

# 11<sup>TH</sup> INTERNATIONAL CONFERENCE ON WWER FUEL PERFORMANCE, MODELLING AND EXPERIMENTAL SUPPORT

26 September- 03 October 2015, Golden Sands Resort, Bulgaria

Hosted by the Institute for Nuclear Research and Nuclear Energy – BAS,  
in co-operation with the International Atomic Energy Agency,

## AGENDA

**26–27 September (Friday–Sunday): Participants arrival and registration, excursions on request**

**27 September (Sunday evening): Welcome cocktail dinner at hotel Bolero, Golden Sands Resorts**

**28 September (Monday), Hotel Bolero Conference Hall**

**09:00–10:45 Morning session**

### **Session O: Opening session**

*Chairpersons: D.Tonev (INRNE-BAS), U.Basak (IAEA), Y. Yankov. (Kozloduy NPP), V. Molchanov (TVEL), Yu. Ryabinin.(Rosenergoatom).*

#### **Opening and greetings:**

*D.Tonev (INRNE–BAS), U.Basak (IAEA), Y. Yankov. (Kozloduy NPP), V. Molchanov (TVEL)*

- 0.1. D.Tonev** INRNE ACHIEVEMENTS IN THE FIELD OF ACCELERATORS AND NUCLEAR ENERGY, *D.Tonev (INRNE-BAS Director, Bulgaria)*
- 0.2. U.Basak** IAEA ACTIVITIES IN THE AREA OF NUCLEAR POWER REACTOR FUEL ENGINEERIN, *U. Basak (IAEA, Austria)*
- 0.3. A.Ugryumov** NUCLEAR FUEL FOR NPP: CURRENT STATUS AND MAIN FIELDS OF THE DEVELOPMENT, *A.Ugryumov, TVEL, Russia*
- 0.4. Yu.Ryabinin** NUCLEAR FUEL OPERATING EXPERIENCE IN IMPLEMENTING THE PROGRAM OFR POWER GENERATION INCREASE AT VVER NPPS OF JSC CONCERN ROSENERGOATOM, *Yu.A Ryabinin, JSC «Concern Rosenergoatom»*

**10:45–11:00 Coffee break**

### **SESSION 1 FUEL PERFORMANCE AND OPERATIONAL EXPERIENCE**

**11:00–12:30 Morning session**

*Chairpersons: K.Kamenov, V.Mecir*

- 1.1. K. Kamenov** EXPERIENCE OF TVSA FUEL IMPLEMENTATION AT KOZLODUY NPP, *K. Kamenov, Al. Kamenov, Kozloduy NPP, Bulgaria*
- 1.2. A. Morozov** NUCLEAR FUEL OPERATION AT BALAKOVO NPP, *A. Morozov, Subsidiary of JSC “Concern Rosenergoatom”, “Balakovo Nuclear Power Plant” (Balakovo NPP)*
- 1.3. A.Tsvetkov** PARTICULARITIES OF IMPLEMENTING NEW TYPES OF NUCLEAR FUEL AT KALININ NPP, *Tsvetkov Aleksei, Kalinin NPP.*

- 1.4. V.Adeev** CORE DESIGN EXPERIENCE OF WWER-440 REACTORS WHEN THEY WORKING ON INCREASED POWER LEVEL., Adeev V.A., Panov A.E., Melenchuk I.S., Kola NPP, Polyarnye Zori, Russian Federation
- 1.5. J. Zýbal** INITIAL OPERATIONAL EXPERIENCE WITH GD-2M+ FUEL AT DUKOVANY NPP, M. Borovička, J. Zýbal, Dukovany NPP, ČEZ.

**12:30–14:00 Lunch**

**14:00–15:30 Afternoon session**

Chairpersons: A.Ugryumov, Ch.Ganguly , L.Kekonnen

- 1.6. V. Saprykin** MAIN RESULTS ON PILOT OPERATION DURING 5 YEARS OF THE 3RD GENERATION FUEL IN VVER-440 REACTORS OF KOLA NPP, V.V.Saprykin, Sumorokov, A.A.Gagarinski, NRC "Kurchatov Institute" Adeev V.A., Kola NPP
- 1.7. L. Kekkonen** .FUEL RELIABILITY EXPERIENCE IN FINLAND, Laura Kekkonen, Fortum Power and Heat Ltd, POB 100, FI-00048 Fortum, Finland
- 1.8. I. Lehtinen** POOL-SIDE INSPECTIONS AT LOVIISA NPP, Iiro-Ville Lehtinen, Fortum Power and Heat Ltd, POB 100, FI-00048 Fortum, Finland
- 1.9. D. Nesaraj** CALCULATIONS WITH MCU FOR INITIAL FUEL LOADING AND APPROACH TO FIRST CRITICALITY OF KKNPP UNIT-1, David Nesaraj, Y. K. Pandey, Ashok Chauhan, Fuel Cycle Management, Engg. Directorate (LWR), Nuclear Power Corporation of India Limited, Mumbai, India
- 1.10. D. Parrat** THE FUTURE JULES HOROWITZ MATERIAL TESTING REACTOR: A WAY FOR DEVELOPING INTERNATIONAL COLLABORATION AROUND A MAJOR EUROPEAN IRRADIATION INFRASTRUCTURE D. Parrat, G. Bignan, B. Maugard, C. Gonnier, CEA Cadarache

**15:30–15:50 Coffee break**

**15:50–18:00 Afternoon session (cont.)**

Chairpersons: S. Hettiarachchi, J.Deshon

- 1.11. M. Dye** ENHANCED WESTINGHOUSE WWER-1000 FUEL DESIGN FOR UKRAINE REACTORS, Mark E.Dye, Herman H.Shah, Westinghouse, SC, USA
- 1.12. M. Dye** OPTIMIZED CORE LOADING SEQUENCE FOR UKRAINE WWER REACTORS, Mark E., Westinghouse, SC, USA
- 1.13. C.Önneby** PERFORMANCE OF THE WESTINGHOUSE WWER-1000 FUEL DESIGN, Westinghouse, Sweden
- 1.14. Y. Bilodid** SOME ASPECTS OF NUCLEAR FUEL UTILISATION AT UKRAINIAN NPPS DURING LAST TWO YEARS, , I. Shevchenko, M. Ieremenko, I. Ovdiienko, State Scientific and Technical Centre for Nuclear and Radiation Safety, (SSTC N&RS), Kyiv, Ukraine
- 1.15. S. Hettiarachchi** BWR FUEL PERFORMANCE UNDER ADVANCED WATER CHEMISTRY CONDITIONS – A DELICATE JOURNEY TOWARDS ZERO FUEL FAILURES – A REVIEW, S. Hettiarachchi, USA

**18:30–21:30 Dinner**

**29 September (Tuesday), hotel Bolero Conference Hall**

**SESSION 2 IMPROVEMENT OF FUEL DESIGN AND OPERATION**

**09:00–10:30 Morning session**

*Chairpersons: I.Vasilchenko, I.Evdokimov*

- 2.1. I. Vasilchenko** MODERN VVER CORE DESIGN, I.N.Vasilchenko, S.A.Kushmanov, V.V.Vyalitsyn, R.I.Vasilchenko, OKB «GIDROPRESS», Podolsk, Russia
- 2.2. S. Zotov** TVSA-12 FOR BULGARIAN NPP, Sholin E.V., Zotov S.A., JSC «Afrikantov OKBM», Nizhny Novgorod, Russian Federation.
- 2.3. E. Sholin** JUSTIFICATION OF TVSA MODIFICATION WITHOUT AXIAL FIXING OF FUEL RODS IN SUPPORT PLATE, M.A. Sholin E.V. JSC «Afrikantov OKBM», Nizhny Novgorod, Ugrumov A.V., Shishkin A.A., JSC «TVEL», Moscow
- 2.4. Y. Bezrukov** EXPERIMENTAL STUDIES UNDER THE SUBSTANTIATION OF REPRESENTATIVENESS THE TEMPERATURE CONTROL CORE OF THE REACTOR VVER-TOI, A.N. Churkin, Y.A. Bezrukov, I.N. Vasil'chenko, M.N. Supronenko, S.M. Lobachev, E.A. Lisenkov, S.A. Kushmanov, OKB "GIDROPRESS", Podolsk, Russian Federation

**10:30-10:50 Coffee break**

**10:50 –12:00 Morning session (cont.)**

*Chairpersons: P.Aksenov, Yu.Bezrukov*

- 2.5. D. Oleksyuk** EXPERIMENTAL INVESTIGATIONS ON THE EFFICIENCY OF HEAT EXCHANGE INTENSIFYING SPACER GRIDS, L.L. Kobzar, D.A. Oleksyuk, NRC 'Kurchatov Institute', Moscow, Russian Federation
- 2.6.D.Kireeva** NUMERICAL INVESTIGATIONS ON THE EFFECT OF THE AXIAL INTERVAL BETWEEN INTENSIFYING SPACER GRIDS ON THE CRITICAL HEAT FLUX VALUE FOR FUEL ASSEMBLIES WITH NON-UNIFORM AXIAL POWER DISTRIBUTION, D.R. Kireeva, D.A. Oleksyuk, NRC "Kurchatov Institute", Moscow, Russia
- 2.7. V. Makarov** ANALYTICAL AND EXPERIMENTAL ASSESSMENT OF TVS-2006 FUEL ASSEMBLY THERMAL-MECHANICAL SHAPE DEFORMATION AT TEMPERATURE MODELING OF A LOSS-OF-COOLANT ACCIDENT, A.V.Afanasiev, V.V.Makarov, V.P.Semishkin, I.V.Matvienko, D.N.Puzanov, JSC OKB "GIDROPRESS", Podolsk, Russia
- 2.8. V. Makarov** EXPERIMENTAL STUDIES OF RESISTANCE TO FRETTING WEAR OF FUEL RODS FOR TVS VVER-1000 FA AND TVS-KVADRAT FUEL ASSEMBLIES, V.V.Makarov, A.V.Afanasiev, Yu.V.Egorov, I.V.Matvienko, JSC OKB GIDROPRESS, Podolsk, Russia

**12:00–13:30 Lunch**

**14:00–15:10 Afternoon session**

*Chairpersons: F.Sokolov, E. Kosourov*

- 2.9. E. Kosourov** VVER-1000 FUEL CYCLES: CURRENT STATUS AND OUTLOOK, E.S. Volkov, E.K. Kosourov, V.I. Pavlov, A.M. Pavlovichev, V.V. Saprykin, A.I. Shcherenko, NRC „Kurchatov Institute“
- 2.10. A. Gagarinski** VVER-440 FUEL CYCLE PROSPECTS. FIFTEEN-MONTH FUEL CYCLES, A.A. Gagarinski, E.G. Ivanova, NRC "Kurchatov Institute".
- 2.11. S. Zotov** PROSPECTS OF TVSA-12PLUS, TVSA-4 FUEL DEVELOPMENT FOR VVER-1000 REACTORS, Morozkin O.N., Zotov S.A., JSC «Afrikantov OKBM», Nizhny Novgorod, Russian Federation.

**15:10–15:30 Coffee break**

**15:30–17:30 Afternoon session (cont.)**

**Panel Discussion A:**

Fuel performance and operational experience  
Improvement of fuel design and operation

*Chairpersons: V.Mecir,, K.Kamenov,  
L.Kekonnen, A.Ugryumov,  
S.Hettiarachchi, M.Dye,  
I. Vasilchenko, Evdokimov,  
P.Aksenov, Yu.Bezrukov,  
F.Sokolov, E. Kosourov  
Ch.Ganguly, J.Deshon*

**18:30–21:30 Dinner**

**30 September (Wednesday), hotel Bolero Conference Hall**

**SESSION 3 FUEL MODELLING AND EXPERIMENTAL SUPPORT**

**09:00–10:30 Morning session**

*Chairpersons: P.Van Uffelen, A.Burukin,*

- 3.1. P. Van Uffelen** DEVELOPMENTS FOR THE TRANSURANUS CODE IN THE FRAME OF THE FUMAC PROJECT, P. Van Uffelen, A. Schubert, J. van de Laar, P. Blair, C. Győri, G. Spykman.
- 3.2. B. Volkov** IN-PILE EXPERIMENTAL INVESTIGATIONS OF FUELS AND MATERIALS DEGRADATION IN THE HALDEN REACTOR, B. Yu- Volkov, M. A. McGrath, T. Tverberg
- 3.3. A.Burukin** CAPABILITIES OF UNIQUE EXPERIMENTAL REACTOR BASIS OF JSC "SSC RIAR" FOR FEASIBILITY OF WWER FUEL, A.V. Burukin, A.L. Izhutov, S.A. Ilyenko, V.V. Kalygin, V.A. Ovchinnikov, JSC "SSC RIAR", Dimitrovgrad-10, 433510, Russian Federation.

**10:30-10:45 Coffee break**

**10.45 – 12.30 Morning session (cont.)**

*Chairpersons: V.Novikov, A.Shestopalov*

- 3.4. A.Shestopalov** DEVELOPMENT OF THE THERMAL-HYDRAULIC 3D-MODULE FOR THE START-3A THERMOMECHANICAL CODE, Čížek J. (SC «ALVEL»), Shestopalov A.A., Sypchenko M.V. (SC «VNIINM»)
- 3.5. D. Pizzocri** MODELLING OF BURST RELEASE IN OXIDE FUEL AND APPLICATION TO THE TRANSURANUS CODE, D. Pizzocri, G. Pastore, L. Luzzi, P. Van Uffelen,P, Politecnico di Milano, Italy, ITU,Germany
- 3.6. J.Klouzal** ENHANCEMENTS IN THE FUEL ROD PERFORMANCE MODELLING SUPPORT OF WWER FUEL.,J.Klouzal, M. Dostál,J. Hejzlar, - ÚJV Řež V. Stary, D. Ernst, ALVEL, Čez
- 3.7. V.Shulimov** VVER TEST METHOD AND SOME RESULTS OF THE VVER-1000 HIGH BURNUP FUEL IRRADIATION TESTING IN THE MIR REACTOR UNDER THE DESIGN-BASIS RIA SCENARIO CONDITIONS, Alekseev A.V., Kiseleva I.V., Shulimov V.N., SSC RIAR JSC, Dimitrovgrad, Russian Federation.
- 3.8. A. Gusev** STATE AND PERSPECTIVES OF METHODOLOGICAL SUPPORT OF MATERIALS RESEARCH OF PRODUCTS FROM ZIRCONIUM ALLOYS FOR FUEL RODS AND FUEL ASSEMBLIES OF VVER, Gusev A., Markelov V., Novikov V., Zheltkovskaya T., Malgin A., Bekrenev S., (JSC "VNIINM")

**3.9 M.Miklos** FUTURE POSIBILITIES OF SUSEN TECHNOLOGIES FOR R&D OF NUCLEAR FUEL CLADDING, Marek Mikloš, Petra Bublíková , Ondřej Srba, Centrum výzkumu Řež s.r.o., Czech Republic

**12:30–14:00** Lunch

**14:00–19:00** Bus trip to Balchik and Winery (in two groups)

**01 October (Thursday), hotel Bolero Conference Hall**

**SESSION 3 FUEL MODELLING AND EXPERIMENTAL SUPPORT (CONT.)**

**09:00–10:30** Morning session

*Chairpersons: B.Volkov, E. Mikheev,*

**3.10. E.Mikheev** FRACTURE TOUGHNESS OF WWER URANIUM DIOXIDE FUEL PELLETS WITH VARIOUS GRAIN SIZE, Sivov R.B., Novikov V.V., Mikheev E.N., Fedotov A.V., JSC «VNIINM», Moscow, Russia

**3.11. E.Mikheev** ADDITIONAL RESEARCH RESULTS OF RADIATION CREEP FOR URANIUM DIOXIDE FUEL WITH LARGE GRAIN SIZE IN TEMPERATURE RANGE OF 650–1050 V.B. Malygin (NRNU MEPhI), A.L. Izhutov, S.V. Seredkin, G.A. Ilyinykh, JSC «SSC RIAR

□ C, E.N

**3.12. T.Novotny** HYDROGENATION AND HIGH TEMPERATURE OXIDATION OF ZIRCONIUM CLADDINGS, Tamás Novotny, Erzsébet Perez-Feró Hungarian Academy of Sciences, Centre for Energy Research, Budapest, Hungary

**3.13. J. Kättö** MULTIPHYSICS SIMULATIONS OF FAST TRANSIENTS IN VVER-1000 AND VVER-440 REACTORS, Elina Syrjälähti, Ville Valtavirta, Joonas Kättö, Henri Loukusa, Timo Ikonen, Jaakko Leppänen, Ville Tulkki (VTT Technical Research Centre of Finland, P.O.Box 1000, FI-02044 VTT, Finland

**3.14. M.Szuta** MODELLING OF HELIUM RELEASE FROM THE HIGHLY BURNED FUEL DURING ANNEALING AND IMPACT ON ITS MIGRATION IN THE URANIUM DIOXIDE FUEL DURING NEUTRON IRRADIATION, Marcin Szuta, Ludwik Dąbrowski, National Centre for Nuclear Research, Otwock-Świerk, Poland

**10:30–10:45** Coffee break

**SESSION 4 FUEL SAFETY AND QA**

**10:45–12:30** Morning session (cont)

*Chairpersons: J.Klouzal, P.Fedotov*

**4.1. P. Fedotov** POST-TEST CALCULATION MODELING OF MIR-LOCA/72 EXPERIMENT BY RAPTA 5.2 CODE, A.V. Kumachev, V.I. Kuznetsov, O.A. Nechaeva, V.V. Novikov, A.V. Salatov, M.V. Sypchenko, P.V. Fedotov, SC «VNIINM», Moscow

**4.2. P.Fedotov** PULSE TESTS OF REFABRICATED VVER FUEL RODS IN THE BIGR TO JUSTIFY SAFETY UNDER DESIGN BASIS RIA CONDITIONS, O.A.Nechaeva, V.V.Novikov, V.I.Kuznetsov, A.V.Salatov, P.V.Fedotov, SC «VNIINM»

**4.3. P. Fedotov** INFLUENCE OF PRE-HYDRIDING ON EMBRITTLEMENT OF E110 ALLOY UNDER LOCA CONDITIONS, V.V. Novikov, V.I. Kuznetsov, A.V. Salatov, P.V. Fedotov, O.A. Nechaeva SC «VNIINM», Moscow, D.N. Ignatyev, A.A. Mokrushin, D.M. Soldatkin, A.A. Ursov, FSUE SRI SIA "LUCH", Podolsk, Russia

- 4.4. **B. Nesterov** MODELLING OF THE RAMP POWER TESTS WITH VVER-1000 FUEL ROD WITHOUT CENTRAL HOLE BY **ANSYS** CODE, A. V. Krupkin, V. I. Kuznetsov, V. V. Novikov, B. I. Nesterov, SC "VNIINM", Moscow
- 4.5. **M. Malá** CVR/UJV SUPPORT TO FUEL INSPECTIONS AT TEMELIN NPP, Martina Malá, Jan Klouzal, Martin Dostál, Czech Republic
- 4.6. **A. Osadchiy** NUCLEAR SAFETY DURING STORAGE AND TRANSPORTATION OF FUEL ASSEMBLIES WITH URANIUM ENRICHMENT OF 5,0% AT NPP WITH VVER REACTOR, A. I. Osadchiy (NRC «Kurchatov institute»)

**12.30 – 14:00 Lunch**

**SESSION 5 SPENT FUEL PERFORMANCE AND MANAGEMENT**

**14:00–15:45 Afternoon session**

*Chairpersons: E.Zvir, G.Shevlyakov*

- 5.1. **E. Zvir** TESTING OF VVER-1000 FUEL RODS OF VARIOUS DESIGNS AND FUEL BURNUPS UNDER DRY STORAGE CONDITIONS, E.A. Zvir, V.A. Zhitelev, P.I. Grin, P.A. Ilyin, SSC RIAR JSC, Dimitrovgrad, Russia
- 5.2. **D. Ivanov** THREE DIMENSIONAL CALCULATIONS OF THE DOSES ON OUTER SURFACE OF TRANSPORT CONTAINER TK-13, WHICH CONTAINS FUEL OF ENLARGED URANIUM CAPACITY AND HAS BURNUP UP TO 70 MW/DAY\*KG FM, D. T. Ivanov, V.V. Sinitsa (NRC «Kurchatov institute»)
- 5.3. **G. Shevlyakov** STATE OF VVER-1000 SPENT U-Gd FUEL RODS ON THE RESULTS OF POST-IRRADIATION EXAMINATIONS, G.V. Shevlyakov, E.A. Zvir, A.V. Stozhuk, V.S. Polenok, O.G. Sidorenko, I.N. Volkova, O.N. Nikitin, SSC RIAR JSC, Dimitrovgrad, Russia
- 5.4. **T. Aliev** MODELING OF DIMENSIONAL CHANGES OF SPENT WWER FUEL RODS DURING DRY STORAGE, T.N. Aliev, I.A. Evdokimov, V.V. Likhanskii, A.A. Sorokin, M.Yu. Kolesnik, A.N. Kozhakin, V.G. Zborovskii, E.A. Zvir, P.A. Ilyin, A.A. Shishkin, A.V. Ugumov,, TRINITI, Russia
- 5.5. **S. Bznuni** ANALYSIS OF RE-RACKING OF THE SPENT FUEL POOL OF WWER-440 REACTOR, N. Baghdasaryan, A. Amirjanyan, P. Kohut, J. Ramsey Nuclear and Radiation Safety Center, Yerevan, Armenia

**15:45–16:00 Coffee break**

**SESSION P POSTER SESSION**

**16:00–17:00 Afternoon session (cont.), Poster Session Hall**

*Chairpersons: F.Sokolov, J.Biro, M.Isaenkova*

- P.1. MODELS OF SPECIFIC HEAT AND THERMAL CONDUCTIVITY OF URANIUM DIOXIDE, Baranov V.G., Devyatko Yu.N., Novikov V.V.1, Tenishev A.V., **Khomyakov O.V.**, Chulkin D.A., National Research Nuclear University (MIPhI), JSC «VNIINM», Russian Federation,
- P.2. SPECIAL STORAGE OF LEAKING FUEL AT PAKS NPP, **Janos Biro**, MVM Paks NPP, Hungary
- P.3. ROLE OF PLASTIC DEFORMATION IN COMPACTION OF URANIUM DIOXIDE POWDER, V.G. Baranov, A.V. Lunev, A.V. Tenishev, S.A. Pokrovskiy, O.A. Krymskaya, A.A. Zazolin, D.A. Pchelyakov, M.G. Isaenkova, Yu.A. Perlovich, National Research Nuclear University (MIPhI), Russian Federation

- P.4. STRUCTURE AND TEXTURE CHANGES IN CLADDING TUBES FROM ZR-BASED ALLOYS UNDER INFLUENCE OF PROLONGED NEUTRON IRRADIATION, Perlovich Yu., **Isaenkova M.**, Fesenko V., Kobylyanskiy G., Goncharenko Yu., (MEPhI), Moscow, Russia
- P.5. REGULARITIES OF CRYSTALLOGRAPHIC TEXTURE FORMATION IN CLADDING TUBES FROM ZR-BASED ALLOYS BY THEIR PRODUCTION, Isaenkova M., **Perlovich Yu.**, Fesenko V., Krymcraya O., (MEPhI), Moscow, Russia
- P.6. SIMULATION OF THE POWER PROFILE IN GADOLINIUM-DOPED FUEL RODS WITH THE FUEL PERFORMANCE CODE RTOP, V.V. Likhanskii, **I.A. Evdokimov**, V.G. Zborovskii, A.A. Sorokin, S.A. Tokarev, SRC RF TRINITI
- P.7. MODELING IS SUPPORT OF EXPERIMENTS IN THE MIR REACTOR TO ASSURE SAFE OPERATION OF NUCLEAR FUEL OF ADVANCED DESIGN, **A. Sorokin**, V. Likhanskii, I. Evdokimov, V. Zborovskii, E. Afanasieva, V. Kanukova, K. Ulibyshev, M. Chernetskii, SRC RF TRINITI, Moscow, Troitsk, Russian Federation, A. Izhutov, S. Ilyenko, Yu. Kudrin, I. Kiseleva, A. Goryachev, JSC SSC RIAR, Dimitrovgrad, Russian Federation
- P.8. EVALUATED EXPERIMENTAL DATABASE ON CRITICAL HEAT FLUX IN WWER FA MODELS, S.N Artamonov, **V.V. Sergeev**, State Scientific Centre of the Russian Federation – Institute for Physics and Power Engineering, Obninsk, Russia, S.E. Volkov, JSC TVEL, Moscow, Russia
- P.9. EFFECT OF MIXING GRIDS ON CRITICAL POWER LEVEL OF FUEL ASSEMBLIES IN VVER REACTOR, Selivanov Yu.F., Pometko R.S. (FSUE “SSC RF-IPPE”, Obninsk, Russia), Volkov S.E. (AO “TVEL”, Moscow, Russia.
- P.10. FUEL ENGINEERING ROLE TO ASSURE FUEL QUALITY IN ARGENTINA”, **A. Bussolini**, P. Trípodì, L. A. Alvarez, Fuel Engineering Department, Constituyentes Atomic Center - National Commission on Atomic Energy, Argentina.

**17:00 – 18:15 Panel Discussion B:**

Fuel modelling and experimental support  
 Fuel safety and QA  
 Spent fuel performance and management  
 Poster session

*Chairpersons:*

*F.Sokolov, S.Hettiarachchi,  
 B.Volkov, P. Van Uffelen,  
 J.Klouzal, V.Novikov  
 P.Fedotov, E.Mikheev, A.Burukin.  
 E.Zvir, G.Shevlyakov, A.Shestopalov,  
 M.Isaenkova, J.Biro*

**18:45–23:30 Bus trip for folklore dinner and wine testing**

**02 October (Friday)**

**SESSION 6 SPECIFIC ISSUES OF WWER-1000 FUEL RELIABILITY**

**09:00–11:00 Morning session**

*Chairpersons: V.Molchanov, D.Davidov*

**6.1. V. Molchanov** THE "ZERO FAILURE LEVEL" PROJECT: ORGANIZATION, STATUS, TASKS, V. Molchanov, JSC "TVEL", Moscow

**6.2. I. Evdokimov** IDENTIFICATION AND ANALYSIS OF DOMINANT FACTORS AFFECTING THE FUEL FAILURE RATES IN WWER-1000 UNITS IN CZECH REPUBLIC, BULGARIA, UKRAINE AND RUSSIA, I.A. Evdokimov, V.V. Likhanskii, E.Yu. Afanasieva, V.D. Kanukova, A.N.

Kozhakin, L.A. Maslova, M.G. Chernetskiy, V.G. Zborovskii, A.A. Sorokin, (SRT TRINITI), V.L. Molchanov, R.M. Mingazov, TVEL fuel company, Moscow, Russia

- 6.3. I. Asatiani** OPERATION RESULTS OF WWER FUEL MANUFACTURED AT PJSC MSZ, Kuznetsov, I. Asatiani, PJSC“MSZ”
- 6.4. D. Davidov** OPERATION RESULTS OF VVER FUEL ASSEMBLIES MANUFACTURED AT PJSC NCCP, D. Davidov, O. Brovkin, Y. Bezborodov, PJSC«NCCP»
- 6.5. P. Aksenov** NUCLEAR FUEL MANUFACTURE AT PJSC MSZ. TECHNOLOGICAL DEVELOPMENT AND QUALITY ASSURANCE, E. Bagdatyeva, P. Aksenov, PJSC “MSZ”

**11:00 11:15 Coffee break**

**11:15 – 13:15 Morning session (cont)**

*Chairpersons: P.Aksenov, I.Evdokimov*

- 6.6. D. Pluzhnikov** NUCLEAR FUEL MANUFACTURE AT PJSC NCCP. TECHNOLOGY DEVELOPMENT AND QUALITY ASSURANCE, Yu. Goncharov, A. Enin, L. Kustov, I. Mokshin, D. Pluzhnikov. PJSC«NCCP»
- 6.7. A.Kutyavin** MANUFACTURING OF ZIRCONIUM PRODUCTS AT CHEPETSK MECHANICAL PLANT, STOCK COMPANY (CMP, SC).PROSPECTS OF DEVELOPMENT AND PRODUCTS QUALITY ASSURANCE Kutyavin Anatoliy N.,CMP SC, Glazov.
- 6.8. Y. Mironov** THE OUTCOME OF THE WORKING VISITS BY THE EXPERTS TO THE FUEL PROVIDER ENTERPRISES IN ORDER TO ACHIEVE THE OBJECTIVES OF THE "ZERO FAILURE LEVEL" PROJECT, V. Molchanov, Y. Mironov, JSC "TVEL", Moscow
- 6.9. D.Chirkin** FUEL REARRANGEMENT BETWEEN SECTORS OF 60° SYMMETRY AT TRANSPORTATION AND INSTALLATION ON NPP WITH REACTOR OF VVER-Lo1000 TYPE, Samsonov M.A., Chirkin D.E., Peskov R.A., JSC “Afrikantov OKBM”, Nizhny Novgorod
- 6.10. A.Girchenko** THE REQUIREMENTS TO INFORMATIVITY OF METHODS OF FFD ON NPP WITH WWER AT ACCEPTANCE OF THE CONCEPT OF ZERO REFUSAL, V.N.Miglo, NRC «Kurchatov institute»
- 6.11. Yu. Shestakov** PROBLEMS AND PERSPECTIVES OF MOVING TOWARD ZERO FUEL FAILURES AND MITIGATION OF FUEL FAILURE CONSEQUENCES AT NPPS WITH VVER REACTORS IN RUSSIA., PhD Yu. M. Shestakov, A. S. Semenovych, SC "VNIIAES", Russia.

**13:15 – 14:30 Lunch**

**14:30 – 16:00 - Conference overall discussion and conclusions**

*Chairpersons: F.Sokolov, S.Hettiarachchi, I.Vasilchenko,  
B. Volkov, P.Van Uffelen, Yu.Bezrukov,  
J.Klouzal, V.Novikov, V.Molchanov,  
E Mikheev, P. Aksenov, I.Evdokimov, M.Dye,  
Yu. Goncharov, K.Kamenov.*

**16:00-16:15 – Coffee break**

**16:15–17:30 Closing Session:**

**Conference closure: D.Tonev**

**03 – 04 October (Saturday–Sunday): Departure of participants**



**Preliminary counting:**

Overall number of proposed presentations 76 presentations  
(proposed 66 oral and 9 poster presentations)

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Session O	Opening session	4 presentations
Session 1	Fuel performance and operational experience	15 presentations
Session 2	Improvement of fuel design and operation	11 presentations
Session 3	Fuel modelling and experimental support	14 presentations
Session 4	Fuel safety and QA	6 presentations
Session 5	Spent fuel performance and management	5 presentations
Session 6	Specific issues of wwer-1000 fuel reliability	11 presentations

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66 oral presentations

Session P      Poster session                      109 presentations