CVS
Profile

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CKTI-VIBROSEISM (CVS) PROFILE

CVS, is a focused, specialized engineering firm offering structural and mechanical analysis to diverse clients across Russia, CIS and abroad. Our range of services is primarily designed to complement or extend the structural-mechanical design, analysis testing, software design, dynamic, vibration and seismic qualification and isolation of systems, piping and equipment.

Established more than 20 years ago as the first in former USSR State Seismic Protection Laboratory (VSL) CVS is a full private partnership company now, with practically the same staff members. The organization has remained small - we currently have a little over two dozen professionals and support personnel. Our size enables us to respond to clients' needs quickly and on a very individual, focused basis. Among our client list are internationally known leaders in energy, chemical, machinery and other primary industries. It also includes noted government and international agencies and laboratories.

CVS was founded as a specialized, highly flexible and responsive engineering firm. We have gained extensive experience and wide professional recognition but our original purpose, our commitment to client's needs and professional responsibility, remains paramount.

SCOPE OF SERVICES

CVS has accumulated extensive professional experience in all aspects of structural-mechanical activities related to the nuclear and fossil power field. From 1978 our firm has been heavily involved in nuclear, fossil power and chemical industry and in the analysis, testing and protecting structures, systems, piping and equipment from seismic, operational vibration and other extreme and accident dynamic loads. It has gained now experience in preparation and performing walkdowns according demands of SQUG, GIP and realization of nonlinear analysis of systems in the frame of Seismic Margin Assessment (SMA), High Confidence Low Probability of Failure (HCLPF) and Conservative Deterministic Failure Margin (CDFM) methods. All kinds of analysis can be performed according to national and international standards like PNAE CIS Code, ASME Code, IAEA Guides, etc.

Services range from criteria development to detailed analysis, design and testing of new/existing plant structures, mechanical and electrical equipment, piping and distribution systems including delivering of High-Viscous Dampers for seismic and dynamic isolation.

Within the area of PWR/BWR (VVER/RBMK) and FPP commercial plants, specific specialty areas include:

- Finite Element Analysis of Structures and Components, specifically equipment, piping, rotating machines and systems of Power Plants;
- Dynamic Load Vibration Control Analysis and Testing;

- Seismic Margin Analysis
- Impact and Impulsive Load Analysis;
- High Energy Line and Piping Break Analysis;
- Nonlinear and High Temperature Analysis;
- Fatigue and Service Life Limit Analysis;
- Seismic Spectra Development and Regeneration;
- Normal and Extreme Load Analysis, including powerful turbines;
- Design of Vibro-Isolation Systems;
- Shaking Tables Testing in the Range from 10 up to 300 ton Weight Capacity;
- Software Development and Upgrading for Nonlinear Dynamic Analysis;
- Delivering and Installation of High-Viscous Dampers;
- Walkdown Services for the GIP Programs.

All kinds of above mentioned specific services have been performed for a wide range of structures, piping and equipment components. More than 500 units of CVS High-Viscous Dampers are now working on a number of NPP and FPP providing full isolation from operational vibration, dynamic/hammer impacts, seismic and extreme loads.

CLIENT LISTING

CVS engineers have provided consulting services to clients throughout the energy related mechanical and chemical industries. A partial listing of these clients includes:

Cola NPP, Russia
Ignalina NPP, Litva
Kalinin NPP,Russia
Novo-Voronez NPP, Russia
Kurskaya NPP, Russia
Zaporogie NPP, Ukraine
South-Ukranian NPP, Ukraine
Leningrad NPP, Russia
V.S Summer NPP, USA
WAPP NPP, USA
Skoda, Praha, Czech Republic

Rovenskaya NPP, Ukraine
Kozloduy NPP, Bulgaria
Belene NPP, Bulgaria
Armenian NPP, Armenia
Mochovze NPP, Slovakia
Bougunize NPP, Slovakia
Loviisa NPP, Finland

Dukovany NPP, Czech Rep.
Temelin NPP, Czech Rep.
Paks NPP, Hungary
Balakovo NPP, Russia
Bilibino NPP, Russia
Beloyarskaya NPP, Russia
Razdan FPP, Armenia
Azerbadjan FPP, Azerbadjan
Tumen FPP, Russia
Zcisyan FPP, China
Skoda, Plzen, Czech Republic

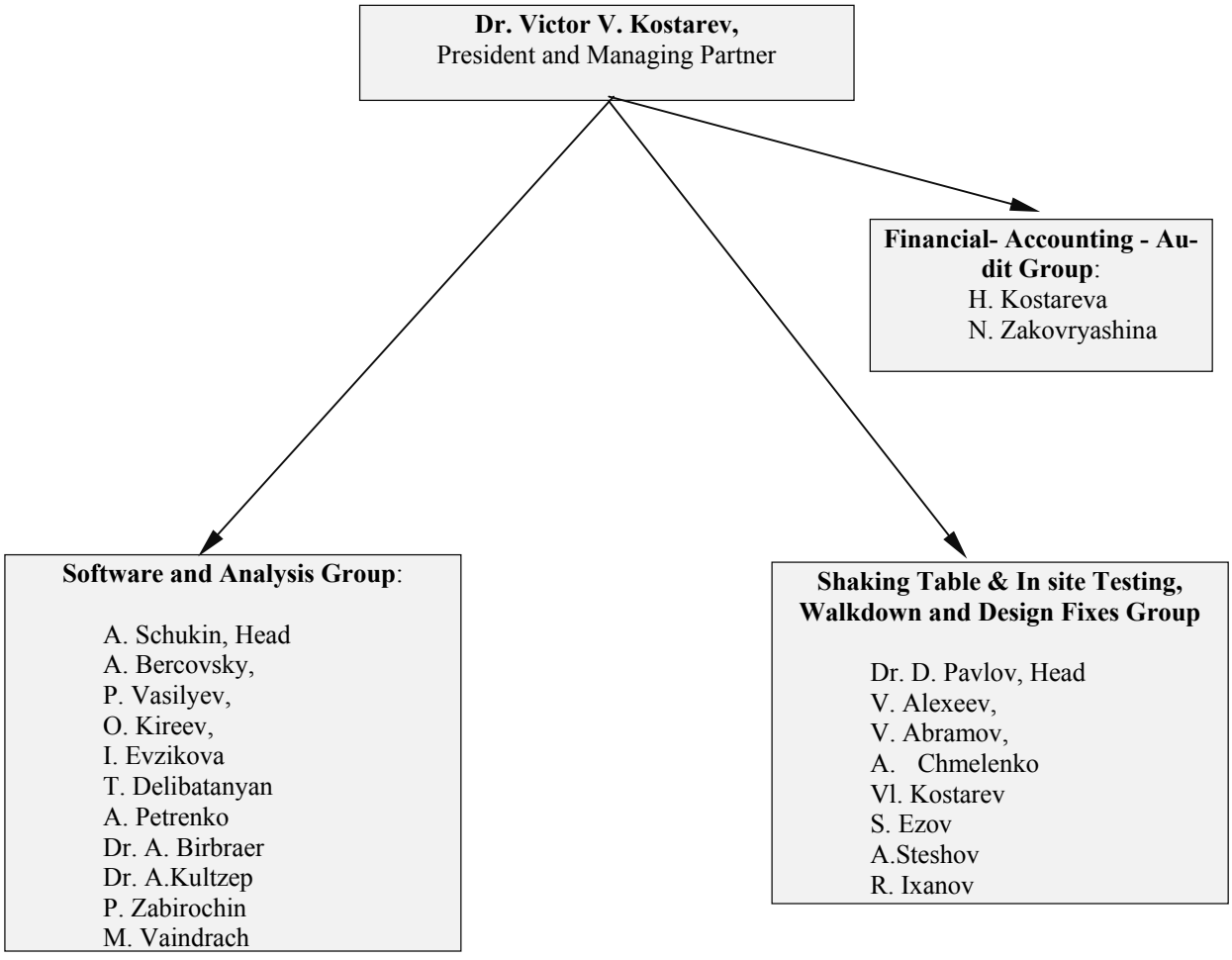
Mutnovskaya FPP, Russia
Imin FPP, China
Ramin FPP, India
Nairit Chemical Co., Armenia
TurboAtom Co., Ukraine
LMZ TURBO Co., Russia

IHI Company, Japan
S&A, USA
S&A, Czech
IAEA, Vienna Austria
GERB Co., Germany
UTMZ Turbo Co., Russia
Kirovsky Plant, SPb Russia
TEC 14, SPb Russia
TEC 15, SPb Russia
South FPP, SPb Russia
Modranska Potrubni, Czech Republic
OKB Hydropress, Russia
ZIO Boiler Co., Russia.
Taganrog Boiler Co., Russia
Belgorod Boiler Co., Russia
AEP Institutes, Russia
Izora Nuclear Industry, Russia

CVS STRUCTURE AND PERSONNEL PROFILES

CVS engineering staff has an extensive worldwide experience in upgrading of reliability and dynamic and seismic capacity of NPP and FPP facilities.
Dr. Victor V. Kostarev has more than 30 years of professional experience and other key engineers more than ten years each. At the same time the average age of the engineering staff is under 40, which means the sum of experience and fast reaction to the clients' needs.

CVS STRUCTURE
(Principal Staff Members)



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PARTIAL CVS CONTRACT LIST

PURCHASER	CONTRACT	YEAR
Balakovo NPP	Reduction of intensive vibration of rejecting collectors and safety valves of the main steam piping system	2000
Paks NPP	Upgrading of dynamic and seismic capacity of the secondary side piping	2000
Loviisa NPP	Elimination of vibration of steam and fead-water pipelines inside containment	2000
Loviisa NPP	Elimination of vibration of steam and fead-water secondary side pipelines	1999
Moscow AEP	PSAR and design basis for protection of NPP Bushier against piping rupture	1998
SPb AEP	PSAR and design basis for protection of NPPin China against piping rupture	1998
SPb AEP, Russia	Analysis of vibro-isolation system with high viscous dampers for turbo-generator of Lyanyungan NPP China	1998
Mochovze NPP, Slovakia	Seismic analysis of primary loop system	1997
SPbAEP	Consulting and HELB analysis for NPP Mochovze	1997
Bohunize NPP, Slovakia	Design of support system of high energy piping for Units 1 and 2	1997
Paks NPP, Hungary	Seismic analysis of safety related piping of Units 1 to 4.	1997
Kalinin NPP, Russia	Vibration analysis and vibration elimination of safety related piping TQ 11, 2TH 11, 2TQ 12, 2TH 12, 2TQ 13, 2TH 13 by means of high viscous dampers	1996
GERB Co., Germany	Consultant Engineering Services for application of HVD in various systems and specific cases	1996
OKB “GYDRO-PRESS”, Russia	Development of software for dynamic analysis of VVER NPP primary systems with high viscous dampers. Analysis of PCLS on extreme loads	1996
“Stevenson and Associates”, USA-Czech Republic	Seismic analysis and dynamic upgrading of safety related piping, equipment and systems of Temelin, Mochovze, Paks, Bohunize and Dukovany NPPs	1996
Risk Eng., Bulgaria	Seismic analysis of PCLS and safety related piping of 1 and 2 classes for Unit # 3 Kozloduy NPP	1996
“S&A”, Russia	ASME Code Service Level D Seismic analysis of the main 1st and 2nd class piping in containment for VVER-1000 Temelin NPP Unit in Czech Republic	1995
Moscow AEP, Russia	Comparative seismic analysis of VVER-1000 NPP PCLS using ASME and PNAE Codes	1995
NPP “Kozloduy”, Bulgaria	Walkdown of safety related systems	1994

Cola NPP, Russia	Developing, manufacturing, assembling and in-site testing of HVD damping supports for vibration elimination of safety related piping	1994
Cola NPP, Russia	Design, delivery and testing of HVD damping supports for feed-water systems of the primary part of Unit # 1 Cola NPP	1994
"WAPP" NPP, USA	Installation of High Viscous Dampers for vibration protecting of safety piping	1994
GERB Co., Germany	Software development for dynamic analysis of systems with high viscous dampers	1994
NPP B-2 Bohunize, Slovakia	Seismic Margin Analysis for 1st and 2nd class piping	1994
"S&A", Czech Republic	Seismic Margin Analysis of S class piping of Unit #1 VVER-440-213 NPP B-2	1994
NPP "Paks", Hungary	Seismic Margin Analysis of 1st and2nd class piping	1993
NPP "Paks", Hungary	Seismic Walkdown	1993
NPP "VC SUMMER S.C.", USA	Vibration walkdown of safety related piping	1992
NPP "Kozloduy", Bulgaria	Seismic and vibration analysis of VVER-440 Turbo-Generator Set	1989
"Izora" Plant, Russia	Shaking Table Experimental study of Control Rod Drive System seismic capacity for VVER–440 reactor	1987
NPP "Kalinin", Russia	Installation of HV dampers for piping vibration protection	1987
NPP "Cola", Russia	Installation of HV dampers for piping vibration protection	1987
NPP "South-Ukraine", Ukraine	Analysis and experimental study of secondary part systems	1987
NPP "Kozloduy", Bulgaria	Seismic analysis of K-1000-60/1500-4 turbo-generator	1986
NPP "Rovno", Ukraine	Analysis and experimental study of secondary part systems	1986
"Izora" Plant, Russia	Shaking Table Experimental study of Control Rod Drive System and Volume Compensatory Vessel seismic capacity for VVER–440 reactor	1981
"Izora" Plant, Russia	Shaking Table Experimental study of LSP Control Rod Drive System seimic capacity for VVER–1000 reactor	1979
NPP "Novovoronez", Russia	In-site Dynamic Experimental study of LSP Control Rod Drive System for VVER–1000 reactor	1979

PARTIAL CKTI-VIBROSEISM REFERENSES

1. Regulatory Guide 108.020.37-81 with Addenda # 1. Equipment and Piping of Nuclear Power Plants. Seismic Analysis. NPO CKTI (V.Kostarev, A. Shukin, V.Vetoshkin), SPb, 1986. (in Russian)
2. Patent SU 1689693 A1/ F 16 F 9/06 # 4327613/28 Visco-Elastic Damper, D.Pavlov, V.Kostarev, et.al., 17.11.1987.
3. Pavlov D.J., Reynov A.M. Aseismic Restraining Devices for NPP Equipment and Piping. "Energomachinostroenjie", # 9, 1987, p.p. 33-35.
4. Ochi Y., Kashiwazaki A., Kostarev V.V. (1990). Application of High Viscous Damper on Piping System and Isolation Floor System, Proc. of 9 ECEE, Moscow.
5. Kostarev V.V., Pavlov D.J. CKTI- Damper – a New Way for Solving the Problem of Protection of Piping System, Equipment and Constructions Against Dynamic and Seismic Impact. Proc. of 9 EAEE, vol. 3, EAEE, September, 1990, Moscow, Russia.
6. V.V.Kostarev, D.J.Pavlov, et. al. Application of CKTI Damper for Protecting Piping Systems, Equipment and Structures Against Dynamic and Seismic Response.
   SMIRT 11 Transactions, Vol. K, Tokyo, Japan, 1991, p.p. 505-510.
7. V.V. Kostarev. Upgrading of seismic Capacity of VVER Equipment Including Reactor Control Rods and Distribution Systems. Working Material.
   SMIRT Post Conference Seminar, IAEA, Vienna, 1993.
8. V. Kostarev, A. Berkovski, et. Al.. Application of mathematical model for high viscous damper to dynamic analysis of NPP piping. Proc. of 10th ECEE, 1994, Vienna, Austria.
9. A. Berkovski, V. Kostarev, et. al.. Seismic Analysis of VVER NPP primary coolant loop with different seismic devices. Transactions of SMIRT 13, Porto Alegre, Brazil, 1995.
10. A. Berkovski, et. al. Seismic analysis of the safety related piping and PCLS of the VVER-440 NPP. Transactions of the 14th SMIRT, Lyon, France, August 1997.
11. V.Kostarev, et.al. Upgrading of Dynamic Reliability and Life Extension of NPP Piping by means of HVD Technology. (K634-1). Transactions of 14th SMIRT Conference, Lyon, France, August 1997
12. V. Kostarev, A. Berkovski, A. Schukin. Aseismic Design and Analysis of the Primary Coolant Loop and Safety Related Piping Systems of Russian Design NPP WWER-440. Transactions of PVP ASME Conference, Boston 1999
13. V. Kostarev, A. Berkovski, A. Schukin. Upgrading of dynamic reliability and life extension of piping by means of high viscous damper technology. Transactions of PVP ASME Conference, Boston 1999
14. J.Stevenson A.Berkovski, O.Kireev, V.Kostarev. Analysis of non-classically dampened structures, methodology and practical results. Transactions of PVP ASME Conference, Seattle, 2000
15. Костарев В.В., Павлов Д.Ю., Алексеев В.Н. Повышение динамической

надежности и продление срока службы трубопроводов при использовании технологии высоковязкого демпфера. Журнал «Тяжелое Машиностроение", № 8, 2000.

16. V. Kostarev, V. Fomin, K-H. Reinsch Elimination of Power Capacity Limitation due to Main Piping Operational Vibration of the Chernobyl NPP Unit 3 in order to Burn Out Fuel before Final Shutdown. SMIRT 16, Division J # 1375, Wachington D.C., 2001

CURRICULUM VITAE

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1. Family name: KOSTAREV

2. First name: VICTOR

3. Date of birth: 19 May 1945

4. Nationality: Russian

5. Civil status: Married

6. Education:

Institution	St. Petersburg Technical University, Russia
Date: from (month/year) to (month/year)	09/1962 04/1968
Degree(s) and Diploma(s) obtained:	Mechanical Engineer, 1968 Dr. of Mechanical Engineering, 1979 Senior Researcher in Structural Mechanics, 1982 EDP Manager, EDP Center, USA, 1991

7. Language skills: (Mark 1 to 5 for competence):

Language	Reading	Speaking	Writing
Russian	5	5	5
English	5	5	4

8. Membership of professional bodies:

- American Society of Mechanical Engineers (ASME),
- SMA and Verification Group of Russian Nuclear Regulation Committee,
- Earthquake Engineering Research Institute, Oakland CA, USA
- MSSS NPP Committee of Russian Academy of Science,

9. Other skills:
- computer literacy.

10. Present position:

President and Managing Partner of CKTI-VIBROSEISM Co., Ltd.

11. Years within the firm: 6

12. Key qualification: (relevant to the Contract)

- Team Leader/Project manager of a numerous programs and contracts for seismic and dynamic upgrading of VVER and RBMK type NPPs
- IAEA expert
- Special training course for seismic qualification of NPP structures, systems and equipment components using experience data, May 1996
- SQUG Training Course, September 1993
- EDP Managing Course, 1991
- Special Training Course for BPVC ASME 1998, October 1998

13. Specific VVER and NPP experience:

Mr. Kostarev was involved as a Team Leader and Manager in a number of projects for Walkdowns, SMA, Seismic, Dynamic and HELB upgrading of existing and new design of Nuclear Plants. Among them are:

Cola NPP, Russia	Dukovany NPP, Czech Rep.	IHI Company, Japan
Ignalina NPP, Lithuania	Temelin NPP, Czech Republic	S&A, USA
Kalinin NPP, Russia	Paks NPP, Hungary	S&A, Czech
Novo-Voronez NPP, Russia	Balakovo NPP, Russia	IAEA, Vienna Austria
Kurskaya NPP, Russia	Bilibino NPP, Russia	GERB Co., Germany
Zaporogie NPP, Ukraine	Beloyarskaya NPP, Russia	Dodware NPP, Holland
South-Ukranian NPP, Ukraine	OKB Hydropress, Russia	V.S Summer NPP, USA
Leningrad NPP, Russia	Bougunize NPP, Slovakia	WAPP NPP, USA
Armenian NPP, Armenia	Belene NPP, Bulgaria	Mochovze NPP, Slovakia
Rovenskaya NPP, Ukraine	Kozloduy NPP, Bulgaria	Izora Plant, Russia
Loviisa NPP, Finland	LyanYung Gan NPP, China	Kudankulam NPP, India

14. Professional Experience Record

Date: from (month/year) to (month/year)	Location, Company, Position, Description
05/92 to present	St. Petersburg, Russia, CVS, President and Managing Partner Review and evaluation of design adequacy of NPP&FPP systems, piping and equipment components on impacts of extreme loads.
01/78 to 05/92	St. Petersburg, Russia, Central Boiler and Turbine Institute, Chief of the Laboratory for NPP and FPP Vibration and Seismic Stability (VSL). Foundation of VSL. Seismic and Dynamic upgrading of NP and FP Plants. Shaking Table and In Site testing and qualification of NPP components. Dy-

	namic Analysis.
04/68 to 01/78	St. Petersburg, Russia, Central Boiler and Turbine Institute, Laboratory of Turboset Vibration, engineer, senior researcher. Vibration testing, qualification and dynamic analysis of turbines 250-1000 Mwt power capacity. Upgrading of HP rotors stability using new types of bearings and sealing.

15. Awards:

1. The Gold medal of All Union (USSR) Exhibition, 1975
2. The “Best Professionals in USSR Energetic” Award, 1985

16. Others:

Publications:

1. Investigation and Elimination of Low - Frequency Vibration of K-300-240 Turbine. "Transaction of CKTI", Vol. 100, 1970, p.p. 247-256 .

2. Upgrading of Vibration Stability of Powerful Turbines Rotors. Abstracts of USSR Conference "The Problems of Turbo-Generator Vibration", VDNCH, 1972, p.p. 18-19.

3. Investigation of High Pressure Rotor Bearings of Powerful Steam Turbines. "Transaction of CKTI", Vol. 14, 1972, p.p. 78-84.

4. The Aerodynamic Excitation of Low-Frequency Vibration of High Pressure Steam Turbines Rotors. "Transaction of CKTI", Vol. 124, 1974, p.p. 9-14.

5. The Stage of Axial Turbine. USSR Patent No. 380848, 1973.

6. The Main CKTI Results in Upgrading of' “Turbogenerator – Foundation - Soil" System Reliability for Powerful Energetic Installations. USSR Conference "Upgrading of TFO System Reliability", USSR Ministry of Energy, Moscow, 1975, p.p. 12-14.

7. The Matters of Elimination of Low-Frequency Vibration of Powerful Turbogenerators. "Energetic", No. 5, 1975, p.p. 41-46.

8. The Experimental Study of Dynamic Characteristics ofK-500-240-2 Turbine TFO System. "Transaction of CKTI", Vol. 143, 1976, p.p. 27-31.

9. Dynamic Loads to Rotor Supports of Powerful Turbogenerators. "Energy", No. 109, 1976, p.p. 66-69.

10. The Experimental Study of TFO System Foundation Dynamic Characteristics. "Energy", No. 109, 1976, p.p. 35-41.

11. Guide for Elimination of Energetic Turbines Rotors Low-Frequency Vibration. CKTI Special Edition, 1976, p. 21.

12. Generalization of Experience for Elimination of Energetic Turbines Rotors Low-Frequency Vibration. "Transaction of CKTI", Vol. 155, 1978, p.p. 11-18.

13. Experimental Study of Anti-vibration Properties of Powerful Turbines Bearings. "Transaction of CKTI", Vol. 158, 1978, p.p. 19-26.

14. Hydrostatic Support in Tilting Pad Bearing. "Energomachinery", No. 6, 1978, p.p. 32-34.

15. The Facility for Testing of Radial Bearings. USSR Patent No. 646211.

16. The Algorithm and Program for Analysis of Complex Dynamic Systems on Random Seismic Impact. "Transaction of CKTI", Vol. 182, 1980, p.p. 111-116.

17. Experimental Study of Control Rod SUZ Seismic Stability. "Transaction of CKTI", Vol. 182, 1980, p.p. 117-122.

18. Energetic Equipment of Power Plants with VVER Type Reactor. Structural Analysis under Seismic Excitation. Guide RTM 108.020.37-81. USSR Ministry of Energomachinery. Special
CKTI Edition, 1981, 39 p.

19. The Peculiarities of the Guide for Seismic Analysis of WER NPP Equipment. "Energomachinery", No. 8, 1983, p.p. 24-25.

20. The Steel Frames for Energetic Boilers. Analysis Guide RTM 108.031.09-83. CKTI Special Edition, 1984,52 p.

21. Seismic Margin Analysis of Vertical Steam Generator PGV-250. "Transaction of CKTI", Vol. 190,1982, p.p. 32-36.

22. The Matters of Practical Usage of Modern Methodology for Seismic Analysis of Energetic Equipment. "Transaction of CKTI", Vol. 212, 1984, p.p. 3-13.

23. The Seismic Stability of NPP Turbogenerators. "Transaction of CKTI", Vol. 212, 1984, p.p. 82-87.

24. The Nonlinear Seismic Margin Analysis of the Railway Platform for Transportation of NPP Fuel as the Elastic-Gravity System. Abstracts of USSR Conference "Structural Integrity and Seismic Stability of Energetic Equipment (SISSEE)", Frunze, Kirgiziya, 1985.

25. The Synthetic Model of Seismic Excitation for Seismic Analysis of Energetic and Industrial Facilities. Abstracts of USSR Conference "SISSEE", 1985.

26. The Experience of Anti-seismic Design of NPP and FPP Equipment. Abstracts of USSR Conference "SISSEE", 1985.

27. The Problems of Anti-seismic Analysis and Design of NPP and FPP Equipment. Abstracts of USSR Conference "Experimental and Analytical Methods of Anti-seismic Design for Hydro and Power Stations (NIRSS-81)", Narva, Estonia, 1981.

28. Principles of Aseismic Design of Atomic Power Plants. "Special Meeting of ground motion and anti-seismic design of NPP" (SMGMAD of NPP), USSR, Moscow, 20-28.03.1986, IAEA, Vienna, 1986.

29. Seismic Safety of NPS First Loop with Water Cooled Reactors. "SMGMAD ofNPP", USSR, Moscow, 20-28.03.1986, IAEA, Vienna, 1986.

30. The Regimes of NPP Turbines. "Energoatomizdat", Moscow, 1986.

31. RTM Guide 108. 021.102-85. Energetic Turbines. Demands to Foundation. NPO CKTI, 1986,16 p.

32. The Thermo - Deairator. Patent of Russia No. 1250773, 15.04.1986.

33. RTM Guide 108. 020. 37-81. The Equipment of NPP. Strength Analysis under Seismic Excitation. Special Edition with Addenda No. 1. NPO CKTI, 1986, 36 p.

34. RTM Guide 108.031.114-85. Energetic Boilers. The Guide for Strength Analysis under seismic Excitation. Special Edition. NPO CKTI, L. 1986, 57 p.

35. Experience of Energetic Equipment Anti-seismic Design using Synthetic Seismic Wave. Abstracts of Inter Ministry Seminar "Seismic Stability of NPP Equipment" (SSNE), Nalchik, 01- 07.09.1986.

36. Snubbers with High Viscous Liquid for Upgrading Seismic and Vibro Stability of Energetic Equipment. Abstracts of Inter Ministry Seminar "SSNE", Nalchik, 01-07.09.1986.

37. Strength and Service Life of Energetic Equipment. "Transactions of CKTI", Jubilee Edition, 1988.

38. Visco-Elastic Hydro-Snubber, Patent of Russia, No. 4265601/25-28, 22.06.87.

39. Visco-Elastic Damper, Patent of Russia, No. No. 4327613/ 25-28, 17.11.87.

40. Comparative Seismic Analysis of Energetic Equipment Test Models. "Energomachinery", No. 8,1988, p.2.

41. Methodology of Power Equipment Seismic Analysis. "Energomachinery" No. 8, 1987, p.3.

42. Protecting of Structures, Equipment and Piping from Seismic Loads. ALL-Union Seminar
"Problems of Structural Mechanics and Seismic Stability of Energetic Equipment", 01-07.09.1989, Frunze, FPI.

43. Visco-Elastic Damper. Patent of Russia No. 89/00058, 07.03.89.

44. Seismic Criteria for NPP and FPP Turbines. "Heavy Industry", M,, No. 8, 1991, p.p. 16-19.

45. Visco-Elastic Damper. Patent of Russia No. 1612151, F16, F9/06, 1990.

46. Visco-Elastic Damper. Patent of Russia No. 1689693, F16, F9/067, 1991.

47. Visco-Elastic Damper. Patent of Russia No. 1821588, F16, F9/10, 1993.

48. Visco-Elastic Damper. Patent of Russia No. 1821589, F16, F9/10, 1993.

49. Visco-Elastic Damper. Patent of Russia No. 1821590, F16, F9/10, 1993.

50. CKTI Damper a New Way for Solving the Problem of Protection of Piping Systems, Equipment and Constructions Against Dynamic and Seismic Impacts. Proc. of 9 EAEE, Vol. 3, EAEE, September 1990, Moscow, Russia.

51. Application of High Viscous Damper on Piping Systems and Isolation Floor System. Proc. of 9 EAEE, Vol. 3, EAEE, September 1990, Moscow, Russia.

52. Application of CKTI Damper for Protecting Piping Systems, Equipment and Structures against Dynamic and Seismic Response. SMIRT 11, Transactions Vol. K, August 1991, Tokyo, Japan.

53. CKTI Visco-Elastic Dampers for Seismic and Vibration Isolation of Piping. "Transactions of CKTI", Vol. 272, 1992, p.p. 81-87.

54 - 55. Application of Mathematical Model for High Viscous Damper to Dynamic Analysis of NPP Piping.
Working Material, SMIRT 12 Post Conference Seminar, IAEA, Vienna, 1993 and
Proc. of 10 EAEE, Vol. I, Abstracts, Aug.-Sept. 1994, Austria, 1994.

56 - 57. Upgrading of Seismic Capacity of VVER Equipment Including Reactor Control Rods and Distribution Systems.
Working Material, SMIRT 12 Post Conference Seminar, IAEA, Vienna, 1993 and
Proc. of EAEE, Vol. 2, Abstracts, Aug.-Sept. 1994, Austria, 1994.

58. Seismic Analysis of VVER NPP primary coolant loop with different seismic devices. Transactions of SMIRT 13, Porto Alegre, Brazil, 1995.

59. Former Soviet regulations for SEISMIC Design of NPPs and Comparison with Current International Practice. International Symposium on Seismic Safety Relating to NPPs. Kobe, Japan, March 3-6, 1997.

60. Optimization of structural layout of 3-D low-frequency seismic isolation system of reactor building. Transactions of the 14th SMIRT, Lyon, France, August 1997.

61. Seismic analysis of the safety related piping and PCLS of the VVER-440 NPP. Transactions of the 14th SMIRT, Lyon, France, August 1997.

62. Upgrading of Dynamic Reliability and Life Extension of NPP Piping by means of HVD Technology. (K634-1). Transactions of 14th SMIRT Conference, Lyon, France, August 1997

63. Analysis of seismic and vibration capacities of WWER-1000 Control Rod Drive Systems. Transactions of the 14th SMIRT, Lyon, France, August 1997.

64. V. Kostarev, A. Berkovski, A. Schukin. Aseismic Design and Analysis of the Primary Coolant Loop and Safety Related Piping Systems of Russian Design NPP WWER-440. Transactions of PVP ASME Conference, Boston 1999

65. V. Kostarev, A. Berkovski, A. Schukin. Upgrading of dynamic reliability and life extension of piping by means of high viscous damper technology. Transactions of PVP ASME Conference, Boston 1999

66. J.Stevenson A.Berkovski, O.Kireev, V.Kostarev. Analysis of non-classically dampened structures, methodology and practical results. Transactions of PVP ASME Conference, Seattle, 2000

67. Костарев В.В., Павлов Д.Ю., Алексеев В.Н. Повышение динамической надежности и продление срока службы трубопроводов при использовании технологии высоковязкого демпфера. Журнал «Тяжелое Машиностроение", № 8, 2000.

68. V. Kostarev, V. Fomin, K-H. Reinsch Elimination of Power Capacity Limitation due to Main Piping Operational Vibration of the Chernobyl NPP Unit 3 in order to Burn Out Fuel before Final Shutdown. SMIRT 16, Division J # 1375, Wachington D.C., 2001

LICENSES OF NUCLEAR AUTHORITY

All CVS team members have successfully passed through the exams in Russian Nuclear Regulatory Commission in 2001 and have licenses and permission to fulfill design, analysis and to work on Nuclear Plants.