



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555

December 28, 1989

NOTE TO: Jean Rathje, PDR  
FROM: Steve Salomon, SLITP/GPA  
SUBJECT: ADDITIONAL DOCUMENT TO PDR FOR US/USSR JOINT  
COORDINATING COMMITTEE FOR CIVILIAN NUCLEAR  
REACTOR SAFETY

*Steve Salomon*

Please put the following document in the PDR under "NRGUSUSR" which is the code agreed upon for the US/USSR Joint Coordinating Committee for Civilian Nuclear Reactor Safety. The document is:

Working Group Meetings, June 5-9, 1989  
Soviet Documents Transmitted to NRC Under the  
Information Exchange Provision of the Protocol  
Before the Meetings and At the Meetings

If you have any questions, please give me at call at X20368.

cc: Ed Shomaker, IP/GPA  
Lucy Kasmir, ADM/PRB

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PDR ORG NGPZ PDC

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U.S./U.S.S.R. JOINT COORDINATING COMMITTEE FOR CIVILIAN NUCLEAR REACTOR SAFETY  
WORKING GROUP MEETINGS, JUNE 5-9, 1989

SOVIET DOCUMENTS TRANSMITTED TO NRC  
UNDER THE INFORMATION EXCHANGE PROVISION  
OF THE PROTOCOL  
BEFORE THE MEETINGS  
AND  
AT THE MEETINGS

Working Group 1. Safety Approaches and Regulatory Practices

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Transmitted before the meetings.

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- 1-1 Development and Implementation of Measures to Prevent Operation of VVER-1000 Type Reactors with Positive Coolant Temperature Coefficient, and Improvement of Safety Standards Requirements - A. T. Gutsalov and M. I. Hiroshnichenko, USSR State Committee for the Supervision of Nuclear Power Safety, Moscow. (NRC Translation 2123)
- 1-2 Information on Incidents in the Operation of Nuclear Power Plant Equipment, Analysis of Materials, and Corrective Actions - no author, USSR State Committee for the Supervision of Nuclear Power Safety, Moscow. (NRC Translation 2124)
- 1-3 Supervision of Repair Work on Nuclear Power Plants - A. Yu. Davidov, USSR State Committee for the Supervision of Nuclear Power Safety, Moscow. (NRC Translation 2125)
- 1-4 Description of an Incident at the First Unit of the Zaporozhye Nuclear Power Plant, Failure of the Diesel Generator of the Standby Diesel Power Station to Start, no author, USSR State Committee for the Supervision of Nuclear Power Safety, Moscow. (NRC Translation 2126)
- 1-5 Description of an Incident at the Second Unit of the Rovno Nuclear Power Plant, Faulty Opening of the Main Safety Valve of the Pressure Equalizer, no author, USSR State Committee for the Supervision of Nuclear Power Safety, Moscow. (NRC Translation 2127)
- 1-6 Description of an Incident at the Second Unit of the Ignalina Nuclear Power Plant, Fire in Cable Mezzanine on 5 September 1988, no author, USSR State Committee for the Supervision of Nuclear Power Safety, Moscow. (NRC Translation 2128)
- 1.1 Extracts from Regulations on Organization of the Supervision Over Development of Project and Design Development Documentation for Nuclear Power Generating Facilities, Equipment, and Articles for the Latter, no author, USSR State Committee for the Supervision of Nuclear Power Safety, Moscow. (NRC Translation 2135)

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Transmitted at the meetings.

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- (a) "Decree on the State Committee for the Supervision of Nuclear Power Safety," GAEN, Moscow (1988) (NRC Translation 2154)
- (b) "Instructions on the Supervision of Safety During Operation of Nuclear Power Plants," GAEN, Moscow (1986) (NRC Translation 2155)
- (c) "Rules and Standards in Nuclear Power: Guidelines for Investigating and Reporting Violations in Operating Nuclear Power Stations," GAEN, Moscow (July 1, 1987) (NRC Translation 2156)



- (d) State Committee for the Supervision of Nuclear Power Safety, "Information and Commentary" (Newsletter), GAEN, Moscow (April 1989) (NRC Translation 2148)
- (e) "Collection and Evaluation of Information on the Level of Management of Nuclear Installations in the USSR," GAEN, Moscow, 1989 (NRC Translation 2199)
- (f) "Practice in Designing Feedback with Events Occurring at Nuclear Power Plants," A. T. Gutsalov, GAEN, Moscow, 1989 (NRC Translation 2200)
- (g) "Information Bulletin No. 1, 1989," Center of Public Information, Interdepartmental Council on Information and Communication with Society in the Field of Atomic Energy, April 1989 (NRC Translation 2201)
- (h) "Basic Conditions of Inspection Program during Period of Operation of Nuclear Power Plants," A. T. Gutsalov, et al, GAEN, June 1989 (NRC Translation 2202)
- (i) "USSR State Committee for the Supervision of Nuclear Power Safety," GAEN, June 1989 (NRC Translation 2203)
- (j) "Areas of Cooperation on the Subject: Policy and Practice of Regulatory Activity in the Area of Safety, GAEN, June 1989 (NRC Translation 2204)
- (k) "Handbook of Standards of Materials for the Safety of Nuclear Power Stations," N. V. Beskrestnov and V. I. Kononov, Energoatomizdat, Moscow, 1984-Issue 1 (NRC Translation 2197)
- (l) "Handbook of Standards of Materials for the Safety of Nuclear Power Stations," N. V. Beskrestnov and V. I. Kononov, Energoatomoizdat, Moscow 1984-Issue 2 (NRC Translation 2198)
- (m) "Rules of Nuclear Safety of Nuclear Power Stations," GKAE and GAEN, Moscow (NRC Translation 2196)

Working Group 2. Analysis of the Safety of Nuclear Power Plants in the U.S.S.R. and the U.S.

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Transmitted before the meetings.

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The Rovno Nuclear Power Plant Power Unit Number 3 Design Project--  
Feasibility Study of the Safety of Construction and Operation of the Nuclear  
Power Plant.

Note: This document was received in Moscow by NRC staff in December 1988.

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Transmitted at the meetings.

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- WG 2-1 The Principal Directional and Technical Conception of Nuclear Power with Reactors VVER-1000, Kurchatov Institute of Atomic Energy, Moscow (NRC Translation 2149)
- WG 2-2 Some Questions of Conceptions of the Nuclear Power Stations with VVER-1000 Reactors, S. A. Astakhov and G. L. Lunin, Kurchatov Institute of Atomic Energy, Moscow (NRC Translation 2150)
- WG 2-3 The Rovno Nuclear Power Station, Kurchatov Institute of Atomic Energy, Moscow (NRC Translation 2165)
- WG 2-4 Analysis of Accident and Transient Conditions in the Design of NPP with VVER-1000 Reactors, N. S. Fil and V. G. Fedorov, OKB "Gidropress, Podolst, USSR
- WG 2-5 Final Safety Analysis Report of "South Texas" NPS, Part 15 Accident Analysis, Soviet Specialists' comments
- WG 2-6 Commentary of Soviet Specialists on Volume 9, Kurchatov Institute of Atomic Energy (NRC Translation 2164)
- Note: Two Soviet reactor building drawings were transmitted - Nuclear Power Plant with High Safety VVER-1000 Reactors - Main Housing [Cross Section 1-1 and Cross Section 2-2]  
They are very large and are not included in the bound package. (NRC Translation 2170)

Working Group 3. Radiation Embrittlement of the Housing and Support Structures and Annealing of the Housings

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Transmitted before the meetings.

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- 3-1 Radiation Embrittlement of the Materials of VVER-440 Reactor Vessels from Results of Control Sample Testing - A. D. Amayev, A. M. Kruykov, and M. A. Sokolov, Kurchatov Institute of Atomic Energy, Moscow. (NRC Translation 2092)
- 3-2 Annealing Restoration of Mechanical Properties of Irradiated Materials of the VVER-440 Reactor Vessel - A. D. Amayev, A. M. Kruykov, E. P. Ryazantsev, and M. A. Sokolov, Kurchatov Institute of Atomic Energy; and V. I. Badanin, V. A. Ignatov, and V. A. Nikolaev, Central Scientific-Research Institute for Construction Materials, Leningrad. (NRC Translation 2093)
- 3-3 Influence of Fast Neutron Flux Density on Radiation Embrittlement of VVER-440 Reactor Vessel Materials - A. D. Amayev, V. I. Vikhrov, A. M. Kryukov, and M. A. Sokolov, Kurchatov Institute of Atomic Energy, Moscow. (NRC Translation 2094)
- 3-4 Scientific-Engineering Aspects Regarding the Process of Annealing of the VVER-440 Reactor Vessels and the Creation of Equipment for this Purpose - S. K. Morozov, All-Union Research Institute for Nuclear Power Plant Operations, Moscow. (NRC Translation 2131)
- 3-5 Mechanisms Determining the Dependence of Radiation Embrittlement of the Vessel Steel on Content of Its Chemical Elements - V. A. Nikolayev and V. V. Rybin, Prometey Complex Machinery Institute. (NRC Translation 2132)
- 3-6 Quantitative-Probabilistic Analysis of the Danger of Failure of Nuclear Reactor Structural Elements as a Means of Evaluating the Lifetime of These Elements Under Conditions of Incomplete and Indeterminate Initial Data on the Condition of the Facility - A. A. Tutnov and V. V. Tkachev, Kurchatov Institute of Atomic Energy, Moscow. (NRC Translation 2133)
- 3-7 Calculation of the Probability of Onset of Brittle Failure of Vessels Under Pressure - A. A. Tutnov and V. V. Tkachev, Kurchatov Institute of Atomic Energy, Moscow. (NRC Translation 2134)

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Transmitted at the meetings.

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- 3.8 Research on the Characteristics of the Weld Metal from the Reactor Vessel of Novovoronezh Nuclear Power Station, Unit 1, after 20 Years of Operation, Step 1 - A. D. Amaev, Kurchatov Institute of Atomic Energy, Moscow (NRC Translation 2152)
- 3.8-1 Study of Possible Modeling of Radiation Embrittlement of Steels for VVER Vessels - L. A. Vayner and Yu. I. Zvezdin, Soviet Atomic Energy, Vol. 66, No. 2, February 1989, pp. 86-88 (in Russian). (NRC Translation 2223)



- 3.8-2 Resistance to Brittle Failure of Austenite-Ferrite Steel Fused on to Steel 15Kh2MFA - V. I. Badanin, V. A. Ignatov, V. A. Nikolayev, V. V. Rybin and B. T. Timofeyev, USSR Academy of Sciences, Moscow, Automatic Welding, 1989, No. 3, pp. 4-7 (in Russian). (NRC Translation 2225)
- 3.8-3 Reduction of Fracture Toughness of a Low-Alloy Steel During Irradiation - V. A. Nikolaev, V. F. Vinodurov, A. M. Morozov, V. S. Panteleev, and V. K. Shamardin, Soviet Atomic Energy, Vol. 62, No. 5, May 1987, pp. 400-403.
- 3.8-4 Effect of Neutron Irradiation and Corrosive Medium on the Crack Resistance of the Water-Moderated Power Reactor Vessels - L. A. Vainer, Soviet Atomic Energy, Vol. 62, No. 5, May 1987, pp. 404-407.
- 3.8-5 Solidus Criteria for the Binding Energy of Vacancies with Impurity Atoms - V. A. Nikolaev, Journal of Technical Physics, Vol. 56, No. 4, 1986, pp. 776-778 (in Russian). (NRC Translation 2194)
- 3.8-6 Effect of Defect Annealing of Hydrogen Absorption in Neutron Irradiated Iron Alloys - V. A. Nikolayev and S. V. Shapovalov, USSR Academy of Sciences, Moscow. Physics of Metals and Metallography, Vol. 61, April 1986, pp. 822-824 (in Russian). (NRC Translation 2224)
- 3.8-7 Damage Summation in Annealing and Repeated Irradiation of Pressure-Vessel Steel - V. A. Nikolaev, V. I. Badanin, and A. M. Morozov, Soviet Atomic Energy, Vol. 57, No. 3, Sept. 1984, pp. 603-606.
- 3.8-8 Effect of Chemical Composition and Annealing Conditions on the Radiation Embrittlement of the Metal of Low-Alloy Welded Seams - V. A. Nikolaev, A. M. Morozov, V. I. Badanin, A. S. Teshchenko, and R. P. Vinogradov, Soviet Atomic Energy, Vol. 57, No. 3, Sept. 1984, pp. 606-613.

Working Group 4. Fire Safety

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Transmitted before the meetings.

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- 4-1 Fire Safety and Practical Design of Nuclear Power Plants, A. K. Mikeev, Main Fire Department, Ministry of Interior. (NRC Translation 2095)
- 4-2 Organization for Fire Fighting at Nuclear Power Plants, A. K. Mikeev, Main Fire Department, Ministry of Interior. (NRC Translation 2096)
- 4-3 Problem of Hydrogen Safety in Nuclear Engineering, V. I. Mikeev, V. V. Strogonov and I. A. Bolodyan, All-Union Research Institute for Fire Protection. (NRC Translation 2097)
- 4-4 Assurance of Fire Safety of Cable Equipment, A. Ya. Korolchenko and G. I. Smelkov. All-Union Research Institute for Fire Protection. (NRC Translation 2098)
- 4-5 Principles Governing the Formation and Combustion of Local Hydrogen-Air Mixtures in a Large Volume, Yu. N. Shebeko and S. G. Tsarinchenko, All-Union Research Institute for Fire Protection. (NRC Translation 2099)
- 4-6 Protection of Nuclear Power Plant Areas Against Smoke, A. Ya. Korolchenko and V. M. Yesin, All-Union Research Institute for Fire Protection. (NRC Translation 2100)

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Transmitted at the meetings.

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- 4-7 Overview of the 4 following charts Fire Department, Ministry of Interior. (not translated, in Russian only)
- 4-8 I. Design (Note: Charts I,II, III, and IV, are contained in NRC Translation 2227)
- 4-9 II. Construction and Assembly Work
- 4-10 III. Acceptance for Facility for Operation
- 4-11 IV. Operation
- 4-12 Basic Required Standards for Premises Containing VVER-1000 Reactors, Fire Department, Ministry of Interior. (NRC Translation 2228)



Working Group 6. Severe Accidents

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Transmitted before the meetings.

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- 6-1 Dynamic Reactor Testing of Fuel-Releasing Elements as Substantiation of the Safety of Atomic Power Under Emergency Conditions, V. G. Asmolov, L. A. Ygorova, V. A. Pavshuk, V. Y. Khvostionov, and A. D. Vyrin, Kurchatov Institute of Atomic Energy. (NRC Translation 2101)
  - 6-2 Simulation of Escaping of Fission Products from the Fuel of Nuclear Power Facilities, Y. G. Basanskiy, A. G. Bondarenko, N. A. Kydryashov, and Yu. I. Sytsko, All-Union Research Institute for Nuclear Power Plant Operations. (NRC Translation 2102)
  - 6-3 Investigation of the Behavior of Iodine and Formation of Organic Compounds During Serious Accidents, V. A. Kvukhimenny, Ue. M. Klement'yeva, O. M. Kovalevich, V. F. Fedulov, L. M. Puzanova, O. Ya. Shakh, and N. F. Repnikov, Kurchatov Institute of Atomic Energy, Moscow. (NRC Translation 2129)
  - 6-4 System of Containment Shell Depressurization and Filtration of Released Radioactive Products in the Event of Serious Accidents at Nuclear Power Plants with VVER-1000 Type Reactors, V. G. Asmolov, N. N. Ponomarev-Stepnov, and O. Ya. Shakh, Kurchatov Institute of Atomic Energy, Moscow. (NRC Translation 2130)
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Transmitted at the meetings.

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- 6-5 Software Complex for Mathematical Analysis of Severe Accidents, V. G. Asmolov, A. I. Mysenko, and V. N. Kalinenko, Kurchatov Institute of Atomic Energy. (NRC Translation 2195)

Working Group 8. The Exchange of Operational Experience

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Transmitted before the meetings.

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- 8-1 The Information System on Nuclear Power Plant Operating Disturbances of the U.S.S.R. Ministry of Atomic Energy, V. M. Vitkov, Yu. K. Zhuk, and S. A. Lesnoy, All-Union Research Institute for Nuclear Power Plant Operations, Ministry of Atomic Energy. (NRC Translation 2103)
- 8-2 Experience in Development and Use of a National Information System on Reliability of Nuclear Power Plant Equipment, B. A. Kochanov, S. A. Lesnoi, and A. I. Fandeyev, All-Union Research Institute for Nuclear Power Plant Operations. (NRC Translation 2104)
- 8-3 Software of the National Information System on Nuclear Power Plant Safety and Reliability, E. S. Alekseeva, A. V. Goncharov, I. V. Ritter, A. R. Khachaturov, and A. A. Shikhov, All-Union Research Institute for Nuclear Power Plant Operations. (NRC Translation 2105)
- 8-4 Operating Experience of Atomic Power Plants Units in 1987. Un-scheduled Shut-downs and Load Shedding of the Units, S. A. Lesnoy, V. M. Vitkov, and A. I. Borovkov, All-Union Research Institute for Nuclear Power Plant Operations. (NRC Translation 2106)
- 8-5 Procedural Instructions for Determination and Analysis of Actual Underutilization of the Installed Electrical Capacity at Nuclear Power Plants, M. S. Isaev, A. A. Kozenyuk, I. N. Petrova, All-Union Research Institute for Nuclear Power Plant Operations. (NRC Translation 2107)

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Transmitted at the meetings.

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- 8-6 Survey Breakdown in the Operation of Nuclear Power Stations with VVER-440 Reactors of the Ministry of Nuclear Power in the USSR for the Years 1987-1988, A. I. Borokov, A. L. Gorshkov and S. A. Lesnoy, All Union Research Institute on Nuclear Power Plant Operations, Moscow. (NRC Translation 2153)

Working Group 10. Erosion/Corrosion Destruction of Piping and Components

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Transmitted before the meetings.

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- 10-1 Corrosion of Structural Materials in the Condensate Circuits at the RBMK Plants, I. A. Stepanov, V. N. Belous, and V. N. Baranov, Research and Development Institute of Power Engineering, Moscow.
- 10-2 Experimental and Theoretical Investigations of the Influence of Water Chemistry Regime on Erosive/Corrosive Wear, B. I. Nigmatulin and M. G. Saltanov, All-Union Research Institute for Nuclear Power Plant Operations. (NRC Translation 2108)
- 10-3 Physicochemical Basis of Modeling of the Composition of the Aqueous Heat Transfer Agent of a Nuclear Power Plant, V. M. Sedov, L. V. Puchikov, V. G. Kritskiy, and V. I. Zarembo, Power Technology Institute. (NRC Translation 2109)
- 10-4 Thermodynamic Model of the Behavior of Corrosion Products of Basalt in the Circuit of a Nuclear Power Plant with Boiling Water Reactors, V. I. Zarembo, V. G. Kritskiy, L. V. Puchkov, and A. A. Slobodov, Power Technology Institute. (NRC Translation 2110)
- 10-5 Solubility of Magnetite in the Heat Transfer Agent of a Nuclear Power Plant with a Boiling Water Reactor, V. I. Zarembo, B. G. Kritskiy, A. A. Slobodov, and L. V. Puchkov, Power Technology Institute. (NRC Translation 2111)
- 10-6 The Fundamental Dependence of Corrosion Erosion of Carbon Steels in the Water Circuits of Power Plants on Thermodynamic Factors of Equilibrium, V. I. Zarembo and V. G. Kritskiy, Power Technology Institute. (NRC Translation 2112)
- 10-7 Influence of the Concentration of Dissolved Oxygen on the Behavior of Corrosion Products Dispersed in the Coolant of a Boiling Water Reactor, A. A. Yefimov, V. G. Kritskiy, L. N. Moskvina, A. I. Gorshkov, N. A. Durkhisyanov, N. G. Katkov, B. A. Gusev, V. T. Korotkov, and A. S. Korolev, Power Technology Institute. (NRC Translation 2113)
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Transmitted at the meetings.

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- USSR/3 Release of Corrosion Products from the Surface of Steel in the Coolant Water of an Atomic Power Plant - V. G. Kritskii, A. S. Korolev, I. G. Berezina and M. V. Sof'yan, Power Technology Institute, Moscow. Soviet Atomic Energy, Vol. 59, No. 6, Dec. 1985, pp. 401-403 (in Russian) (NRC Translation 2157)
- USSR/5 Magnetite Solubility in the Regeneration Medium in Atomic Power Plant Water at Elevated Temperatures - V. I. Zarembo, V. G. Kritskiy, L. V. Puchkov and A. A. Slobodov, Power Technology Institute, Moscow. Soviet Atomic Energy, Vol. 64, No. 3, March 1988, pp. 225-227 (in Russian) (NRC Translation 2158)



- USSR/6 Solubility of Corrosion Products of Steels in Power Units that Model Various Water-Chemical Regimes - A. A. Slobodov, V. G. Kritskii, V. I. Zarembo and L. V. Puchkov, Power Technology Institute, Moscow, Journal of Applied Chemistry, Number 12, 1988, pp. 2261-2667 (in Russian). (NRC Translation 2193)
- USSR/7 Behavior of Copper Corrosion Products in the Water Loops of Power Plants - V. I. Zarembo, V. G. Kritskii, A. A. Slobodov and L. V. Puchkov, Journal of Applied Chemistry, Number 1, 1989, pp. 71-74 (NRC Translation 2159)
- USSR/8 Experimental Research on the Influence of Hydrodynamics and Physical and Chemical Properties of Water Media with High Parameters on the Process of Appearance and Development of Erosion and Corrosion Destruction - B. I. Nigmatulin, I. N. Goryackin, and M. G. Saltanov, All-Union Research Institute for Nuclear Power Plant Operations, Moscow. (NRC Translation 2160)
- USSR/9 Criteria for Determining Permissible Size of Defects in Pipes, author unknown. (NRC Translation 2161)
- USSR/13 Electrochemical Methods for Corrosion Studies at Nuclear Power Plants, author unknown. (diagrams and figures) (NRC Translation 2162)
- USSR/14 On Principal Relationship between Power Plant Stainless Steel Loop Corrosion-erosion and Thermodynamic Equilibrium Factors, V. G. Kritsky and V. I. Zarembo, Power Technology Institute.
- USSR/15 Corrosion Products Release from Steel Surface Into BWR Water Coolant, V. G. Kritsky, A. S. Korolev, I. G. Berezina and M. V. Sofyin, All-Union Scientific Research and Planning Institute of Complex Power, Leningrad.

Note: USSR/1 was reclassified as WG 3-6, USSR/2 is 10-7, USSR/4 is 10-6, USSR/10 is 10-5, USSR/11 is 10-4, USSR/12 is a bad copy and was not translated and is also believed to be of low priority.