inc., JAPAN

0234 **Microstructure Changes Due to Ion Irradiation of V-4Cr-4Ti Alloy at 200-425°C**
J. Gazda, M. Meshii, H. M. Chung and B. A. Loomis
Northwestern University, Evanston, IL, USA

0235 **Blanket-Relevant Liquid Metal MHD Channel Flows: Database and Optimization Simulation Development**
I. A. Evtushenko, I. R. Kirillov and S. I. Sidorenkov
D.V. Efremov Institute of Electrophysical Apparatus, St. Petersburg, RUSSIA

0236 **CaO Insulator Coatings and Self-Healing of Defects on V-Alloy in Liquid Lithium System for Fusion Blanket Application**
J.-H. Park and T. F. Kassner
Argonne National Laboratory, Argonne, IL, USA

0237 **EU Reference Concept of Water-Cooled Lithium-Lead Blanket for DEMO**
L. Giancarli, M. Eid, M. Futterer, E. Proust, J. F. Salavy, Y. Severi, A. Terlain, G. Benamati, C. Nardi and L. Petrizzi
CEA, CEN Saclay, Gif-sur-Yvette, FRANCE

0238 **Neutronics and Activation Analysis of a SS316 Based Experimental D-T Fusion Power Reactor**
E. T. Cheng and R. J. Cerbone
TSI Reserch, Inc., Solana Beach, CA, USA

0239 **Activation Analysis of the PULSAR-I Fusion Power Reactor**
H. Y. Khater
Fusion Technology Institute, University of Wisconsin, Madison, WI, USA

0240 **Activation Analysis of the PULSAR-II Fusion Power Reactor**
H. Y. Khater
Fusion Technology Institute, University of Wisconsin, Madison, WI, USA

0241 **Results of the Activation Analysis of the Stellarator Power Plant Study**
H. Y. Khater
Fusion Technology Institute, University of Wisconsin, Madison, WI, USA

0242 **Activation Product Transport in the Helium Cooling Circuit of the SEAFP Plant Model 1**
P. J. Karditsas and C. B. A. Forty
UKAEA Government Division Fusion, Culham Laboratory, Abingdon, Oxon, UNITED KINGDOM

0243 **Demonstration Power Plant Target Designs Meeting Environmental Requirements for Minimal Neutron-Induced Radioactivity**
E. N. Avrorin and V. A. Lykov
Russian Federal Nuclear Center - VNIITF, Sneszhinsk, RUSSIA

0244 **Activation Calculations with EASY-4 on Fusion Relevant Materials - The Significance of Exotic Reactions**
R. A. Forrest
UKAEA Government Division Fusion, Culham Laboratory, Abingdon, Oxon, UNITED KINGDOM

0245 **The ENEA R&D on Low Activation Structural Materials in the Frame of Long-Term Fusion Technology Programme**
A. Donato
EURATOM-ENEA C.R., Frascati, Roma, ITALY

0246 **Radioactivity Induced by Sequential Reactions in Fusion Materials**
A. Kumar
University of California at Los Angeles, Los Angeles, CA, USA

0247 **Programmable Electronics in Safety-Critical Systems - A Practical Survey**
E. Johansson
Royal Institute of Technology, Stockholm, SWEDEN

0248 **Radwaste Considerations for Economics and Siting of ITER and Fusion Power Reactors in Illinois and Elsewhere in the U.S.**
C. Singer, B. Youman
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0249 **ALARA: A New, Comprehensive Activation Code**
P. P. H. Wilson and D. L. Henderson
Fusion Technology Institute, University of Wisconsin, Madison, WI, USA

0250 **Tritium Inventory Measurement by Beta Scintillation Detection**
R. E. Ellefson, B. R. Price and D. S. West
Ellefson Analytical Services, Centerville, OH, USA

0251 **Thermal and Control Dynamics Modelling and Simulation of General Purpose Cold Traps**
P. J. Karditsas and A. Konstantellos
UKAEA Government Division, Abingdon, Oxon, UNITED KINGDOM

0252 **Cleaning Tritiated Laboratory Equipment Using a Plasma Decontamination Facility**
A. B. Antoniazzi and W. T. Shmayda
Ontario Hydro Technologies, Toronto, Ontario, CANADA

0253 **Preliminary Critical Heat Flux Assessment of the High Efficiency Thermal Shield Device**
A. Pizzuto and B. Riccardi
EURATOM-ENEA C.R., Frascati, ITALY

0254 **New Physics for Fusion Energy**
J. R. Roth
University of Tennessee, Knoxville, TN, USA

0255 **Neutron Shielding of the Novosibirsk GDT Neutron Generator Project - A Feasibility Study**
B. V. Robouch, L. Ingrosso, J. S. Brzosko, V. I. Volosov, A. A. Ivanov and Yu. A. Tsidulko
EURATOM-ENEA C.R., Frascati, Rome, ITALY

0256 **The Study on the Possibility to Create Pulse Electron Accelerator and Pulse Nuclear Reactor**
V. S. Bosamykin, M. A. Voinov, V. S. Gordeyev, K. A. Morunov, A. I. Pavlovskii and V. D. Selemir
All Russian Institute of Experimental Physics, VNIIEF, Arzamas-16, RUSSIA

0257 **Fusion Power Reactor Design**
A. A. Ivanov, E. P. Kruglyakov, Yu. A. Tsidulko, V. G. Krasnoperov and V. V. Korshakov
Budker Institute of Nuclear Physics, Novosibirsk, RUSSIA

0258 **Possibilities for Use of State Scientific Centre of the Russian Federation RIAR Experimental Facilities for Efficient Testing of ITER Materials and Components**
V. Ivanov, V. Kazakov, A. Pokrovsky, V. Shamardin, R. Melder and Yu. Revjakin
State Scientific Centre of Russia Federation, Research Institute of Atomic Reactors, Dimitrovgrad-10, Ulyanovsk Region, RUSSIA

0259 **Use of ^{6}LiD Thermal Neutron Converter at IWW-2M Reactor to Simulate Fusion Reactor Irradiation for Materials Testing**
Yu. N. Zouev, Yu. I. Chernykhin, V. D. Lartsev, V. D. Parkhomenko and B. N. Goshchitskii
Institute of Metal Physics, RAS, Yekaterinburg, RUSSIA

0260 **The Investigation of Spectral and Spatial Characteristics of X-ray Films in the Wavelength Range 2-15 nm**
Yu. M. Alexandrov, D. A. Fedin, R. V. Fedorchuk, E. Gullikson, M. O. Koshevoi, I. V. Lukjantsev, V. A. Murashova, A. A. Rupasov, A. S. Shikanov and M. N. Yakimenko
P.N. Lebedev Physics Institute, Moscow, RUSSIA

0261 **Evaluation of Radiation Properties of Gas Media Used in Nuclear-Pumped Lasers**
G. M. Lykash, I. I. Kostenko, V. A. Kryzhanovcky, E. P. Magda, V. M. Myrzin, Yu. A. Cokolov and B. A. Terekhin
Russian Federal Nuclear Center, Chelyabinsk, RUSSIA

0262 **On the Development of the World Nuclear Fusion Program and Ultra-Pure Low-Activation Material Industry**
I. N. Golovin
Institute of Nuclear Fusion, RRC, Moscow, RUSSIA

Monday Evening, 2 October 1995
8:30 - 10:00 pm – Zuppke-Brundage Room

8:30 3000 **NIF Special Session**
Moderator - W. Hogan

8:30 - 10:00 pm – Illiniwek-Grange Room

8:30 4000 Special Panel Discussion
Low-T Fusion

Tuesday morning, 3 October 1995
8:30 -9:15 am – University Hall

Session Chair: K. Schultz, *GA*

8:30 1300 Plenary Speaker
Inertial Fusion Energy Technology Development
W. Dove
US Department of Energy

9:15 - 9:40 **Break**

Oral Session A – ICF
9:40 am - 12:00 n – Zuppke-Brundage Room

Session Chairs: C. Henning, *U. Cal.*, and B. Coppi, *MIT*

9:40 1301 **Resolving Ignition Physics Issues**
M. Cray
Los Alamos National Laboratory, Los Alamos, NM, USA

10:10 1302 **Recent Implosion Experiments on Nova**
T. Murphy
Lawrence Livermore National Laboratory, Livermore, CA, USA

10:30 1303 **Conceptual Design of the National Ignition Facility**
W. J. Hogan and J. A. Paisner
Lawrence Livermore National Laboratory, Livermore, CA, USA

11:00 1304 **Los Alamos Studies of NIF Target Design and Robustness**
W. J. Krauser
Los Alamos National Laboratory, Los Alamos, NM, USA

11:30 1305 **ICF Target Developments**
A. Caruso
ENEA C.R., Frascati, Rome, ITALY

12:00 - 1:30 **Lunch** (on your own)

Tuesday morning, 3 October 1995

Oral Session B – Magnet Technology
9:40 am - 12:00 n – Illiniwek-Grange Room

Session Chairs: P. Heitzenroeder, *PPPL*, and R. Vieira, *ITER*

9:40 2301 **Magnet Design Issues for ITER**
D. B. Montgomery
Plasma Fusion Center, MIT, Cambridge, MA, USA

10:10 2302 **Testing of ITER Central Solenoid Coil Insulation in an Array**
R. Jayakumar, R. P. Reed, S. Perfect and R. P. Walsh
Plasma Fusion Center, MIT, Cambridge, MA, USA

10:30 2303 **ITER Coils Insulation R&D Program**
R. F. Vieira, M. Sugimoto, O. Osaki, T. Fujioka, V. Korsunsky, R. P. Reed, H. Katheder and A. Broadbent
ITER Joint Central Team, Naka-gun, Ibaraki-ken, JAPAN

11:00 2304 **Insulation System Development Activities by the Westinghouse TPX Team for the TPX Magnet System**
P. Sanger, W. Hannan, J. Hillenbrand, G. Lowry, P. McAuliffe, R. Parman, D. Potter, F. Roach, S. Singh and N. Wood
Westinghouse Electric Corporation, Science &, Pittsburgh, PA, USA

11:30 2305 **Design of the Magnetic System and Development of the Operation Modes of the Large-Aspect-Ratio (LAR) Tokamak KT-2**
S. Kim, K. Lee, B. Hong, S. In, C. Chang, S. Hong, J. Lee and J. Kim
Korea Atomic Energy Research Institute, Taejon, KOREA

12:00 - 1:30 **Lunch** (on your own)

Tuesday morning, 3 October 1995
9:00 am - 12:30 pm – Exhibit Hall, Midwest Ballroom

Poster Session – ITER

Session Chairs: A. M. Dawson, *MIT*, and J. N. Doggett, *LLNL*

0301 **Assessment of the Suitability of the European 400 kV Grid to Supply the ITER Load**
E. Bertolini, J. M. Bottereau, D. Crisford, G. D'Andrea, A. DeLorenzi, S. Geeves, J. Jospin, A. Maschio, G. Murphy and P. Scarpellini
European Union ITER Home Team, Padova, ITALY

0302 **Development of Cryopumps for ITER Torus Pumping**
D. Perinic, A. Mack, H. Haas, E. Karb, W. Lehmann, D. Röhrig and D. Murdoch
Forschungszentrum Karlsruhe, Karlsruhe, GERMANY

0303 **Design and Thermal-Hydraulic Analysis of Tokamak Divertor Armor Tile**
T. A. Carter, J. P. Sharpe, M. A. Bourham and J. G. Gilligan
North Carolina State University, Raleigh, NC, USA

0304 **Comparison of Swirl Tube and Hypervapotron for Cooling of ITER High Heat Flux Components**
C. B. Baxi
General Atomics, San Diego, CA, USA

0305 **Development of Plasma Facing Components for Fusion Experimental Reactors**
M. Onozuka, Y. Fujiya, M. Inoue and M. Morimoto
Mitsubishi Heavy Industries, Ltd., Yokohama, JAPAN

0306 **Development of Non-Destructive Examination Techniques for CFC-Metal Joints in Annular Geometry and their Application to the Manufacturing of Plasma Facing Components**
E. Di Pietro, E. Visca, A. Orsini, T. M. R. Borruto, R. Vesprini, C. Cappabianca and P. Varone
Associazione EURATOM-ENEA, Frascati, Rome, ITALY

0307 **Fabrication of a Double-Wall Vacuum Vessel Model of H Type Steel for ITER**
S. Kajiura, K. Ishimura, Y. Ozawa, M. Otsuka, K. Koizumi and E. Tada
Hitachi Works, Hitachi Ltd., Hitachi-shi, Ibaraki-Ken, JAPAN

0308 **Fabrication of Double-walled Section Models of ITER Vacuum Vessel**
K. Koizumi, N. Kanamori, M. Horie, E. Tada, M. Shibui, T. Uchida, S. Kajiura and M. Ohtuka
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0309 **Fabrication of HIPped First Wall Structure for Fusion Experimental Reactor and Preliminary Analyses for its Thermo-mechanical Test**
S. Sato, T. Hashimoto, T. Kuroda, T. Kurasawa, K. Furuya, I. Togami, T. Hatano, M. Akiba, M. Araki, T. Osaki and H. Takatsu
Japan Atomic Energy Research Institute (JAERI), Ibaraki-ken, JAPAN

0310 **An Experimental Investigation of the Post-CHF Enhancement Factor for a Prototypical ITER Divertor Plate with Water Coolant**
T. D. Marshall, R. D. Watson, J. M. McDonald and D. L. Youchison
Sandia National Laboratories, Albuquerque, NM, USA

0311 **Heat Transfer Conditions in Water-Cooling of a Fusion Reactor Divertor**
B. M. Lekakh, J. E. Meyer and M. S. Kazimi
Massachusetts Institute of Technology, Cambridge, MA, USA

0312 **Thermal Fatigue Behavior of US and Russian Grades of Beryllium**
R. D. Watson, D. L. Youchison, D. E. Dombrowski and R. N. Guiniatouline
Sandia National Laboratories, Albuquerque, NM, USA

0313 **Recent R&D Activities on Plasma Facing Components at JAERI**
K. Sato, S. Suzuki, M. Akiba, M. Araki, K. Nakamura, K. Yokoyama, M. Dairaku, K. Watanabe, Y. Okumura and Y. Ohara
Naka Fusion Research Establishment, JAERI, Ibaraki-ken, JAPAN

0314 **Mock-up Tests of Rail-mounted Vehicle Type In-vessel Transporter/Manipulator**
K. Oka, S. Kakudate, S. Fukatsu, K. Taguchi, M. Horie and E. Tada
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0315 **ITER Vertical Target Divertor Simulation Including Elastic Collisions**
D. B. Hayden and D. N. Ruzic
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0316 **Time-to-burnout Data for a Prototypical ITER Divertor Tube During a Simulated Loss of Flow Accident**
T. D. Marshall, R. D. Watson, J. M. McDonald, L. S. Wold, D. L. Youchison and L. C. Cadwallader
Sandia National Laboratories, Albuquerque, NM, USA

0317 **Compatibility of ITER Candidate Materials with Static Gallium**
P. R. Luebbers and O. K. Chopra
Argonne National Laboratory, Argonne, IL, USA

0318 **Hypervapotron Flow Testing with Rapid Prototype Models**
D. Driemeyer, T. Hellwig, D. Kubik, H. Mantz, E. Langenderfer, B. Jones and J. Butler
McDonnell Douglas Aerospace, St. Louis, MO, USA

0319 **Results of the ITER Shielding Blanket Cost Assessment Study**
L. M. Waganer and G. D. Morgan
McDonnell Douglas Aerospace, St. Louis, MO, USA

0320 **3-D Overall Neutronic Analysis of the ITER System**
L. Petrizzi, V. Rado
EURATOM-ENEA Frascati sulla Fusione, Roma, ITALY

0321 **Testing of 1-Pin Blanket Mockup: Analysis of the Experimental Results**
M. Ferrari, F. Di Carlo, M. Furrer, G. Simbolotti and C. Talarico
EURATOM-ENEA sulla Fusione, Frascati, Roma, ITALY

0322 **ITER Coil Power Supply**
A. Roshal, B. Bareyt, I. Benfatto, E. Bertolini, J. M. Bottereau, S. Bulgakov, N. Daniel, D. Hrabal, M. Huart, M. Matsukawa, P. L. Mondino, V. Kuchinski, A. Maschio, N. Mikhailov, A. Nerem and C. Neumeyer
ITER Joint Central Team, Naka-gun, Ibaraki-ken, JAPAN

0323 **Tooling Concepts for ITER Tokamak Assembly and Remote Disassembly**
A. Oikawa, F. Puhn, J.-L. Helary, Z. Piec, N. Tachikawa, M. Friend, M. Acks and A. Basile
ITER Joint Central Team, San Diego JWS, La Jolla, CA, USA

0324 **Design Development of Shielding Blanket for Fusion Experimental Reactor**
K. Furuya, T. Kurasawa, T. Kuroda, T. Hashimoto, S. Sato, I. Togami, T. Hatano, T. Osaki, I. Kawaguchi and H. Takatsu
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0325 **A Coherent FM Laser Radar Based System for Metrology in ITER**
R. E. Barry, T. W. Burgess and M. M. Menon
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0326 **Neutral Beams for ITER**
R. S. Hemsworth, H. D. Feist, M. Hanada, B. Heinemann, T. Inoue, E. Kussel, A. Krylov, P. Lotte, K. Miyamoto, N. Miyamoto, D. Murdoch, A. Nagase, Y. Ohara, Y. Okumura, J. Pamela, A. Panasenkov, K. Shibata, M. Tanii and M. Watson
ITER Joint Central Team, Naka-gun, Ibaraki-ken, JAPAN

0327 **Gas and Power Flow in the ITER Neutral Beam Injectors**
M. Hanada, J. Bucalossi, R. S. Hemsworth, A. Krylov, J. Pamela and A. Panasenkov
ITER Joint Central Team, Naka-gun, Ibaraki-ken, JAPAN

0328 **Design of the ITER In-Port RF Launcher**
D. J. Taylor, J. L. Ping, D. W. Swain, P. M. Ryan and F. W. Baity
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0329 **Dust Removal System for Fusion Experimental Reactors**
M. Onozuka, Y. Ueda, K. Takahashi, Y. Oda, Y. Seki, S. Ueda and I. Aoki
Mitsubishi Heavy Industries, Ltd., Yokohama, JAPAN

0330 **Remote Welding and Cutting Techniques for Fusion Experimental Reactors**
M. Onozuka, Y. Oda, E. Nagaoka, K. Ue, T. Ishide and H. Kamei
Mitsubishi Heavy Industries, Ltd., Yokohama, JAPAN

0331 **Withdrawn**

0332 **Overview of ITER Remote Handling**
K. Shibanuma, R. Hager, M. Kondoh, A. Tesini, C. Holloway, T. Burgess and R. Haange
ITER Joint Central Team, Naka-machi, Naka-gun, JAPAN

0333 **Feasibility Study on Welding and Cutting Method for Thick Plate in Fusion Reactor**
T. Osaki, Y. Nakayama, T. Kobayashi, T. Yamada, H. Nagatani and M. Yamaguchi
Kawasaki Heavy Industries LTD, Koto-ku, Tokyo, JAPAN

0334 **Cost Estimate for ITER Central Instrumentation and Control**
S. Davis, G. Kolinchak, G. Oliaro, P. Roney and G. Schobert
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0335 **Application of a Calibrated Tokamak Transport Model to ITER Start-up Study and C-Mod Simulation**
J. Qiang, A. Levinson and C. Singer
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0336 **Tritium Test of Cryogenic Molecular Sieve Bed for He GDC Gas Cleanup by 60 SLM Test Loop**
M. Enoeda, Y. Kawamura and K. Okuno
Japan Atomic Energy Research Institute, Ibaraki-ken, JAPAN

0337 **Tritium Decontamination and Decommissioning Study of the JAERI Fuel Cleanup System**
L. Bartlein
Los Alamos National Laboratory, Los Alamos, NM, USA

0338 **Radiological Safety During Maintenance of the Primary Heat Transfer System of the ITER Plant**
S. Sandri and L. Di Pace
ENEA C.R., Frascati, Rome, ITALY

0339 **ITER Principal Safety Functions: Radiological Confinement, Heat Removal, and Shutdown**
S. J. Piet, H. -W. Bartels, C. W. Gordon, A. E. Poucet and L. N. Topilski
ITER Joint Central Team, San Diego JWS, La Jolla, CA, USA

0340 **Key Results in ITER Safety Analysis**
H. -W. Bartels, C. W. Gordon, D. Holland, S. J. Piet, A. E. Poucet and L. N. Topilski
ITER Joint Central Team, San Diego JWS, La Jolla, CA, USA

0341 **MELCOR Ex-Vessel LOCA Simulations for ITER**
M. J. Gaeta, B. J. Merrill, H. -W. Bartels and L. Topilski
Lockheed Idaho Technologies Company, Idaho Falls, ID, USA

0342 **Fusion Safety Experiments in JAERI**
T. Kunugi, K. Takase, M. Ogawa and Y. Seki
Japan Atomic Energy Research Institute, Ibaraki-ken, JAPAN

0343 **Experimental Study of Buoyancy-Driven Exchange Flow From Breaches Under LOVA Condition**
K. Takase, T. Kunugi, M. Ogawa and Y. Seki
Japan Atomic Energy Research Institute, Ibaraki-ken, JAPAN

0344 **Parametric Analysis of an In-vessel LOCA for the ITER Plant**
R. Caporali, G. Caruso, G. Franzoni and M. T. Porfiri
ENEA C.R., Frascati, Rome, ITALY

0345 **Radiation Transport and Nuclear Induced Heating Analysis for ITER Baseline Design**
D. G. Cepraga, G. Cambi, G. C. Panini and M. Frisoni
ENEA, Dipartimento Innovazione, Bologna, ITALY

0346 **Environment Source Terms for In-Vessel and Ex-Vessel LOCA Accident Sequences in ITER**
G. Cambi, D. G. Cepraga, L. Di Pace and M. T. Porfiri
Bologna University, Physics Department, Bologna, ITALY

0347 **Activated Corrosion Products in ITER First Wall and Shielding Blanket Heat Transfer System Baseline Design**
L. Di Pace, G. Cambi, D. G. Cepraga, E. Sobrero and M. Costa
Frascati, Rome, ITALY

0348 **On the Risk Based Limits for ITER**
R. Golinescu and M. S. Kazimi
Massachusetts Institute of Technology, Cambridge, MA, USA

0349 **Welding and Cutting Characteristics of Blanket/First Wall Module to Back Plate for Fusion Experimental Reactor**
T. Kuroda, K. Furuya, S. Sato, T. Kurasawa, T. Hatano, I. Togami, T. Osaki, S. Koga, S. Sato and H. Takastu
Japan Atomic Energy Research Institute, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0350 **Plasma Position and Shape Control for ITER**
A. Portone, R. Albanese, D. Ciscato, Y. Gribov, D. Humphreys, C. Kessel, P. L. Mondino, D. Pearlstein and D. Ward
ITER Joint Central Team, Naka-gun, Ibaraki-ken, JAPAN

0351 **Analytical Modeling of the Friction Effects at the ITER TF/CS Interface**
V. Naumov, V. Palmov, A. Panin, Y. Krivchenkov and N. Mitchell
St. Petersburg State Technical University, St. Petersburg, RUSSIA

0352 **Construction Feasibility Study of the ITER EDA Cryostat**
Y. Cordier, J. P. Lafaille and W. D'haeseleer
Belgatom/Tractebel, Brussels, BELGIUM

0353 **The ITER Cryostat**
R. F. Bourque and M. E. P. Wykes
ITER Joint Central Team, Naka-gun, Ibaraki-ken, JAPAN

0354 **Ozone Hazard in the ITER Cryostat**
C. Rizzello, T. Pinna and M. T. Porfiri
ENEA C.R., Frascati, Rome, ITALY

0355 **Development of Cryogenic, Low Friction Surfaces for Application to ITER Structures**
R. Riddle, L. El-Marazki and R. Jayakumar
Lawrence Livermore National Laboratory, Livermore, CA, USA

0356 **Nuclear-Thermal Coupled Calculation of a Shielding Blanket for an Experimental Fusion Reactor**
Y. Seki, S. Sugaya and H. Kawasaki
Japan Atomic Energy Research, Ibaraki-ken, JAPAN

0357 **A Digital Long-Pulse Integrator**
J. D. Broesch
General Atomics, San Diego, CA, USA

0358 **Activation Analysis for ITER Design Options**
H. Attaya
Argonne National Laboratory, Argonne, IL, USA

0359 **The Development of High Heat Flux Components for ITER at ENEA**
E. Di Pietro, A. Pizzuto, A. Orsini, B. Riccardi, E. Visca, G. Ceccotti, M. Roccella, F. Lucca, G. Celata, G. Dell'Orco and C. Alessandrini
Associazione Euratom-ENEA sulla Fusione, Frascati, Rome, ITALY

0360 **An In-Vessel Inspection System for Next Step Fusion Machines**
T. V. Businaro
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

0361 **Magnetic Diagnostics For Future Tokamaks**
T. R. Hodapp, J. D. Broesch, J. A. Leuer, R. T. Snider and E. J. Strait
General Atomics, San Diego, CA, USA

0362 **Study of the Distribution System for the ITER Pulsed Power Supplies Scheme**
T. Bonicelli, I. Benfatto, D. Hrabal, M. Huart, A. Illescas, V. Macho, A. Roshal and G. Schlegel
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

Tuesday afternoon, 3 October 1995
1:15 - 1:45 pm – Champaign-Krannert-Urbana Rooms

Invited Posters

0456 **A Plan for IFE Development and the NIF's Role in It**
B. G. Logan and R. O. Bangerter
Lawrence Livermore National Laboratory, Livermore, CA, USA

0457 **IFMIF Test Cell Design Issues**
J. R. Haines, S. J. Zinkle, D. M. Williams and I. Gomes
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0458 **International Fusion Materials Irradiation Facility (IFMIF) Accelerator System Conceptual Design Activity**
R. A. Jameson, V. A. Teplyakov, D. Berwald, J. Rathke, H. Klein, M. Olivier and M. Sugimoto
Los Alamos National Laboratory, Los Alamos, NM, USA

0459 **Targets for IFE**
L. Foreman
Los Alamos National Laboratory, Los Alamos, NM, USA

0460 **Passive Cyclotron Current Drive for Fusion Plasmas**
W. Kernbichler
Institut für Theoretische Physik, Technische Universität Graz, Graz, AUSTRIA

Tuesday afternoon, 3 October 1995
1:30 - 2:15 pm – University Hall

Session Chair: A. Donato, *ENEA*

1:30 1400 Plenary Speaker
Tokamak Advances--Status and Role of TPX
K. Thomassen
Lawrence Livermore National Laboratory, Livermore, CA, USA

2:15 - 2:40 **Break**

Oral Session A – TPX Status
2:40 - 5:00 pm – Zuppke-Brundage Room

Session Chairs: K. Thomassen, *PPPL*, and B. Hong, *KAERI*

2:40 1401 **Tokamak Physics Experiment (TPX) Design**
J. A. Schmidt for the TPX Design Team
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

3:10 1402 **Use of Titanium in the Tokomak Physics Experiment (TPX)**
J. W. Davis, R. A. Causey, D. F. Cowgill and J. H. DeVan, P. Heitzenroeder
McDonnell Douglas Aerospace, St. Louis, MO, USA

3:30 1403 **Engineering Design Aspects of the TPX Diagnostic Set**
G. Gettelfinger, P. Edmonds, R. Ellis, S. Medley and G. Renda
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

4:00 1404 **TPX Divertor Design**
P. M. Anderson
General Atomics, San Diego, CA, USA

4:30 1405 **An Overview of the TPX Vacuum Vessel Preliminary Design**
R. E. Rocco
Raytheon Engineers and Constructors, Princeton, NJ, USA

Tuesday afternoon, 3 October 1995

Oral Session B – ITER First Wall/Blanket
2:40 - 5:00 pm – Illiniwek-Grange Room

Session Chairs: T. Shannon, *U Tenn*, and R. Bolton, *TdeV*

2:40 2401 **Selection of Plasma Facing Materials for ITER**
M. Ulrickson, M. Akiba, V. Barabash, S. Chiocchio, G. Federici, R. Matera, I. Mazul, G. Vieider and C. Wu
Sandia National Laboratories, Albuquerque, NM, USA

3:10 2402 **The Blanket and Divertor Maintenance Concept for ITER**
E. Tada, K. Ioki, G. Janeschitz, D. Maisonnier and E. Martin
Reactor Structure Lab, JAERI, Naka-machi, Ibaraki-ken, JAPAN

3:30 2403 **Thermal and Mechanical Behavior of the First Wall in Fusion Reactor**
G. Li and B. G. Thomas
University of Illinois at Urbana-Champaign, Urbana, IL, USA

4:00 2404 **ITER Breeding Blanket Design**
Y. Gohar, M. Billone, A. Cardella, W. Dänner, K. Ioki, T. Kuroda, D. Lousteau, P. Lorenzetto, S. Majumdar, R. Mattas, K. Mohri, R. Raffray, Y. Strebkov, H. Takatsu and E. Zolti
ITER Joint Central Team, Garching, GERMANY

4:30 2405 **Preliminary Assessment of the Tritium Inventory and Permeation in the PFCs of ITER**
G. Federici, T. Dolan, D. Holland, R. Causey and G. Longhurst
ITER Joint Central Team, Garching, GERMANY

Tuesday afternoon, 3 October 1995
2:00 - 5:00 pm – Exhibit Hall, Midwest Ballroom

Poster Session – Toroidal Reactors; IFMIF

Session Chairs: F. Najmabadi, UCSD, and R. Bourque, ITER

0401 **Design of the AC Power Systems for SST-1**
A. Varadharajulu, J.P. Gaur and SST Team
Institute for Plasma Research, Bhat, Gandhinagar, INDIA

0402 **Superconducting CICC for SST-1 Tokamak Magnets**
S. Pradhan, Y. C. Saxena and SST Team
Institute for Plasma Research, Bhat, Gandhinagar, INDIA

0403 **Magnet System for SST-1 Tokamak**
V. Bedakihale, R. Behl, S. Bhattacharjee, D. Chandra, S. Chaturvedi, R. Kalra, S. Pradhan, Y. C. Saxena, R. Srinivasan and SST Team
Institute for Plasma Research, Bhat, Gandhinagar, INDIA

0404 **The New FTU Control System, as the Result of the Technological and Functional Evolution in the Frascati Energy Research Center**
M. Panella, A. Bertocchi, G. Buceti, V. Bozzolan, C. Centioli, A. Imparato, G. Mazza, C. Torelli and E. Vitale
ENEA C.R., Frascati, Roma, ITALY

0405 **Time-resolved Measurements of Thermal Loads on the FTU Limiter**
G. Franzoni and R. Zanino
Politecnico di Torino, Torino, ITALY

0406 **Brazed Ceramic Window for Ion Bernstein Wave Heating**
R. D. Daugert, H. E. Evans, S. Z. Jurczynski, S. Bernabei and R. W. Walls
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0407 **ITER Vacuum Vessel Structural Analysis**
B. W. Riemer, D. Conner, B. Nelson, R. Sayer and D. Strickler
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0408 **A Rotating and Radially Sapping Electrical Double Probe for TEXTOR**
A. Cosler, K. Höthker, E. Kemmereit, M. Schürer, W. Bieger and W. Heuser
Institut Für Plasmaphysik, Forschungszentrum, Jülich, GERMANY

0409 **The General Assembly of HT-7 Superconducting Tokamak**
D. M. Gao, J. M. Li, S. R. Wang, X. Liu, W. H. Zhu, Y. H. Xue, J. F. Wu, X. F. Xu, Z. G. Liu and H. Wu
Institute of Plasma Physics, Academia Sinica, Hefei, Anhui, P. R. CHINA

0410 **Structure, Properties and Performance of Plasma-Sprayed Beryllium for Fusion Applications**
R. G. Castro, P. W. Stanek, K. E. Elliott, A. D. Bartlett, T. T. Taylor, D. L. Youchiuson, R. D. Watson and D. S. Walsh
Los Alamos National Laboratory, Los Alamos, NM, USA

0411 **Baking of the Vacuum Vessel Prototype of the Spanish Stellarator with a Control System Based on Neural Network**
J. Botija, L. Pacios, J. Alonso, M. Blaumoser, A. de la Peña, R. Carrasco, A. García, I. Labrador, I. Lapayese and M. Medrano
Asociación EURATOM/CIEMAT, Madrid, SPAIN

0412 **Engineering, Fabrication, Tests and Status of The Spanish Stellarator TJ-II**
M. Blaumoser and TJ-II Team
Asociación EURATOM/CIEMAT, Madrid, SPAIN

0413 **Power Supply System of the TJ-II Spanish Stellarator, Design, Construction and Tests**
A. Perez, B. Alberdi, J.-M. Del Rio, C. Lucia, L. Almoguera, M. Blaumoser, I. Kirpitchev, P. Mendez
JEMA SA, Lasarte-Oria, SPAIN

0414 **Current Ripple in the Coils of the TJ-II Spanish Stellarator**
A. Perez, J. Acero, B. Alberdi, J.-M. Del Rio, L. Almoguera, M. Blaumoser, I. Kirpitchev and P. Mendez
JEMA SA, Lasarte-Oria, SPAIN

0415 **A Versatile Timing System Based on OS-9 for the Spanish Stellarator TJ-II**
L. Pacios, A. de la Peña, R. Carrasco, I. Labrador and F. Lapayese
Asociación EURATOM/CIEMAT, Madrid, SPAIN

0416 **Development of Steady State ICRF Heating for Large Helical Device**
T. Mutoh, R. Kumazawa, T. Seki, F. Simpo, S. Masuda, T. Ido and T. Watari
National Institute for Fusion Science, Nagoya, JAPAN

0417 **Negative-Ion-Based Neutral Beam Injector for Large Helical Device**
O. Kaneko, Y. Oka, Y.Takeiri, K. Tsumori, R. Akiyama, E. Asano, T. Kawamoto, A. Ando and T. Kuroda
National Institute for Fusion Science, Toki, Gifu, JAPAN

0418 **Neutronics Analysis for the Stellarator Power Plant Study**
L. A. El-Guebaly
University of Wisconsin, Madison, WI, USA

0419 **Simplified Magnetic Circuit for the Calculation of the Stray Magnetic Flux Through the Gaps**
P. Collarin
EURATOM-ENEA, CNR, Padova, ITALY

0420 **The Short-Circuiting System for One Poloidal Gap of the RFX Shell**
P. Sonato, P. Zaccaria and G. Zollino
EURATOM-ENEA, CNR, Padova, ITALY

0421 **Passive and Active Control of the Field Errors at the Poloidal Gaps of the RFX Shell**
P. Fiorentin, E. Gaio, G. Marchiori, R. Piovan and V. Toigo
EURATOM-ENEA, CNR, Padova, ITALY

0422 **Study of the Damage Produced by High Velocity Pellets on Graphite First Wall Elements of RFX**
A. Reggiori, S. Martini, W. Baker, R. Carlevaro, G. Riva and G. B. Daminelli
CNPM-CNR, Peschiera B., Milano, ITALY

0423 **Methods for Field Error Analysis in the Magnetic Configuration of RFX**
F. Bellina, G. Chitarin, N. Pomaro and F. Trevisan
EURATOM-ENEA, CNR, Padova, ITALY

0424 **3D Numerical Simulation of Strong Evaporation and Condensation from Plasma-Facing Materials**
T. Kunugi, S. Wada
Japan Atomic Energy Research Institute, Naka-gun, Ibaraki-ken, JAPAN

0425 **Features of the Safety Analysis Performed for the IGNITOR Machine**
A. Carpignano, G. Franzoni and M. T. Porfiri
DENER, Politecnico Torino, Torino, ITALY

0426 **Safety Analysis of Plasma Anomaly Consequences in Fusion Reactors**
T. Honda, T. Okazaki, Y. Seki, T. Kunugi and I. Aoki
Hitachi Research Laboratory/Hitachi, Ltd., Hitachi-shi, Ibaraki-ken, JAPAN

0427 **Simple Aerosol Modelling for Fusion Power Plant Containments**
W. E. Han
UKAEA Government Division, Fusion, Culham Laboratory, Abingdon, Oxfordshire, UNITED KINGDOM

0428 **Gamma Radiation Fields Around the Cooling Circuits of the SEAFP Plant Model 1**
C. B. A. Forty
UKAEA Government Division, Fusion, Culham Laboratory, Abingdon, Oxon, UNITED KINGDOM

0429 **Fusion Safety Data Base**
I. Aoki and Y. Seki
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0430 **Feasibility of the Shield Energy Storage Concept**
M. Z. Hasan
Saga University, Saga, JAPAN

0431 **Estimation on Interfacial Mechanical Strength in the Bonded Structure for High Heat Flux Component**
K. Ohsemochi, K. Kitamura and J. Ohmori
Heavy Apparatus Engineering Laboratory, Toshiba Corporation, Yokohama, JAPAN

0432 **Evaluation of Nb-Base Alloys for Divertor Structure in Fusion Reactors**
I. M. Purdy and J. A. Todd
Argonne National Laboratory, Argonne, IL, USA

0433 **Current Drive Goals for Steady State Tokamak Power Plants**
D. Ehst
Argonne National Laboratory, Argonne, IL, USA

0434 **Characterics tics of the US Demo-1 Divertor**
G. T. Sager, C. P. C. Wong and ARIES Design Team
General Atomics, San Diego, CA, USA

0435 **Fusion Reactor Control**
D. A. Plummer
Dirk Arnold Plummer, P. E., Sea Bright, NJ, USA

0436 **DEMO Reactor Design Based on Inductively-operated Tokamak Plasmas**
Y. Ogawa, N. Inoue, K. Okano, J. F. Wang and T. Yamamoto
University of Tokyo, Tokyo, JAPAN

0437 **Plasma System Requirements and Performance Data Base for the Starlite/Demo Fusion Power Plant**
T. K. Mau, D. A. Ehst, S. C. Jardin, C. E. Kessel and B. J. Lee
University of California - San Diego, La Jolla, CA, USA

0438 **Assessment of the Ignitor Experiment and Construction of Its Key Components**
B. Coppi and the Ignitor Project Group
Massachusetts Institute of Technology, Cambridge, MA, USA

0439 **Breeding Potential of Candidate Breeders for the U.S. Demo Plant**
L. A. El-Guebaly
University of Wisconsin Madison, WI, USA

0440 **Preliminary Fabrication of Small Li_2O Spheres by Sol-Gel Method**
K. Tsuchiya, H. Kawamura, R. Oyamada, K. Nishimura, H. Yoshimuta and K. Watarumi
Oarai Research Establishment, JAERI, Ibaraki, JAPAN

0441 **On the Plasma-Focus-Produced Spheromak for the D-^{3}He-Fusion-Based Jet Propulsion**
A. B. Kukushkin and V.A. Rantsev-Kartinov
Institute for Nuclear Fusion RRC, Kurchatov Institute, Moscow, RUSSIA

0442 **Cyclotron Radiation Transport in D-^{3}He Fusion Toroidal Systems**
A. B. Kukushkin and L. K. Kuznetsova
Institute for Nuclear Fusion RRC, Kurchatov Institute, Moscow, RUSSIA

0443 **Engineering Options for the US Fusion Demo**
M. S. Tillack, D. K. Sze, C. P. C. Wong, L. El-Guebaly, L. Bromberg, L. Waganer and the ARIES Team
University of California - San Diego, La Jolla, CA, USA

0444 **Heat Flux Limits on the Plasma-Facing Components of a Commerical Fusion Power Plant**
X. R. Wang, D. K. Sze and M. S. Tillack
University of California - San Diego, La Jolla, CA, USA

0445 **An Experimental Modeling of the Fuel Cycle in Tokamaks**
G. L. Saksagansky, E. L. Koira, V. N. Lobanov and A. I. Vedeneev
D.V. Efremov Institute, St. Petersburg, RUSSIA

0446 **Error Field Analysis of Steady State Tokamak Reactor with Ferromagnetic (F82H) Blanket**
S. Takeji, T. Itoh, S. Jitsukawa, M. Kikuchi, H. Kishimoto, M. Kuriyama, M. Mori and H. Ninomiya
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0447 **Fusion for Desalination**
M. Ragheb
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0448 **Evolution of the ARIES-I Design in the ARIES and PULSAR Projects**
C. G. Bathke, R. L. Miller and the ARIES Research Team
Los Alamos National Laboratory, Los Alamos, NM, USA

0449 **Design and Analysis of the Lithium Target System for the IFMIF**
D. L. Smith, T. Hua, A. Hassanein and I. Gomes
Argonne National Laboratory, Argonne, IL, USA

0450 **Influence of the Deuteron Energy on the Testing Volume of IFMIF and its Impact on other Parameters**
I. C. Gomes and D. L. Smith
Argonne National Laboratory, Argonne, IL, USA

0451 **Engineering Trade Studies for the IFMIF Accelerator**
D. Berwald, S. Mendelsohn, T. Myers, C. Paulson, M. Peacock, C. Piaszczyk, J. Rathke, A. Todd, R. Jameson and E. Piechowiak
Northrop Grumman Corporation, Bethpage, NY, USA

0452 **Measurements of the Electrical and Optical Characteristic of Dielectrics in Fusion Use under Irradiation**
V. M. Chernov, G. L. Khorasanov, O. A. Plaksin, V. A. Stepanov, A. V. Vizgalov, V. A. Zherebtsov and A. V. Zrodnikov
Institute of Physics and Power Engineering, Obninsk, Kaluga Region, RUSSIA

0453 **The IFMIF Lithium System Design**
L. Green, D. Berwald and D. Smith
Westinghouse Science and Technology Center, Pittsburgh, PA, USA

0454 **A Steady State Field-Reversed Configuration with Rotating Magnetic Field**
M. Ohnishi, Y. Yamamoto, K. Yoshikawa and A. Ishida
Institute of Atomic Energy, Kyoto University, Kyoto, JAPAN

0455 **Design, Construction, and First Operational Results of a 5 Megawatt Feedback Controlled Amplifier System for Disruption Control on the Columbia University HBT-EP Tokamak**
W. A. Reass, R. R. Bartsch, G. A. Wurden, T. H. Ivers and D. L. Nadle
Los Alamos National Laboratory, Los Alamos, NM, USA

0461 **X-Ray Diagnostic for a Staged Z-Pinch**
B. Moosman, V. Bystritskii and F. J. Wessel
University of California, Irvine, CA, USA

0462 **Dense Plasma Focus for D–^{3}He Burning**
C. K. Choi, L. T. Cox and G. T. Nakafuji
Purdue University, West Lafayette, IN, USA

Wednesday morning, 4 October 1995
8:30 - 9:15 am – University Hall

Session Chair: C. B. Baxi, GA

8:30 1500 Plenary Session
The TFTR D-T Experience
M. Williams and the TFTR Group
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

9:15 - 9:40 **Break**

Oral Session A – Starlite and Demo
9:40 am - 12:00 n – Zuppke-Brundage Room

Session Chairs: O. Motojima, *NIFS*, and R. A. Krakowski, *LANL*

9:40 1501 **A Preliminary Systems Assessment of the Starlite DEMO Candidates**
C. G. Bathke and the Starlite Research Team
Los Alamos National Laboratory, Los Alamos, NM, USA

10:10 1502 **Evaluation of U. S. Demo-1 Helium-Cooled Blanket Options**
C. P. C. Wong, B. W. McQuillan, R. W. Schleicher, E. T. Cheng and the Demo Team
General Atomics, San Diego, CA, USA

10:30 1503 **The Starlite Project: The Mission of the Fusion Demo and Preliminary Assessment of Demo Candidates**
F. Najmabadi, L. Waganer and the ARIES Team
University of California, San Diego, CA, USA

11:00 1504 **Starlite Economics: Requirements and Methods**
R. L. Miller and the ARIES Team
University of California - San Diego, La Jolla, CA, USA

11:30 1505 **What Must Demo Do?**
L. Waganer
McDonnell Douglas Aerospace, St. Louis, MO, USA

12:00 - 1:30 **Lunch** (on your own)

Wednesday morning, 4 October 1995

Oral Session B – Alternate Confinement
9:40 am - 12:00 n – Illiniwek-Grange Room

Session Chair: M. Blaumoser, *CIEMAT*

9:40 2501 **The Engineering Development Program of RFX**
A. Maschio
ENEA - CNR, Università di Padova, Padova, ITALY

10:10 2502 **Improvement of RFX Performances by Field and Impurity Control**
A. Buffa and F. Gnesotto
ENEA - CNR, Università di Padova, Padova, ITALY

10:30 2503 **Recent Advances in Stellarator Development**
J. F. Lyon
Oak Ridge National Laboratory, Oak Ridge, TN, USA

11:00 2504 **Beam Driven Field Reversed Configurations**
R. Sudan
Cornell University, Ithaca, NY, USA

11:30 2505 **Recent Advances in FRC Physics**
L. C. Steinhauer
University of Washington, Redmond, WA, USA

12:00 - 1:30 **Lunch** (on your own)

Wednesday morning, 4 October 1995
9:00 am - 12:30 pm – Exhibit Hall, Midwest Ballroom

Poster Session – TPX; Magnets; Heating; Diagnostics

Session Chair: A. Nagy, *PPPL*, and M. Hasan, *Saga U.*

0501 **TPX Power Supply Design and Performance**
E. Lu, G. Bronner, S. Ramakrishnan and C. Neumeyer
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0502 **Quench Protection Circuits for Superconducting Magnets**
C. Neumeyer, G. Bronner, E. Lu and S. Ramakrishnan
Raytheon Engineers and Constructors, Princeton, NJ, USA

0503 **Divertor Erosion Study for TPX and Implications for Steady State Fusion Reactors**
J. N. Brooks
Argonne National Laboratory, Argonne, IL, USA

0504 **Thermal Hydraulic Analysis of the TPX Plasma Facing Components**
C. B. Baxi, E. E. Reis, K. Redler, E. Chin, R. Boonstra, K. M. Schaubel, P. A. Anderson and E. Hoffmann
General Atomics, San Diego, CA, USA

0505 **Elastic-Plastic-Creep Analyses of Brazed Carbon-Carbon/OFHC Divertor Tile Concepts for TPX**
E. Chin and E. E. Reis
General Atomics, San Diego, CA, USA

0506 **Thermal and Structural Analysis of the TPX Divertor**
E. E. Reis, C. B. Baxi, E. Chin and K. M. Redler
General Atomics, San Diego, CA, USA

0507 **Design of the Inboard Passive Stabilizer for TPX**
E. Hoffmann, C. B. Baxi, J. Bialek, E. Chin, K. Redler and E. E. Reis
General Atomics, San Diego, CA, USA

0508 **Use of a Thermal Analogy to Find Electrical Resistances of the Electrical Breaks in the TPX Passive Stabilization Systems**
K. M. Redler, C. B. Baxi, E. Chin, E. H. Hoffmann, E. E. Reis and K. M. Schaubel
General Atomics, San Diego, CA, USA

0509 **Design of the TPX Outboard Toroidal Limiters**
K. M. Schaubel, P. M. Anderson, C. B. Baxi, R. H. Boonstra, B. E. Eklund, R. Pearsons, J. L. Pickering, K. M. Redler, E. E. Reis and D. L. Sevier
General Atomics, San Diego, CA, USA

0510 **TPX Vacuum Vessel Design**
J. Warren, R. E. Rocco and G. Wille
Raytheon Engineers and Constructors, Inc., Princeton, NJ, USA

0511 **Fluid-Structural Interaction Analysis of the TPX Vacuum Vessel**
S. Dinkevich, T. Feng, Y. Feldshteyn, D. Majumder
Raytheon Engineers and Constructors, Princeton, NJ, USA

0512 **TPX Vaccum Vessel Transient Thermal and Stress Conditions**
Y. Feldshteyn, S. Dinkevich and T. Feng
Ratheon Engineers and Constructors, Inc., Princeton, NJ, USA

0513 **An Analytic Model for Pumping the Divertor Region of TPX**
D. R. Juliano, D. N. Ruzic and P. C. Smith
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0514 **The Effects of a Tilted Strike Plate Geometry on the TPX Divertor Region**
P. F. Cheng, D. R. Juliano, D. N. Ruzic and M. Rensink
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0515 **Vacuum Pumping System for TPX**
K. D. St. Onge
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0516 **The Worst Electromagnetic Loads on the Coils of the TPX**
A. L. Radovinsky, R. D. Pillsbury, Jr. and J. H. Schultz
MIT Plasma Fusion Center, Cambridge, MA, USA

0517 **TPX Construction Management**
D. Knutson
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0518 **TPX Heating and Cooling System**
D. J. Kungl and D. S. Knutson
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0519 **TPX Neutronics and Shielding Analyses**
S. L. Liew and L. P. Ku
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0520 **Impact of PF and TF Coil Misalignment on m=2, n=1 Plasma Error Fields in TPX**
J. A. Leuer and J. L. Luxon
General Atomics, San Diego, CA, USA

0521 **Stresses, Slippage and Acceptance Criteria for the Toroidal Field Coil Insulation System in TPX**
R. L. Myatt
Stone & Webster Engineering Corporation, Cambridge, MA, USA

0522 **Ramp-rate Limitation Experiments and Analysis in Support of the TPX Magnets**
J. H. Schultz, J. Chen, M. Ferri, J. Freidberg, C. Gung, S. Jeong, R. Pillsbury, Jr., D. Reisner, A. Shajii, S. Smith, P. Wang, M. Chaplin, N. Martovetsky, V. Vysotsky and W. Warnes
MIT Plasma Fusion Center, Cambridge, MA, USA

0523 **Design of the TPX Quench Detection System**
J. H. Schultz, N. Diatchenko, R. Pillsbury, Jr., S. Pourrahimi, S. Smith, P. Wang, M. Chaplin, N. Martovetsky and J. Citrolo
MIT Plasma Fusion Center, Cambridge, MA, USA

0524 **The Electrical Testing Program in Support of the TPX Magnet Design**
J. H. Schultz, W. Beck, M. Gwinn, F. Roach, J. Hillenbrand and P. Sanger
MIT Plasma Fusion Center, Cambridge, MA, USA

0525 **Numerical Modeling of the Voltage Sensors for Quench Detection in the TPX TF and PF Conductors**
P.-W. Wang, J. H. Schultz and R. D. Pillsbury, Jr.
MIT Plasma Fusion Center, Cambridge, MA, USA

0526 **Magnetic Aspects of the Passive Stabilizing Structure in TPX**
J. Bialek and G. H. Neilson
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0527 **Preliminary Design Overview of the Superconducting TPX Poloidal Field Magnet System**
R. Parman, H. Calvin, O. Christiansen, J. Cizek, A. Corpuz, W. Hannan, J. Hillenbrand, M. Krefta, T. Kupisewski, G. Lowry, M. LaJeunesse, P. McAuliffe, D. Potter, F. Roach, P. Sanger, S. Singh, A. Burger, S. Kalsi, I. Clarkson, T. Schultheiss, G. Naumovich and D. Hartman
Westinghouse Electric Corporation, Sunnyvale, CA, USA

0528 **A 3 Megawatt Lower Hybrid Generator for TPX**
N. Greenough, S. Bernabei and D. Swain
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0529 **Electromagnetic Loads on Ion Cyclotron and Lower Hybrid Launchers for TPX**
J. J. Yugo, C. H. Fogelman, P. L. Goranson, D. L. Conner, D. W. Swain and R. O. Sayer
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0530 **LH System Design for TPX**
P. L. Goranson, D. L. Conner, D. W. Swain, J. J. Yugo, S. Bernabei and N. Greenough
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0531 **Design of the ICRH Antenna for TPX**
C. H. Fogelman, D. W. Swain, P. M. Ryan and J. J. Yugo
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0532 **Remotely-Operated Tube Cutters for TPX**
R. N. Junge, C. Dahms and G. W. Silke
General Atomics, San Diego, CA, USA

0533 **Remote Welding Equipment for TPX**
G. W. Silke and R. N. Junge
General Atomics, San Diego, CA, USA

0534 **TPX In-Vessel Remote Maintenance Tooling**
M. J. Rennich and G. W. Silke
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0535 **Copper Alloy Candidates and Design Considerations for the Heat Sink Structure of Plasma Facing Components in TPX**
P. W. Trester, K. M. Schaubel, E. H. Hoffmann, P. M. Anderson and E. E. Reis
General Atomics, San Diego, CA, USA

0536 **Corrosion Studies of Titanium in Borated Water for TPX**
D. F. Wilson, S. J. Pawel, J. H. DeVan, M. J. Cole and B. E. Nelson
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0537 **TPX Superconducting Cable-in-Conduit 1995 – Design and Development Progress**
J. P. Zbasnik, N. N. Martovetsky, S. M. Hibbs, J. H. Schultz, R. D. Pillsbury, Jr. and J. C. Citrolo
Lawrence Livermore National Laboratory, Livermore, CA, USA

0538 **The Cryogenic Helium Cooling System for the Tokamak Physics Experiment**
B. Felker and D. S. Slack
Lawrence Livermore National Laboratory, Livermore, CA, USA

0539 **TPX Superconducting Tokamak Magnet System – 1995 Design and R & D Status Overview**
G. A. Deis, D. D. Lang, M. C. Jackson, N. N. Martovetsky, L. R. Pedrotti, J. P. Zbasnik; J. H. Schultz, R. D. Pillsbury, Jr., and MIT Team; J. C. Citrolo, C. M. Weber, T. A. Antaya, and Babcock and Wilcox Team; R. K. Parman, D. R. Potter, P. A. Sanger and Westinghouse Electric Corporation Team
Lawrence Livermore National Laboratory, Livermore, CA, USA

0540 **Co-Wound Voltage Sensor R&D for TPX Magnets**
M. R. Chaplin, N. N. Martovetsky, J. P. Zbasnik, J. H. Schultz, S. Pourrahimi, S. P. Smith and P.-W. Wang
Lawrence Livermore National Laboratory, Livermore, CA, USA

0541 **Local I&C for the TPX PF & TF Magnets**
M. R. Chaplin, N. N. Martovetsky, J. P. Zbasnik, J. H. Schultz, S. Pourrahimi, S. P. Smith and P.-W. Wang
Lawrence Livermore National Laboratory, Livermore, CA, USA

0542 **Converter Control Strategies for Reactive Power Reduction and Compensation in ITER**
R. Piovan, E. Gaio, V. Toigo and I. Benfatto
EU ITER Home Team, Padova, ITALY

0543 **The ITER Poloidal Field Configuration and Operation Scenario**
Y. Gribov, R. Albanese, P. Barabaschi, I. Benfatto, R. Bulmer, D. Ciscato, S. Jardin, C. Kessel, M. Matsukawa, P. L. Mondino, G. Pacher, A. Portone, I. Senda, T. Shoji and J. Wesley
ITER Joint Central Team, Naka JWS, Naka-gun, Ibaraki-ken, JAPAN

0544 **ITER Central Solenoid Model Coil**
M. M. Steeves, J. W. Wohlwend, P. R. Gertsch and D. Paganini
MIT Plasma Fusion Center, Cambridge, MA, USA

0545 **Energy Dissipation in CS Model Coil Joint During Normal Operation**
C. Y. Gung, M. Steeves and J. V. Minervini
MIT Plasma Fusion Center, Cambridge, MA, USA

0546 **Structural Analysis of the ITER EDA Magnet System**
P. H. Titus
Stone & Webster Engineering Corporation, Cambridge, MA, USA

0547 **Analysis of the Transition End Regions of the ITER Central Solenoid**
J. Stoner and F. Wong
ITER Joint Central Team, Naka JWS, Naka-gun, Ibaraki-ken, JAPAN

0548 **Heat Transfer Characteristics of Rectangular Coolant Channels with Various Aspect Ratios in the Plasma-Facing Components Under Fully Developed MHD Laminar Flow**
K. Takase and M. Z. Hasan
Japan Atomic Energy Research Institute, JAERI, Ibaraki-ken, JAPAN

0549 **Analysis of Heat Transfer and Erosion Effects on ITER Divertor PFCs Induced by Slow High-Power Transients**
G. Federici, R. Raffray, S. Chiocchio, J. Dietz, B. Esser, Y. Igitkhanov, G. Janeschitz and I. Smid
ITER Joint Central Team, Garching JWS, Garching, GERMANY

0550 **Power and Capacity Reduction Scheme for Tokamak Poloidal Field Power Supply Using Superconducting Coils**
K. Yokota, J. Kondoh and R. Shimada
Tokyo Institute of Technology, Tokyo, JAPAN

0551 **Computer Simulations of the Noise Injection Experiment**
P.-W. Wang, J. R. Hale, J. H. Schultz and R. D. Pillsbury, Jr.
MIT Plasma Fusion Center, Cambridge, MA, USA

0552 **A Fiberoptic Quench Detection System for Cable-in-Conduit Magnets**
S. P. Smith and S. Pourrahimi
MIT Plasma Fusion Center, Cambridge, MA, USA

0553 **Principles of Advanced Quench Detection Design in Cable-in-Conduit (CICC) Magnets**
J. H. Schultz, S. Pourrahimi, S. Smith, P. Wang, M. Chaplin and N. Martovetsky
MIT Plasma Fusion Center, Cambridge, MA, USA

0554 **Three Dimensional Stability and Quench in CICC**
M. A. Ferri, A. Shajii and J. P. Freidberg
MIT Plasma Fusion Center, Cambridge, MA, USA

0555 **Tokamak-15: Results, Problems, Plans**
P. P. Khvostenko, I. A. Posadsky and A. N. Vertiporokh
Nuclear Fusion Institute, RRC Kurchatov Institute, Moscow, RUSSIA

0556 **Ohmic Baking System Upgrade for Tokamak-15 Discharge Chamber**
V. N. Garnov, S. V. Kabanovsky, P. P. Khvostenko, V. A. Kochin, A. I. Nikonorov, P. N. Orlov, I. A. Posadsky and A. N. Vertiporokh
Nuclear Fusion Center, RRC Kurchatov Institute, Moscow, RUSSIA

0557 **Russian 110 GHz Gyrotron Control System**
J. C. Allen, R. W. Callis, W. P. Cary and R. O'Neill
General Atomics, San Diego, CA, USA

0558 **Withdrawn**

0559 **Plasma Disruption Force and Stress Analysis of a Folded Waveguide Launcher for PBX-M**
J. J. Yugo, D. L. Conner, C. H. Fogelman and T. S. Bigelow
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0560 **Mechanical Design of the Folded Waveguide for PBX-M and TFTR**
C. H. Fogelman, T. S. Bigelow, J. J. Yugo, D. L. Conner, D. J. Taylor, M. D. Carter, U. P. Lickliter, G. Barnes, H. Kugel and T. Kozub
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0561 **Interpretation of PISCES-A RF Antenna System Experimental Results with Circuit Simulation**
D. A. Rothweil, D. A. Phelps, R. Doerner and A. Nerem
General Atomics, San Diego, CA, USA

0562 **Tokamak Poloidal Magnetic Field Measurements Accurate for Unlimited Time Durations**
R. D. Woolley
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0563 **Gamma-Ray Diagnostics for Burning Plasmas**
K. W. Wenzel
MIT Plasma Fusion Center, Cambridge, MA, USA

0564 **Diamond Detectors for *in-situ* Measurements of Fusion Reactor Fast Neutron Spectra**
K. W. Wenzel and W. C. Fan
MIT Plasma Fusion Center, Cambridge, MA, USA

0565 **Innovative Technologies for Faraday Shield Cooling**
J. H. Rosenfeld, M. T. North and R. L. Goulding
Thermacore, Inc, Lancaster, PA, USA

Wednesday afternoon, 4 October 1995
1:15 - 1:45 pm – Krannert-Champaign-Urbana Room

Invited Posters

0661 **Fusion Plasma Research and Education in Japan**
N. Inoue
University of Tokyo, Tokyo, JAPAN

0662 **Advances in JT-60U Facilities and its Operation**
T. Kimura and the JT-60 Team
Japan Atomic Energy Research Institute, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0663 **ICRF Systems in the JET Pumped Divertor Configuration**
A. S. Kaye, V. Bhatnagar, M. Bures, P. Crawley, B. Fechner, J. Jacquinot, C. Gormezano, P. Lamalle, R. Lobel, J. Plancoulaine, E. Righi, F. Rimini, M. Schmid, A. Sibley, G. Sips, D. Start, M. Timms, B. Tubbing, T. Wade and R. Walton
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

0664 **TORE SUPRA: Status of Long Pulse Steady State Operation**
D. M. van Houtte
Association Euratom-CEA Centre d'Etudes de Cadarache, St. Paul lez Durance, FRANCE

Wednesday afternoon, 4 October 1995
1:30 - 2:15 pm - University Hall

Session Chair: I. A. Cook, UKAEA

1:30 1600 **Environmental Issues and Global Energy Economy Project**
J. Clarke
Pacific Northwest Laboratory

2:15 - 2:40 **Break**

Oral Session A – Fusion Economics/Neutron Sources, IFMIF
2:40 - 5:00 pm – Zuppke-Brundage Room

Session Chair: W. Kernbichler, *TUG*

2:40 1601 **Magnetic Fusion Reactor Economics**
R. A. Krakowski
Los Alamos National Laboratory, Los Alamos, NM, USA

3:10 1602 **Synergies and Conflicts Between Safety and Economic Objectives for Fusion: Implications for Fusion Development Strategies**
I. Cook, P. J. Knight and C. B. A. Forty
UKAEA Government Division, Abingdon, Oxon, UNITED KINGDOM

3:30 1603 **IEC Neutron Source Development and Applications**
R. A. Nebel, T. N. Tiouririne, D. C. Barnes, J. M. Finn and W. D. Nystrom
Los Alamos National Laboratory, Los Alamos, NM, USA

4:00 1604 **Exploration and Assessment of Design Windows for Tokamak-Based Volumetric Neutron Source**
S. K. Ho and M. A. Abdou
University of California at Los Angeles, Los Angeles, CA, USA

4:30 1605 **International Fusion Materials Irradiation Facility (IFMIF) Design Integration**
T. E. Shannon
University of Tennessee, Knoxville, TN, USA

Wednesday afternoon, 4 October 1995

Oral Session B – DIII-D; Disruptions
2:40 - 5:00 pm – Illiniwek-Grange Room

Session Chairs: G. J. Federici, ITER, and M. Ulrickson, SNL

2:40 2601 **Recent Results From the DIII-D Tokamak**
A. Kellman for the DIII-D Team
General Atomics, San Diego, CA, USA

3:10 2602 **Engineering Design of a Radiative Divertor for DIII-D**
J. P. Smith, C. B. Baxi, E. Chin, M. E. Hollerbach, R. N. Junge, E. E. Reis and D. L. Sevier
General Atomics, San Diego, CA, USA

3:30 2603 **Diagnostics for the DIII-D Radiative Divertor**
D. G. Nilson, N. H. Brooks, J. P. Smith and R. T. Snider
Lawrence Livermore National Laboratory, Livermore, CA, USA

4:00 2604 **Upgrade of the DIII-D RF System**
R. W. Callis, W. P. Cary, R. O'Neill, J. C. Allen, T. E. Harris, J. S. deGrassie, S. W. Ferguson, F. W. Baity, G. Barber, J. Tooker and D. A. Phelps
General Atomics, San Diego, CA, USA

4:30 2605 **Effect of Disruptions on Plasma-Facing Components**
J. G. Gilligan and M. A. Bourham
North Carolina State University, Raleigh, NC, USA

Wednesday afternoon, 4 October 1995
2:00 - 5:00 pm – Exhibit Hall, Midwest Ballroom

Poster Session – Tokamak Experiments

Session Chairs: M. Gasparrato, *ENEA Frascati*, and J. Luxon, *GA*

0601 **TFTR-MG Uprate, Analysis and Performance**
M. Awad, E. Baker, P. Bonanos, G. Bronner, A. Ilic, D. O'Neill and S. Ramakrishnan
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0602 **Model for TFTR Motor-Generator (MG)**
E. Lu, G. Bronner, A. Ilic, S. Ramakrishnan and C. Neumeyer
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0603 **Tokamak Fusion Test Reactor (TFTR) Power System Changes for Toroidal Field**
S. Ramakrishnan, D. Ashcroft, C. Ancher, H. Anderson, N. Fromm, M. Awad, E. Baker, G. Bronner, A. Ilic, E. Lu, C. Neumeyer, A. von Halle and R. Woolley
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0604 **TFTR Vacuum System Exhaust Pressure Control for D-T Operation**
J. G. Gioia, S. Raftopoulos, P. H. LaMarche, J. Montague, J. Collins, G. Cutsogeorge, J. Hosea and P. Ladd
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0605 **Operation of the Lithium Pellet Injector During D-T Operations on TFTR**
G. W. Barnes, R. C. Gernhardt and D. Mansfield
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0606 **Operation of a Fluorinert Cooling System for the Toroidal Field Coils on TFTR**
G. W. Barnes, R. Pysher, J. Chrzanowski and R. Woolley
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0607 **RF Arc Detection Using Harmonic Signals**
J. H. Rogers, P. LaRue, D. A. Phelps and R. I. Pinsker
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0608 **Beta Normal Limiting of TFTR Neutral Beams**
J. E. Lawson, M. G. Bell, R. J. Marsala and D. Mueller
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0609 **TFTR Neutral Beam Control and Monitoring for DT Operations**
T. O'Connor, J. Kamperschroer, J. Chu, G. Fleming, L. Grisham, L. Lagin, G. Kolinchak, B. McCormack, R. Newman, M. Oldaker, K. Silber, T. Stevenson, A. von Halle and K. Wright
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0610 **TFTR Neutral Beam D-T Gas Injection System – Operational Experiences of the First Two Years**
M. E. Oldaker, J. E. Lawson, T. N. Stevenson and J. H. Kamperschroer
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0611 **The TFTR 40 MW Neutral Beam Injection System and DT Operations**
T. Stevenson, V. Garzotto, L. Grisham, J. Kamperschroer, B. Mc Cormack, R. Newman, T. O'Connor, M. Oldaker, A. von Halle, K. Wright
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0612 **Refurbishing Tritium Contaminated Ion Sources**
K. E. Wright, R. H. Carnevale and B. E. McCormack
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0613 **Structural Analysis of TFTR TF Coils and Support Structure for 6 Tesla Operation**
G. Cargulia, L. Lontai and I. Zatz
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0614 **Closed Circuit Color Video System on the TFTR Machine**
G. Kolinchak and J. Wertenbaker
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0615 **Upgrade to the Multichannel Neutron Collimator**
A. L. Roquemore, S. von Goeler and L. C. Johnson
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0616 **Design Improvements and Lessons Learned for the TFTR Tritium Cleanup and Gas Holding Tank Sampling Systems**
M. Kalish, P. LaMarche, M. Viola, J. W. Anderson, L. Ciebiera, R. Rossmassler, T. Walters, S. Langish and M. Casey
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0617 **Tritiated Pump Oil Change Cart**
T. Kozub and L. Ciebiera
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0618 **Installation of the Tritium Purification System**
G. Labik, T. Golian, J. Satkofsky, P. Sichta, D. Crook, L. Dudek, G. Coward and R. Parsells
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0619 **Control of Tritium Transfer at TFTR**
R. Mika, B. Blanchard, R. Camp, J. Collins, J. Hosea, P. LaMarche, A. Nagy and J. Schobert
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0620 **Control Systems of the TFTR Tritium Purification System**
J. Montague, J. Satkofsky, J. Schobert, P. Sichta and D. Vorhees
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0621 **TFTR Tritium Accounting System for DT-Operation**
A. Nagy, P. Alling, E. Amarescu, D. Bashore, W. Blanchard, R. Camp, M. Corneliussen, M. Diesso, J. Dong, J. Hosea, G. Pearson, S. Raftopolous, R. Rossmassler, C. Saville, J. Schobert and D. Voorhees
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0622 **Control of TFTR During DT Operations**
G. G. Pearson, P. D. Alling, W. Blanchard, R. A. Camp, R. J. Hawryluk, J. C. Hosea and A. Nagy
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0623 **Integration of the Tritium Purification System (TPS) into TFTR Operations**
S. Raftopoulos, R. Scillia, P. Sichta, L. Dudek, G. Labik, J. Satkofsky, J. Langford, J. Robins, K. Woodall and T. Busigin
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0624 **TFTR Tritium Gas Chromatography System**
R. Rossmassler and T. Granger
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0625 **Application of the Tritium Remote Control and Monitoring System (TRECAMS) to TFTR's Tritium Inventory Management Program**
G. Schobert, D. Bashore, J. Dong and M. Diesso
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0626 **Operational Experience in the Recovery of Tritium from TFTR Plasma Exhaust Gases by Cryogenic Distillation**
R. J. Scillia, S. Raftopoulos, J. Langford and G. Labik
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0627 **The TFTR Plasma Exhaust Tank System**
M. E. Viola, M. Kalish, P. LaMarche, R. Daugert, C. A. Gentile and T. W. Walters
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0628 **Operating Experience with TFTR's Tritium Storage and Delivery System**
D. R. Voorhees
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0629 **A Process Heated Ion Chamber for DTO in Nitrogen**
R. T. Walters
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0630 **A Tritium Detector for the Tokamak Fusion Test Reactor**
R. Ellefson, M. Caorlin, D. Mueller, J. Gill
Ellefson Analytical Services, Princeton, NJ, USA

0631 **Simplified Fuel-Cycle Tritium Inventory Model For Systems Studies**
S. K. Ho and W. Kuan
University of California, Los Angeles, Fusion Engineering Group, Los Angeles, CA, USA

0632 **The Certification Process for Tritium Operators at TFTR**
C. A. Gentile, P. LaMarche, S. Murphy, S. Gordon and A. Contino
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0633 **DTO Waste Compliance Monitoring System at TFTR**
W. T. Shmayda, N. P. Kherani, T. Walters and R. Matsugu
Ontario Hydro Technologies, Toronto, Ontario, CANADA

0634 **Tritium Inventory in TFTR**
J. P. Kelly, L. A. Haynes and D. N. Ruzic
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0635 **The Design and Employment of a System to Vent and/or Pump Vacuum Spaces with Possible Tritium Contamination**
J. W. Collins, J. Hosea, J. Winston, T. Provost, R. Kokal, F. Simmonds Jr., J. DeSandro, V. Garzotta, M. Cropper, S. Raftopoulos, S. Vinson Jr. and P. LaMarche
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0636 **Health Physics and Radioactive Waste Considerations for the TFTR**
K. Rule, J. Gilbert, J. Scott, G. Ascione, R. Cislo, S. Elwood, R. Flournoy, S. Larson, R. Parsells, J. Stencel and C. Tilson
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0637 **Measurement and Calculation of TFTR D-T Doses in and around Test Cell Labyrinth Shielding**
A. Kumar, M. A. Abdou, J. Eggleston and H. W. Kugel
University of California - Los Angeles, Los Angeles, CA, USA

0638 **What You Don't Know Can Hurt! Reducing Hazardous Waste Liability Through the Prudent Use of Audits**
J. A. Malsbury, S. Missailidis and J. Scott
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0639 **Development and Operation of First Wall in JT-60U High-power Heated Discharges**
K. Masaki, K. Kodama, T. Arai, H. Hiratsuka, J. Yagyu, M. Saidoh, N. Ogiwara and S. Higashijima
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0640 **Development of Negative Ion Beam Accelerators for High Power Neutral Beam Systems**
K. Watanabe, N. Ebisawa, A. Honda, T. Inoue, M. Kazawa, K. Miyamoto, N. Miyamoto, K. Mogaki, A. Nagase, Y. Ohara, Y. Okumura, T. Takayasu, H. Usami and K. Usui
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0641 **Development of a Computer-Aided Software Engineering Tool for Sequential Control of Discharges in JT-60U**
M. Shimono, H. Akasaka, K. Kurihara and T. Kimura
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0642 **Conceptual Design of JT-60SU**
M. Kikuchi, K. Nagashima, T. Aoyagi, G. Kurita, K. Ushigusa, Y. Neyatani, T. Kubo, K. Tobita, K. Masaki, A. Kaminaga, N. Hosogane, A. Nagashima, N. Miya, N. Toyoshima, Y. Takahashi, T. Hayashi, M. Nagami, S. Nakagawa, K. Nakashima and M. Otsuka
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

0643 **PBX-M Vacuum Vessel Seal Upgrade**
T. Kozub, G. Barnes, J. Carson, J. Chrzanowski, L. Gereg, P. Heitzenroeder, H. Kugel, T. Meighan, T. Provost and J. Semler
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0644 **AC/DC Converters for the ITER Poloidal Field System**
I. Benfatto, S. Bulgakov, D. Hrabal, V. Kuchinski, A. Maschio, P. L. Mondino, A. Roshal, R. Piovan and S. Tenconi
ITER Joint Central Team, Naka-gun, Ibaraki-ken, JAPAN

0645 **Overview of the PBX-M Plasma Control System Upgrade**
R. E. Hatcher, R. Bell, J. Chu, J. Hirsch, T. Kozub, L. Lagin, M. Okabayashi and P. Sichta
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0646 **PBX-M Upgrade for Advanced Wall Stabilization and Profile Control Studies**
H. W. Kugel, T. Kozub, G. Barnes, S. Bernabei, J. Carson, J. Chrzanowski, L. Gereg, G. Gettelfinger , N. Greenough, R. Hatcher, R. J. Hawryluk, P. Heitzenroeder, R. Kaita, L. Lagin, T. Meighan, M. Okabayashi, M. Ono, T. Provost, J. Semler, P. Sichta, W. Tighe and J. R. Wilson
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0647 **Software Development for the PBX-M Plasma Control System**
L. Lagin, R. Bell, J. Chu, R. Hatcher, J. Hirsch, M. Okabayashi, P. Sichta, T. Fredian, S. Horn and J. Stillerman
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0648 **Computing Hardware for the PBX-M Plasma Control System**
P. Sichta, R. Bell, J. Chu, R. Hatcher, L. Lagin, J. Hirsch and M. Okabayashi
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0649 **Design and Stress Analysis of the Magnet System for the KT-2 Tokamak with Long-Pulse Operation Capabilities**
K. W. Lee, D. E. Kim, J. E. Milburn, S. R. In, B. J. Yoon, C.-K. Hwang and R. Andreani
Korea Atomic Energy Research Inst., Taejon, KOREA

0650 **Development of Operation Scenarios with High-Bootstrap, Negative Shear Configuration for Large-Aspect-Ratio Tokamak KT-2**
B. G. Hong, J. M. Han, M. H. Joo, K. W. Lee, S. K. Kim, S. Poedts and H. Goedbloed
Korea Atomic Energy Research Inst., Taejon, KOREA

0651 **Edge Plasma Transport Modeling for the Design of KT-2 Tokamak Poloidal Divertor**
K. Im, D.-K. Kim and S. H. Hong
Seoul National University, Seoul, KOREA

0652 **Halo Current Measurements on Alcator C-Mod**
J. Sorci, R. Granetz, I. Hutchinson, J. Irby, L. Myatt, B. Labombard, H. Becker and D. Gwinn
MIT Plasma Fusion Center, Cambridge, MA, USA

0653 **Nonlocal Heat Transport by Electromagnetic Waves in Fusion Systems**
A. B. Kukushkin
Institute for Nuclear Fusion RRC, Kurchatov Institute, Moscow, RUSSIA

0654 **Disruption Control by the m/n<2 Static Helical Magnetic Field**
F. Hong and Q. Yu
Heifu Union University, Hefei, P. R. China

0655 **Broadening of the Scrape-off-Layer by a Plasma Convection Induced by Toroidal Asymmetries of the Divertor Plates and the Gas-Puff**
R. H. Cohen and D. D. Ryutov
Lawrence Livermore National Laboratory, Livermore, CA, USA

0656 **New Designs and Transport Analysis of Divertors in Toroidal Confinement Systems**
S. Ido and M. Kashiwagi
Saitama University, Urawa, Saitama, JAPAN

0657 **Thermal/Mechanical Analysis of the ITER Divertor Vane**
B. W. Riemer and J. R. Haines
Oak Ridge National Laboratory, Oak Ridge, TN, USA

0658 **Multilayer Mirror-based Monitors for Impurity Controls in Large Fusion Reactor-type Devices**
S. P. Regan, M. J. May, M. Finkenthal and H. W. Moos
Johns Hopkins University, Baltimore, MD, USA

0659 **Divertor II for ASDEX-Upgrade**
B. Streibl, S. Deschka, K. Mattes, J. Perchermeier, H. Schneider, S. Schweizer and M. Weißgerber
Max-Planck-Institut fur Plasmaphysik, Garching, GERMANY

0660 **Technical Concept of the Dynamic Ergodic Divertor for TEXTOR**
B. Giesen
Jülich, GERMANY

0665 **The Manufacturing and Testing of the Toroidal Pumped Limiter Prototype Elements for TORE SUPRA**
L. Plöchl, J. Schlosser, J. P. Cocat, P. Chappuis, G. Tonon and T. Huber
Plansee AG, Reutte, AUSTRIA

Thursday morning, 5 October 1995
8:30 - 9:15 am – University Hall

Session Chair: R. O. Bangerter, *LBL*

8:30 1700 Plenary Speaker
Heavy Ion Fusion – Prospects and Status
W. B. Herrmannsfeldt
Stanford Linear Accelerator Center, Stanford, CA, USA

9:15 - 9:40 **Break**

Oral Session A – Ion Beam Fusion/ICF Targets
9:40 am - 12:00 n – Zuppke-Brundage Room

Session Chairs: W. Herrmannsfeldt, *SLAC*, and D. Schirmann, *CEA, CEL-V*

9:40 1701 **Overview of Light Ion Inertial Fusion**
J. P. Quintenz
Sandia National Laboratories, Albuquerque, NM, USA

10:10 1702 **Light Ion Fusion Developments Toward High Yield and Energy**
C. L. Olson, M. G. Mazarakis, R. E. Olson, P. F. Ottinger, D. A. Hammer, R. R. Peterson and D. R. Welch
Sandia National Laboratories, Albuquerque, NM, USA

10:30 1703 **Heavy Ion Fusion; Targets and Accelerators**
R. O. Bangerter
Lawrence Berkeley Laboratory, Berkeley, CA, USA

11:00 1704 **Inertial Fusion Target Development**
K. R. Schultz
General Atomics, San Diego, CA, USA

11:30 1705 **Target Design for a MJ Laser and Connected Experiments**
P. A. Holstein
CEA Limeil-Valenton, Villeneuve-Saint-Georges, FRANCE

12:15 - 1:30 **Distinguished Paper Luncheon**

Thursday morning, 5 October 1995

Oral Session B – Tokamaks/Spherical Tokamaks
9:40 am - 12:00 n – Illiniwek-Grange Room

Session Chairs: E. Bertolini, *JET*, and K. Ioki, *ITER*

9:40 2701 **The Frascati Tokamak Upgrade (FTU) After Four Years of Operation**
M. Gasparotto, A. Cecchini, S. Ciattaglia, V. Cocilovo, C. Crescenzi, F. Crisanti, A. Cucchiaro, L. Lovisetto, G. Maddaluno, A. Marra, G. Mazzitelli, S. Migliori, A. Pizzuto, B. Riccardi, M. Roccella, L. Semeraro and E. Sternini
ENEA-CRE, Frascati, Roma, ITALY

10:10 2702 **The START Spherical Tokamak**
A. Sykes, J. Booth, G. Crawford, G. Cunningham, N. Fawlk, M. Gryaznevich, J. Hugill, D. Robinson, R. Smith, T. Todd and B. Ward
UKAEA Government Division, Fusion, Abingdon, Oxon, UNITED KINGDOM

10:30 2703 **High Bootstrap Fraction in Ultra-Low Aspect Ratio Tokamaks for Volume Neutron Source Applications**
W. A. Houlberg
Oak Ridge National Laboratory, Oak Ridge, TN, USA

11:00 2704 **The Design of the Center Core of a Spherical Tokamak**
R. J. Colchin, P. H. Edmonds, J. D. Galambos, P. L. Goranson, S. P. Hirshman and J. R. Uglum
Oak Ridge National Laboratory, Oak Ridge, TN, USA

11:30 2705 **Spherical Tokamak System Studies: Next Step Devices to Reactors**
J. Galambos and Y.-K. M. Peng
Oak Ridge National Laboratory, Oak Ridge, TN, USA

12:15 - 1:30 **Distinguished Paper Luncheon**

Thursday morning, 5 October 1995
9:00 am -12:30 pm – Exhibit Hall, Midwest Ballroom

Poster Session – DIII-D; JET; Pellets

Session Chair: R. Callis, *GA*, and C. P. C. Wong, *GA*

0701 **Performance of the JET Pumped Divertor Cryopumpsystem**
W. Obert, K. Barth, L. Herblin, C. Mayaux, G. Saibene and E. Thompson
JET Joint Undertaking, Culham, Oxon, UNITED KINGDOM

0702 **Manufacture and Installation of JET MKII Divertor Support Structure**
G. Celentano, H. Altmann, A. Franklin, B. Macklin, P. Miele, M. A. Pick, R. Shaw and J. Tait
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

0703 **The Use of Carbon Fibre Composites in Divertor Target Plate Tiles and Structures**
H. Altmann, E. Deksnis, J. Fanthome, C. Froger, C. Lowry, A. Peacock and M. A. Pick
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

0704 **Operation of the 3.7 GHz LHCD System in JET**
M. Lennholm, Y. Baranov, J. Dobbing, A. Ekedahl, P. Finburg, B. Fischer, C. Gormezano, C. Gowers, A. Kaye, J. Plancoulaine, F. G. Rimini, J. Romero, P. Schild, A. Sips, F. Smits and F. Söldner
JET Joint Undertaking, Abingdon, Oxon, UNITED KINGDOM

0705 **Load Sensing and Related Control System for the Articulated Transporter of JET**
S. Colombi and T. Raimondi
Swiss Federal Institute of Technology, Lausanne, SWITZERLAND

0706 **Diagnostics for the JET MKII Divertor**
P. C. S. Prior and the JET Diagnostic Engineering Group
JET Joint Undertaking, Oxon, UNITED KINGDOM

0707 **Application of 'Best Fit' Survey Techniques Throughout Design, Manufacturing and Installation of the MKII Divertor at JET**
B. Macklin, R. Brade, G. Celentano, R. Shaw and J. Tait
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

0708 **Measured Currents in JET Limiters During Disruptions**
P. Andrew, J. Graham, P. Miele, P. Noll, R. Pearce, M. Pick and L. Rossi
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

0709 **The Poloidal Divertor Field Amplifiers for the JET Pumped Divertor**
D. Chiron, N. Dolgetta, M. Garribba, M. Huart, L. V. Lieshout, P. Noll, B. Sjouw and F. Zanelli
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

0710 **The JET Hydrogen-Oxygen Recombination Sensor - A Safety Device for Hydrogen Isotope Processing Systems**
J. L. Hemmerich and P. Milverton
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

0711 **Tritium and Uranium Inventory Measurements with the JET AGHS Precision Calorimeter**
J. L. Hemmerich, P. Milverton, G. Newbert, N. Green and A. Miller
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

0712 **The TF Ripple Experiment Modification of the JET Toroidal Field System**
M. Huart, D. Chiron, P. Doyle, V. Marchese, G. Sannazzaro, P. G. Smith, B. Tubbing and G. Zullo
JET Joint Undertaking, Abingdon, Oxon, UNITED KINGDOM

0713 **The JET Programme on the Development of Beryllium Clad Components for ITER**
D. Ciric, E. Deksnis, H. Falter, C. Ibbott, A. Peacock and M. Watson
JET Joint Undertaking, Abingdon, Oxfordshire, UNITED KINGDOM

0714 **Design and Analysis of a Radiative Divertor for Use in DIII-D**
M. A. Hollerbach, J. P. Smith, E. Chin and H. Shatoff
General Atomics, San Diego, CA, USA

0715 **First Measurements of the Ion Energy Distribution at the Divertor Strike Point During DIII-D Disruptions**
D. Whyte, R. Bastasz, P. B. Parks, N. H. Brooks, W. R. Wampler, W. P. West and C. P. C. Wong
General Atomics, San Diego, CA, USA

0716 **Cooling Water Conditioning and Quality Control for Tokamak**
A. M. Gootgeld
General Atomics, San Diego, CA, USA

0717 **Development of a New Error Field Correction Coil (C-Coil) for DIII-D**
J. I. Robinson and J. T. Scoville
General Atomics, San Diego, CA, USA

0718 **Adaptive Control System for the Fast Ferrite Tuner**
T. R. Senko and J. H. Rogers
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

0719 **4 MW Upgrade to DIII-D FWCD System: System Commissioning and Initial Operation**
W. P. Cary, F. W. Baity, G. Barber, R. W. Callis, J. S. deGrassie, S. W. Ferguson, T. E. Harris, R. O'Neill and R. I. Pinsker
General Atomics, San Diego, CA, USA

0720 **High Voltage Performance of RF Transmission Line Components on the DIII-D Fast Wave Current Drive System**
S. W. Ferguson, R. W. Callis, W. P. Cary, D. A. Phelps and D. Ponce
General Atomics, San Diego, CA, USA

0721 **A New Technique to Measure the Neutralizer Cell Gas Line Density Applied to a DIII-D Neutral Beamline**
D. N. Kessler, R. Hong and S. P. Riggs
General Atomics, San Diego, CA, USA

0722 **ECH Mirror Interface Tank for 110 GHz, 1 MW Gyrotron**
R. C. O'Neill, R. W. Callis, W. P. Cary, J. L. Doane, R. Gallix, T. R. Hodapp and C. P. Moeller
General Atomics, San Diego, CA, USA

0723 **A High Power Experimental Traveling Wave Antenna for Fast Wave Heating and Current Drive in DIII-D**
D. A. Phelps, H. Ikezi and C. P. Moeller
General Atomics, San Diego, CA, USA

0724 **Five Second Helium Neutral Beam Injection Using Argon-Frost Cryopumping Techniques**
J. Phillips, D. H. Kellman, R. Hong, J. Kim and G. J. Laughon
General Atomics, San Diego, CA, USA

0725 **Neutral Beam Shinethrough Power and Its Dependence on the Line Density of the DIII-D Plasma**
S. P. Riggs, R. Hong and D. N. Kessler
General Atomics, San Diego, CA, USA

0726 **Vanadium Alloys For The Radiative Divertor Program of DIII-D**
J. P. Smith, W. R. Johnson, R. D. Stambaugh, P. W. Trester, D. Smith and E. Bloom
General Atomics, San Diego, CA, USA

0727 **Improving Plasma Shaping Accuracy through Consolidation of Control Model Maintenance, Diagnostic Calibration, and Hardware Change Control**
D. Baggest, S. Pang, D. Rothweil, M. Walker and A. Nerem
General Atomics, San Diego, CA, USA

0728 **RF Power Diagnostics and Controls on the DIII-D, 4 MW, 30-120 MHz Fast Wave Current Drive System**
S. W. Ferguson, R. W. Callis, W. P. Cary, T. E. Harris and J. C. Allen
Lawrence Livermore National Laboratory, Livermore, CA, USA

0729 **A Flexible Software Architecture For Tokamak Discharge Control Systems**
J. R. Ferron, B. Penaflor, M. Walker, J. Moller and D. Butner
Lawrence Livermore National Laboratory, Livermore, CA, USA

0730 **A Combined PLC and CPU Approach to a Multiprocessor Control**
J. J. Harris, J. D. Broesch and R. M. Coon
General Atomics, San Diego, CA, USA

0731 **System Control and Data Acquisition of the Two New FWCD RF Systems at DIII-D**
T. E. Harris, J. C. Allen, W. P. Cary, S. W. Ferguson, C. C. Petty and R. I. Pinsker
General Atomics, San Diego, CA, USA

0732 **Distributed Timing System Control for DIII-D**
K. E. Knighton
General Atomics, San Diego, CA, USA

0733 **Conversion of the Central DIII-D Data Acquisition System to a UNIX Based Platform**
B. B. McHarg, Jr.
General Atomics, San Diego, CA, USA

0734 **Handling and Archiving of Magnetic Fusion Data at DIII-D**
J. F. VanderLaan and S. Miller
General Atomics, San Diego, CA, USA

0735 **Status of DIII-D Plasma Control**
M. Walker, J. R. Ferron, B. Penaflor, D. A. Humphreys, J. A. Leuer, A. W. Hyatt, C. B. Forest, J. T. Scoville and B. W. Rice
General Atomics, San Diego, CA, USA

0736 **ECH Control System for New 1 MW 110 GHz Gyrotrons at DIII-D**
A. L. Wright, J. Tooker, J. C. Allen, W. P. Cary and T. E. Harris
General Atomics, San Diego, CA, USA

0737 **Distributed Computing Testbed for a Remote Experimental Environment**
D. N. Butner, T. A. Casper, B. C. Howard, P. A. Henline, S. L. Davis, D. Barnes and D. E. Greenwood
Lawrence Livermore National Laboratory, Livermore, CA, USA

0738 **Improved Operating Scenarios of the DIII-D Tokamak as a Result of the Addition of UNIX Computer Systems**
P. A. Henline
General Atomics, San Diego, CA, USA

0739 **A UNIX based SCADA Software Package for the Machine Control and Neutral Beam Computers at DIII-D**
J. W. Cummings and P. A. Thurgood
General Atomics, San Diego, CA, USA

0740 **Data Acquisition Extensions For DIII-D Thomson Scattering**
C. C. Makariou, R. E. Stockdale, T. N. Carlstrom and C.-L. Hsieh
General Atomics, San Diego, CA, USA

0741 **Engineering Design of Cryocondensation Pumps for the DIII-D Radiative Divertor Program**
A. S. Bozek, C. B. Baxi, J. V. Del Bene, G. J. Laughon, E. E. Reis, H. D. Shatoff and J. P. Smith
General Atomics, San Diego, CA, USA

0742 **Thermal Deposition Analysis During Disruptions on DIII-D Using Infrared Scanners**
R. L. Lee, C. Lasnier, A. W. Hyatt, A. G. Kellman and P. L. Taylor
General Atomics, San Diego, CA, USA

0743 **Development of a Check Valve for Two-stage Pellet Injectors**
A. Reggiori, G. B. Daminelli, R. Carlevaro and G. Riva
CNPM-CNR, Peschiera B., ITALY

0744 **Development of Repetitive Railgun Pellet Accelerator and Steady-State Pellet Supply System**
Y. Oda, K. Azuma, M. Onozuka, S. Kasai and K. Hasegawa
Mitsubishi Heavy Industries, Ltd., Yokohama, JAPAN

0745 **Multishot Pellet Injection System for RFX**
W. Baker, L. Garzotti, P. Innocente, S. Martini, S. Vitturi, P. Zaccaria, J. Bundgaard, B. Sass and H. Sorensen
ENEA - CNR, Università di Padova, Padova, ITALY

0746 **Development and Validation of a Railgun Hydrogen Pellet Injector Model**
T. King and K. Kim
University of Houston, Houston, TX, USA

0747 **Detonation Drive Pellet Injector**
N. Nishino, T. Ushijima, T. Oka, H. Koyama, X. Chang and S. Taki
Hiroshima University, Higashi, Hiroshima, JAPAN

0748 **Development of Advanced Compact Railguns for Injection of Hypervelocity Hydrogen Pellets into Magnetic Fusion Plasmas**
K. Kim, M. W. Tompkins, M. Anderson, Q. Feng, J. Zhang and T. King
University of Illinois at Urbana-Champaign, Urbana, IL, USA

0749 **The Tritium Pellet Injector TPI-1**
G. L. Saksagansky, V. N. Skripunov, P. Yu. Koblents, B. V. Kuteev and I. V. Viniar
D.V. Efremov Institute, St. Petersburg, RUSSIA

0750 **Innovative Device Producing Double-Layer Cryogenic Pellet**
S. Sudo and H. Itoh
National Institute for Fusion Science, Nagoya, JAPAN

0751 **A Two-Stage Pneumatic Repeating Pellet Injector for the Refueling of Magnetically Confined Plasmas in Long-Pulse Fusion Experiments**
A. Frattolillo, S. Migliori, F. Scaramuzzi, M. Capobianchi, C. Domma, G. Ronci, S. K. Combs, S. L. Milora and C. R. Foust
ENEA-C.R., Frascati, Rome, ITALY

0752 **New Lattice-Nucleus Coupling Mechanisms and Possible Energy Production**
P. L. Hagelstein
MIT Plasma Fusion Center, Cambridge, MA, USA

0753 **Anomalous Heat Evolution of Deuteron Implanted Al on Electron Bombardment**
K. Kamada, H. Kinoshita and H. Takahashi
National Institute for Fusion Science, Nagoya, JAPAN

0754 **Chemically Assisted Nuclear Reactions**
E. Storms
ENECO, Santa Fe, NM, USA

0755 **Reduction of Tritiated Methane Over Zr-Fe-Mn, Fe and Ni**
A. B. Antoniazzi and W. T. Shmayda
Ontario Hydro Technologies, Toronto, Ontario, CANADA

Thursday afternoon, 5 October 1995
1:30 - 2:15 pm – University Hall

Moderator: K. Schoenberg, *LANL*

1:30 1800 Panel - Fusion Applications
Non-Power Producing Applications of Fusion R&D
J. Treglio, J. Haines, J. Conrad and J. Conrads

2:15 - 2:40 **Break**

Oral Session A – Heating and Fueling
2:40 - 5:00 pm – Zuppke-Brundage Room

Session Chairs: D. D. Ryutov, *BNPI*, and L. Steinhauer, *U Wash*

2:40 1801 **The Technology of ICRF Systems**
F. Baity, D. Hoffman, G. Barber, T. Bigelow, R. Goulding and P. Ryan
Oak Ridge National Laboratory, Oak Ridge, TN, USA

3:10 1802 **Development of the Folded Waveguide as an Advanced ICRF Antenna**
T. S. Bigelow, M. D. Carter, C. H. Fogelman, J. J. Yugo, F. W. Baity, G. L. Bell, J. B. O. Caughman, W. L. Gardner, D. J. Hoffman, R. H. Goulding, P. M. Ryan, D. W. Swain, D. J. Taylor, R. Wilson, H. Kugel and M. Ono
Oak Ridge National Laboratory, Oak Ridge, TN, USA

3:30 1803 **The Measurement of Neutral Beam Thermal Profiles on 'V'-Shaped Carlorimeters**
J. H. Kamperschroer, L. R. Grisham, B. E. McCormack, R. A. Newman, M. E. Oldaker, T. E. O'Connor, T. N. Stevenson and A. von Halle
Princeton Plasma Physics Laboratory, Princeton, NJ, USA

4:00 1804 **Development of Pellet Injection Systems for ITER**
S. Combs, M. Gouge, L. Baylor, C. Foust, P. Fisher, S. Milora and D. Schechter
Oak Ridge National Laboratory, Oak Ridge, TN, USA

4:30 1805 **Pellet Acceleration Using an Ablation-Controlled Electrothermal Launcher**
R. W. Kincaid, M. A. Bourham and J. G. Gilligan
North Carolina State University, Raleigh, NC, USA

Thursday afternoon, 5 October 1995

Oral Session B – Experiment Design/Results

2:40 - 5:00 pm – Grange Room

Session Chairs: M. Lubbell, *ORNL*, and M. Lennholm, *JET*

2:40 2801 **Conceptual Design of SST-1 Tokamak**
A. Amardas and SST Team
Institute for Plasma Research, Bhat, Gandhinagar, INDIA

3:10 2802 **Recent Results from the TdeV Tokamak and Design Status of the Major Divertor Upgrade**
R. Bolton
Centre Canadien de Fusion Magnetique, Varennes, Quegbec, CANADA

3:30 2803 **Recent Progress of JT-60U Experiments**
M. Kikuchi and JT-60 Team
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

4:00 2804 **Negative-ion Based NBI System for JT-60U**
M. Kuriyama, N. Akino, M. Araki, N. Ebisawa, M. Hanada, T. Inoue, M. Kawai, M. Kazawa, J. Koizumi, K. Miyamoto, N. Miyamoto, K. Mogaki, Y. Ohara, T. Ohga, Y. Okumura, H. Oohara, K. Ohshima, F. Satoh, S. Takahashi, T. Takenouchi, H. Usami, K. Usui, K. Watanabe, M. Yamamoto, T. Yamazaki, Y. Ono and S. Kawashima
Naka Fusion Research Establishment, JAERI, Naka-gun, Ibaraki-ken, JAPAN

4:30 2805 **Operations of LHD**
O. Motojima
National Institute for Fusion Science, Toki City, Gifu, JAPAN