## BIO-SKETCH OF D.SRINIVASA RAO, SCIENTIST-G


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### ACADEMIC / PROFESSIONAL / TECHNICAL:

**Academic:** M.S. (Mechanical Engineering), National Technical Institute, Kiev, Ukraine (1991).

**Professional Experience:**

1991 – 1995: *Scientist, Indo-Soviet Advanced Powder Metallurgy Institute, Hyderabad, India.*

1995 - Present: *Scientist-G and Team Leader, Centre of Excellence for Engineered Coatings, International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI), Hyderabad, India*.

### TECHNICAL ACCOMPLISHMENTS

*Right from inception of ARCI, I have played a vital role in establishment of state-of-art coating technologies, which are unique in India and needed for Indian industries for employing protective coatings on variety of engineering components to enhance service life in collaboration with Russia, Ukraine, Belarus, Moldova,USA,Sweden,Germany,Poland. In addition to the coating facilities, I have been instrumental in establishing advanced material testing facilities required for characterization of coatings. My efforts, encompassing substantial R&D and application development besides indigenous development of the technology that has already been transferred to entrepreneurs, have ensured that the Indian industry reaps the benefits of promising technologies. As a Project Leader of Centre for Engineered coatings, my technical, managerial and administrative contributions towards the other coating technologies also lead to successful development, transfer and implementation of surface engineering technologies to 18 private entrepreneurs located at different regions of India. It is to be noted that the coating technologies transferred to various entrepreneurs have led not only for the self-sustainability but also to the increased number of job opportunities (more than ARCI's current manpower strength) in the country. The brief summary of my achievements accomplished so far are discussed hereunder:*

**List of Sponsored / Contract National Projects Executed:** My active participation and coordination with colleagues as a Team Leader, the below listed projects that were meant for both strategic and civilian application development programs have been executed:

1. National Centre for Development of Advanced Materials and Manufacturing Processes for Clean Coal Technologies for Power Applications
2. Indigenous Development Of Thermal Barrier Coatings On High Pressure Turbine Rotor For Helicopter Applications
3. Design and Development of open air compatible state-of-the-art solar selective coating for high temperature concentrated solar thermal power generation applications
4. Wear resistant coatings for "Briquetting" machine components (Hammer mill, Ram & Die)
5. Coatings for Aerospace components of Sea Harrier aircraft: Refurbishment of LPC blades and HPC spacers of Pegasus Engine (Indian Navy).
6. Development of erosion resistant coatings for compressor blades (3BRD)
7. Development of wear resistant coatings for minting dies (MINT)
8. Improvements in Gas turbine performance via Novel Plasma Spray coatings offering protection against ingested species (DST EPSRC).
9. Development of Superconducting Cavity by Cold spray technique (BRNS).
10. Development of Chromium oxide- Alumina coating on propeller shaft seal drums (L&T).
11. Development of Refractory coatings for Electromagnetic rail guns (ARDE).
12. Development of High Entropy Alloy coatings by Cold Spray technique (ARDB).
13. Performance of Coatings under Fretting Wear conditions (GT MA).
14. Development of thick copper coatings on Steels for ITER applications- IPR, Gandhinagar in collaboration with IIT Ropar.
15. Indigenous Development of Fretting Wear and Corrosion Resistant Cr3C2-NiCr Coatings on LP Turbine Blades of Adour Engine for Jaguar Aircraft(HAL, Bangalore).
16. Development of Wear Resistant, WC-Co, WC-CoCr and Cr3C2-NiCr Coatings on Nozzles, 3rd Stage Compressor Disc and Sleeves of Kaveri Engine for LC Aircraft(HAL/GTRE, Bangalore).
17. Indigenous Development of Wear and Corrosion Resistant WC-Co, WC-CoCr and Cr3C2-Coatings on Thrust Bearing Plates &Sleeves and Shaft used in Pump for feeding of the boilers in Submarine Ship(DMDE, Hyderabad).
18. Development of Sliding Wear Resistant Cr3C2-25%NiCr coatings of various types and sizes of Spindle Valves used in Land Band Turbines(BHEL, NTPC and NPCL).
19. Development of Silt Erosion Wear Resistant Coatings WC-12Co and Al2O3-$TiO_2$on Guide Vanes used in Hydel Power Projects (NHPC).
20. Development of Wear & Corrosion Wear Resistant WC-10Co-4Cr Coatings on Piston Rods used in High Pressure Compressors(Ingersoll-Rand/Dresser land).
21. Indigenous Development of Abrasion, Sliding and High Temperature Resistant WC-Co, WC-CoCr, NiCoCrAlTaY and Cr3C2-NiCr Coatings on Various Sizes of Rolls used in Steel Industry(TELCO, SAIL and Bhushan Steel etc.).
22. Refurbishment of Aeroengine Components used in MIG Aircrafts(HAL, Koraput).
23. Development of Various Abrasion, Sliding and Low Friction Coatings on all Sizes of Wire Passing and Drawing Pulleys used in Cable Manufacturing Industries(HCL, ASACO and Other Private Sectors).
24. Development of High Temperature Resistant NiCoCrAlTY Coatings on Gas Turbine Blades used Thermal Power Plants(NTPC).
25. Establishment Of A National Facility For Electron Beam Physical Vapour Deposition (EB PVD) Technology for TBC Coatings Development for Gas Turbine Components (DRDO/SERC/ARCI).
26. Development of Thermal Barrier Coatings (TBCs) on Gas Turbine Engine components using EBPVD Technology (DMRL, Hyderabad).

**27.** High Temperature Thermal Cycling Testing of Alumina Brics for Wind tunnel applications(VSSC/ISRO-Trivandrum).
**28.** Investigation of Possible TBC Systems for Protection of Candidate Materials for HSTDV (, DRDL, Hyderabad).
**29.** Performance Evaluation of ESC coated Twist Drills (SERC-DST) .
**30.** Effect of Rare-Earth Dopants on Thermal Stability and Fracture Toughness of Nanocrystalline Zirconia-Based Thermal Barrier Materials (, SERC, DST).
**31.** Development of high conductivity and oxidation resistant silver coatings for super critical boiler test rig (BHEL Trichy).
**32.** Development of Erosion-Corrosion Resistant Coatings for Boiler Tubes (M/s. THERMAX Limited, Pune).
**33.** Development of Cr2O3-20Al2O3 coatings using DSC system and deposition of coatings on propeller shaft seal (DMDE through M/s. L&T Limited, Mumbai).
**34.** Development Of Micro Arc Oxidation Coating on Internal surfaces of UBGL Barrel (ARDE, Pune).
**35.** Development of high temperature coatings for copper tuyeres for Tata Steel Ltd., Jhamshedpur.
**36.** Development of electrically insulated coatings on traction motor bearing for Railways applications ,M/s NBC bearings Ltd. Jaipur.
**37.** Development of Tungsten Coating Technology for First Wall Application in ITER like tokamak (IPR).
**38.** Refurbishment of Pegasus engine component (LPC-III coated blade ) and recoatings of one sets(50nos) blades on Detonation spray system with WC-17Co Powder for Naval air base, Kochi.
**39.** Development of Abradable coatings for Spacers used in Pegasus engine of Indian Navy.
**40.** Development of cold sprayed Sn, Zn/ZrO2 and Cu/ZrO2 on aluminum and steel substrates, Siemens Technology and services Pvt. Ltd, Bangalore.
**41.** Development of Cold sprayed Ni-Cr and IN-625 on 4130 steel, GE India Technology Centre Pvt Ltd, Bangalore.

## I AWARDS AND HONORS & RECOGNITIONS

- Member of PRC on “Thermal Infrared Signature Technologies-THIRST” for NS&M, DG,DRDO
- Member of PRC on Development of Single Crystal HPT Blade and Vane in ready to fit condition(GTRE/DMRL/ARCI project)
- Best Technical Report Award from DMRL on Deposition of 7YSZ Thermal Barrier Coating on Single Crystal Turbine Engine Components using EBPVD Technique
- Received a Best engineer award by Lions Club International on 19.09.2010 organized on Engineers day celebrations BY Lions Club International, District 324.
- Member of Materials Research Society, India
- Received a Certificate and Selected me as a member of All Ukraine Engineers & Mechanics
- Received a Certificate of Appreciation from Director, DIPAS(DRDO) for interpretation during Indo-Russian Joint Meetings organized at DIPAS,DEBEL &DFRL with Director General, SPC Hygene & Professional Pathology
- Special Invitee member, Technical Advisory Board (TAB) and Technology Information Forecasting and Assessment Council (TIFAC) for transfer detonation spray coating technology to private entrepreneurs in India
- External Review member of SERC sponsored projects on Robotics and Manufacturing

- External expert member for recommendation of suitable protective coatings for Marine Kaveri Engine, Establishment of shot peening and thermal spray coating facilities at GTRE(DRDO), Bangalore
- Member, Oversight Committee for Materials Characterization for KMGT Engine
- Member, Review Committee for Materials, KMGT Engine
- Member, Peer Review Committee on "Thermal Infrared Signature Technologies(THIRST)-Defence Laboratory,DRDO

## II *LIST OF PUBLICATIONS: PATENTS, BOOK CHAPTERS, INTERNATIONAL PEER-REVIEWED JOURNALS, PROCEEDINGS AND NATIONAL PUBLICATIONS:*

### *A Patents:*

1. Naveen MC, Kumar S, Phani SP and **D.Srinivasa Rao**, An improved gas dynamic cold spray device and method of coating a substrate(Application No:T/E-1/6875/2017)

2. NP Wasekar, G. Sundararajan, **D.Srinivasa Rao** and Boeing Authors, Iron Tungsten Coating Formulations and Processes (Application No. 201611001190)

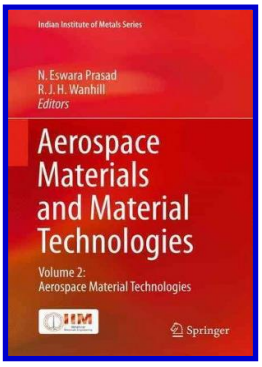
3. NP Wasekar, **D.Srinivasa Rao**, G. Sundararajan, A Method And An Apparatus For Preparing Nickel Tungsten Based Nanocomposite Coating Deposition, Indian Patent No: 337108 (Granted on 20/05/2020)

4. L. Rama Krishna, **D. Srinivasa Rao,** S.V. Joshi and G. Sundararjan, Process and apparatus for protection of Structural Members From Wear, Corrosion and Fatigue Damage – *Indian Patent Appln # 1839/DEL/2015*, *June 2015*

### *B Book Chapters:*

1. L. Rama Krishna, P. Suresh Babu, Manish Tak, D. Srinivasa Rao, G. Padmanabham and G. Sundararajan, Processing of Ceramic and Cermet Coatings for Aerospace and Strategic Applications, in Handbook of Advanced Ceramics and Composites Applications, Ed: Yashwant R Mahajan and Roy Johnson, Springer Nature, 2020. (In press)

2. L. Rama Krishna, P. Suresh Babu, Manish Tak, **D. Srinivasa Rao,** G. Padmanabham and G. Sundararajan, Ceramic and Cermet Coatings for Aerospace and Strategic Applications, in Handbook of Advanced Ceramics and Composites Applications, Ed: Yashwant R Mahajan and Roy Johnson, Springer Nature, 2018.




3. P Suresh Babu, **D Srinivasa Rao**, L Rama Krishna, Arvind Agarwal, G Sundararajan, Thermal Spray Coatings: Aluminum alloy protection, In book: Encyclopedia of Aluminum and Its Alloys, Publisher: Taylor & Francis, Editors: George E. Totten, Olaf Kessler, Murat Tiryakioglu, 2018,pp:2680-2695, ISBN-13:978-1466510807, ISBN-10: 1466510803.

4. **D. Srinivasa Rao,** L. Rama Krishna and G. Sundararajan, Detonation Sprayed Coatings for Aerospace Applications, in "*Aerospace Materials and Material Technologies*", Ed: N.E. Prasad, R.J.H. Wanhill, Pubs: Indian Institute of Metals Series, Springer Science + Business Media,

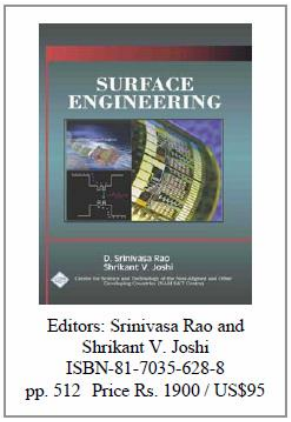
Singapore, 2017, pp: 483-500, ISBN: 978-981-10-2143-5, Article DOI: 10.1007/978-981-10-2134-3_22.

5. **D.Srinivasa Rao**, G.Sivakumar, D.Sen and S.V.Joshi, "Detonation Sprayed Coatings and Their Tribological Performance" in Thermal Sprayed Coatings and Their Tribological, M. Roy, & J. Davim (Eds.) Thermal Sprayed Coatings and their Tribological Performances, IGI Global, 2015. (pp. 294-327). Hershey, PA: Engineering Science Reference. doi:10.4018/978-1-4666-7489-9.ch010

6. G. Sundararajan, **D. Srinivasa Rao,** G. Sivakumar and S.V. Joshi, "*Detonation Spray Coatings*", in Encyclopedia of Tribology, Jane Wang & Wah Chung (Eds.), Publisher: Springer Science + Business Media, p. 736-742, 2013.

7. **D.Srinivasa Rao**, "*Detonation Spray Coatings*" in "Surface Engineering: Process Fundamentals and Applications", Lecture Notes 0f International Training Course And Business Opportunities Workshop On Surface Engineering, Published by NAM S&T Centre, Chapter 4 ,2009, Editors: D. Srinivasa Rao and S.V. Joshi,

8. **D.Srinivasa Rao**, "*Detonation Spray Coatings*" in "Surface Engineering: Process Fundamentals and Applications", Lecture Notes of SERC School on Surface Engineering, Editors: D. Srinivasa Rao and S.V. Joshi, 2003 Chapter 4 pp:1-26



Editors: Srinivasa Rao and Shrikant V. Joshi
ISBN-81-7035-628-8
pp. 512 Price Rs. 1900 / US$95

**Co-editor:**

1. A book titled" Surface Engineering: Process Fundamentals and Applications, Published by NAM S&T Centre, 2009, Editors: D. Srinivasa Rao and S.V. Joshi

**C *International and National Journals/Proceedings Publications:***

1. D.Vijaya Laxmi, P. Suresh Babu, L. Rama Krishna, G. R.Vijay,**D. Srinivasa Rao** and G. Padmanabham, Corrosion and Erosion behavior of Iron Aluminide (FeCrAl) Coating Deposited by Detonation Spray Coating, International Journal of Advanced Powder Technology(Submitted).
2. S. Gokul Laxmi, Dipak K. Das, Manish Roy, **D.Srinivasa Rao**, Influence of Temperature on Erosion rate of EBPVD and APS deposited TBC Coatings, Surface Engineering (Submitted)
3. P. Suresh Babu, Y. Madhavi, L. Rama Krishna, G. Sivakumar, **D. Srinivasa Rao** and G. Padmanabham, Thermal Spray Coatings for Erosion-Corrosion Resistant Applications, *Transactions of Indian Institute of Metals*,73(9), 2141-2159,(2020)
4. N.P. Wasekar, B. Lavakumar, L. Rama Krishna, **D.S. Rao** and G. Padmanabham, Pulsed electrodeposition, Mechanical Properties and Wear Mechanism in Ni-W/SiC Nanocomposite Coatings Used for Automotive Applications, *Applied Surface Science*, 527 (2020) 146896.
5. C Sundaresan, B Rajasekaran, G Sivakumar and D S Rao, Hot corrosion behaviour of plasma and d-gun sprayed coatings on t91 steel used in boiler applications, 2020 IOP Conf. Ser.: Mater. Sci. Eng. 872 012092
6. P. Uday Chandra Rao, P. Suresh Babu, **D. Srinivasa Rao**, S.V. Gopala Krishna, K. Venkateswara Rao, "Effect of Tribo-layer on the Sliding Wear Behavior of Detonation Sprayed Alumina–Titania Coatings". In: Reddy A., Marla D., Simic M., Favorskaya M., Satapathy S. (eds) Intelligent

Manufacturing and Energy Sustainability. Smart Innovation, Systems and Technologies, Vol 169. (2020) 289-298, Springer, Singapore

7. P. Suresh Babu, L. Venkatesh, **D. Srinivasa Rao**, N. Ravi, "Fracture behaviour of nc-TiAlN/a-Si3N4 nanocomposite coatings under cyclic nano impact testing", Surface Engineering 36 (2020) 671-679
8. Krishna Valleti, Smita G. Rao , Pooja Miryalkar , A. Sandeep, **D. Srinivasa Rao**, Cr-(CrN/TiAlN)m-AlSiN-AlSiO open-air stable solar selective coating for concentrated solar thermal power applications, Solar Energy Materials & Solar Cells 215 (2020) 110634.
9. L. Rama Krishna, Y. Madhavi, T. Sahithi, **D. Srinivasa Rao**, S.V.K. Ijeri, Om Prakash, S.P. Gaydos, Taber Wear Performance of Micro Arc Oxidation and Hard Anodized Coatings: Introspection of Aerospace Acceptance Criterion, *Journal of Materials Science and Technology,* 2020. (Communicated)
10. L. Rama Krishna, Y. Madhavi, P.S. Babu, **D. S. Rao**, G. Padmanabham, Strategies for Corrosion Protection of Non-ferrous Metals and Alloys Through Surface Engineering, *Materials Today: Proceedings* 15 (2019) 145-154.
11. Nitin P. Wasekar, L. Rama Krishna, **D. S. Rao,** G. Padmanabham, Novel Nanostructured Coatings by Pulsed Electrodeposition, *Indian Engineering Exports,* 12 (7) (2019), 16-24.
12. L. Rama Krishna, Y. Madhavi, P.S. Babu, **D.Srinivasa Rao,** G. Padmanabham, Strategies for Corrosion Protection of Non-ferrous Metals and Alloys Through Surface Engineering, *Materials Today: Proceedings 15* (2019), pp: 145-154

13. P.Suresh Babu, Y. Madhavi, L. Rama Krishna, **D.Srinivasa Rao**, G. Padmanabham, Thermally Sprayed WC-based Cermet Coatings for Corrosion Resistance Applications, JOM 70 (11) (2018) 2636-2649.

14. L. Rama Krishna, Y. Madhavi, T. Sahithi, **D.Srinivasa Rao**, S.V.K. Ijeri, Om Prakash, S.P. Gaydos, Enhancing the high cycle fatigue life of high strength aluminum alloys for aerospace applications, Fatigue and Fracture of Engineering Materials and Structures, 42 (2019) 698-709.

15. Krishna Valleti, K. Sai Jyotheender and **D.Srinivasa Rao**, Effect of Pulsed Biasing on the Droplet Formation and the Properties of Cylindrical Cathodic Arc–Grown Erosion-Resistant TiN Coatings, Tribology Transactions, DOI: 10.1080/10402004.2018.1502856.

16. P. Suresh Babu, P. Chanikya Rao, A. Jyothirmayi, P. Sudharshan Phani, L. Rama Krishna, **D.Srinivasa Rao**, Evaluation of microstructure, property and performance of detonation sprayed WC-$(W,Cr)_2C$-Ni coatings, Surface and Coatings Technology, 335 (2018) 345-354.
17. Shailesh. K, Sivakumar.G, **Srinivasa Rao.D,** Krishna Valleti, Samir Khirwadkar et all, "High Heat Flux testing of atmospheric plasma sprayed thick Tungsten coating on structural and heat sink material, J. Nuclear Materials, 4,2018
18. P Suresh Babu, D.Sen, LRK, Jyothirmayee and **D.Srinivasa Rao** Development of wear and corrosion resistant $Cr_2O_3$-$Al_2O_3$ coating by detonation spray technique, *Ceramics International*, 44(2) (2018) 2351-2357.

19. L.Ramakrishna, Y.Madhavi,T.Sahiti,N.Wasekar,M.Chawan and **D.Srinivasa Rao**, Influence of prior shot peening variables on the fatigue life of micro arc oxidation coated 6061-T6 Al alloy, International Journal of Fatigue, 106(2018),pp.165-174.

20. Sanjay.B. Karuna Jain, **D.Srinivasa Rao**, SV Joshi,Technology Commercialization in Advanced Materials Sector: A Case Study in the Indian Context, Journal of Intellectual Property Rights(JIPR-279) (accepted)
21. P Suresh Babu, **D.Srinivasa Rao**, L Rama Krishna, G Sundararajan, "Weibull analysis of hardness distribution in detonation sprayed nano-structured WC-12Co coatings", J.Surf. Coat. Technol, 319(2017)394-402.
22. S. G. Lakshmi; C: Parlikar; Md. Z. Alam; D. Charterjee; N. Hazari; D.V.V. Satyanarayana; D. K. Das, D. Sen; **D.Srinivasa Rao**, Indigenous development of thermal barrier coating technology on single crystal gas turbine engine components at DMRL, Journal of Aerospace and Technologies, Vol.69, No.1A, Feb.2017.
23. Sanjay.B. Padmanabham.G, Karuna Jain **D.Srinivasa Rao**, Partnership Strategy for the Development, Demonstration and Transfer of an Advanced Materials Technology, NITIE-NCIETM 2016, 595-602
24. Nitin P. Wasekar, S. Madhavi Latha **D.Srinivasa Rao** and G. Sundararajan, Pulsed Electrodeposition and Mechanical Properties of Ni-W/SiC Nano-Composite Coatings, Materials and Design, 112 (2016) pp. 140-150
25. P. Anish Mathews., S. Bhardwaj, G. Padmanabham and **D.Srinivasa Rao**, "Patent Trends of Detonation Spray Coating Technology", Recent Patents on Mechanical Engineering, Vol. 9(1), p 9-19, 2016.
26. D Sen, S.Nirmala, **D.Srinivasa Rao**, Influence of Pulse Frequency on WC-Co and $Al_2O_3$ Coating Properties obtained by DSC Technique, Proc. ATSC 2014, p.121-122.
27. P Suresh Babu, **D.Srinivasa Rao**, D Sen, Ravi C. Gundakaram and S V Joshi, A Study on Wear and Corrosion Resistant $Cr_2O_3$-$Al_2O_3$ Coating by Detonation Spray Technique, Proc. ATSC 2014, 2014. p.166-167
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29. D. Srinivasa Rao, G. Ranga Janardhan, Krishna Valleti, S.V. Joshi, Processing-Structure-Property Relationships in EB-PVD Yttria Stabilized Zirconia (YSZ) Coatings, Journal of Vacuum Science & Technology A 29, 2011
30. Naveen Manhar Chavan, M.Ramakrishna, P.Sudharshan Phani, **D.Srinivasa Rao** and G.Sundararajan, Influence of Process Parameters and Heat Treatments on Properties of Cold Sprayed Silver coatings, Surface and Coating Technology, 205 (2011), p.4798-4807
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**D** ***Technical Reports:***

1. Deposition of 7YSZ Thermal Barrier Coating on Single Crystal Turbine Engine Components using EBPVD Technique.
2. Effect of Substrate Temperature. Bondcoat Surface Roughness and Presence of Thermally Grown Oxide Layer on Microstructure and Thermal Cycling Life of EBPVD TBC

3. Development of Thermal Barrier Coatings Using Electron-Beam Physical Vapour Deposition Method, Part-I: Literature Review and Initial Characterization of Coatings

4. Thermal Barrier Coatings Using Electron-Beam Physical Vapour Deposition Method, Part-II: Studying the effect of process parameters
5. Review committee recommendations on Materials &Coatings for KMGT Engine
6. Oversight Subcommittee recommendations on coatings for KMGT Engine
7. *Detonation Gun Coating on LP Turbine Blades"*,T.R.No.ARCI/TR/9501,November,1995
8. *Dynamic Ultra-Microhardness Tester*",T.R.No.ARCI/TR/9601,January,1996
9. *Detonation Coating Gun-Selected Case Studies :*T.R.No.ARCI/TR/002,Match,1994
10. *Molybdenum Discs for Heavy-Duty-Electronic Applications-A novel P/M Product* ,T.R. No.ARCI/TR/004,1994
11. *Experimental Design and Optimization of Coating Thickness in Detonation Coating Process*,
12. Part-I: Coating of Tungsten Carbide-Cobalt Powder on Aluminium Substrate without manipulator. T.R.No.ARCI/TR/006,August, 1994
13. *Experimental Design and Optimization of Coating Hardness in Detonation Coating Process*",
    a. Part-II : Coating of Tungsten Carbide-Cobalt Powder on Aluminium Substrate without manipulator. T.R.No.ARCI/TR/007,August, 1994
14. *Experimental Design and Optimization of Coating Thickness in Detonation Coating Process*,
    a. Part-I :Coating of Tungsten Carbide-Cobalt Powder on Aluminium Substrate with manipulator. T.R.No.ARCI/TR/008,August, 1994
15. *Experimental Design and Optimization of Coating Hardness in Detonation Coating Process,*
    a. *Part-II :*Coating of Tungsten Carbide-Cobalt Powder on Aluminium Substrate with manipulator. T.R.No.ARCI/TR/010,August, 1994
16. *Characterization of SHS produced Powders Received from Isman*", T.R.No.ARCI/TR/011,November 1994.
17. *Installation, Commissioning and Application of a Detonation Coating Gun*, T.R.No.ARCI/TR/001,June 1992

**III Presentations at International & National Conferences / Workshops /Seminars**

1. Technical Presentation on Thermal Cycling Behaviour of EBPVD Deposited TBC Coatings on NiCoCrAlY Bondcoats Obtained by DSC and APS Techniques, at International Conference and Exhibition on Heat Treatment and Surface Engineering, May 16-18, 2013
2. Detonation Sprayed Coatings using SHS powders, Indo-Belarus Workshop on Material Science and Metallurgy, November 15-16, 2012, Hyderabad.
3. Delivered a Lecture on Electron Beam Physical Vapour Deposition Technology , Surface Engineering Technologies : Research and Applications (SETRA), August 27-31, 2012
4. Delivered a Lecture on Detonation Spray Coating Technology and its Application, Surface Engineering Technologies : Research and Applications (SETRA), August 27-31, 2012
5. Lecture on Electron Beam Physical Vapour Deposition (EBPVD)" at the ARCI-MIAE meeting g (organized by DST) held at NOVOTEL, Hyderabad during 26-27 January 2011.
6. Attended ITSC-2011 (International Thermal Spray Conference) Conference and Exhibition held at Singapore during 3rd-5th May, 2011.
7. Co author of a paper presented on "Effect of bond coat surface roughness and thermally grown oxide layer on the microstructure and thermal cycling life of the EB-PVD TBC" at NMD, November,2011
8. Several talks on " Detonation Spray Coating Technology and Its applications in Power & Aerospace Sectors (For BHEL, HAL, SIEMENS and ABB ALSTOM)

9. Co author of a paper presented on "Technology Commercialization: A Case Study" at the 'R & D Management Conference on Managing the New Genre R & D: Indian Perspective' organized by CSIR, New Delhi,Dec,08.
10. Delivered a technical talk on "Surface Engineering " at Vikram Sarabhai Space Centre, Trivandrum, India) 26th August, 2008
**11.** Lecture on Detonation Spray Coating Technology and Applications", at International Training Course And Business Opportunities Workshop On Surface Engineering, July 19-26, 2005, ARCI, Hyderabad, India
12. Detonation Spray Coating Technology at SERC School on surface engineering, 19 July 2005
13. Surface engineering for life extension of engineering components at national seminar advanced engineering materials organized by IEM, Hyderabad, 29 October 2004
14. Detonation spray coating Technology and its applications, TDB review meeting, New Delhi, 10 August 2004
15. Evaluation of detonation sprayed coatings bond strength at NTPC, New Delhi, and 14 July 2004
16. Detonation Spray Coating Technology at SERC School on surface engineering, 16 July 2003
17. Powders for surface engineering organized by PMAI at ARCI, 16 October 2003
18. Issues in development of carbide based coatings using DSC technique at Indo-French Workshop, 25 November 2002
19. Prospects of depositing carbide coatings by cold spray technique at 13th IFHTSE, USA on 8 October 2002
20. Assessment of effect of binder in WC based coatings obtained by DSC, ASM International, Mumbai, March 2002
21. Various aspects in coating of aeronautical components using DSC at HAL, Koraput, 18 December 2001
22. Progress on ESC for enhanced performance of twist drills at IIT Chennai, 14 December 2001
23. Powders for surface engineering organized by PMAI at ARCI, 7 November 2001
24. Prospects of thermal spray coatings in fighter aircraft engine parts, Base Repair Depo-3, Chandigarh, 18 June 2001
25. Influence of powder characteristics on properties of DSC sprayed Cr3C2-25NiCr coatings Engine Division, HAL, Bangalore on 11 May 2001
26. Two technical lectures on Thermal Spray and DSC Technology at HAL, Koraput
27. Refurbishment of aero-engineering components using Surface Coating Tehnologies, 19 –20th June, 3 Base Repair Department, Chandigarh..
28. Detonation spray coating technology transfer and its applications in aero-industry, 11th May-2001, HAL, Engine Division, Bangalore
29. Protection and Refurbishment of aeroengine components using detonation spray and electro-spark coating techniques, presented in International seminar on Refurbishing of Gas Turbine components, 26-27th November 2000 at HAL, Sunabeda Orissa.
30. *Prospective applications of thermal spray coatings for wear resistance of hydel components*, at first international conference on Silting Problems in Hydro Power Plants at New Delhi on 13-15th October, 1999
31. *A techno-commercial feasibility of Detonation gun technology*, at Two-day seminar on Surface Engineering-99, January 1999. (Published in seminar souvenir)
32. *A techno-commercial feasibility of Micro Arc Oxidation technology*, at Two-day seminar on Surface Engineering-99**,** January 1999. (Published in seminar souvenir)

33. *Characterization and Application of Tungsten Carbide-Cobalt(92-8) Coatings Deposited by Electro-Spark Coating Technique*, Poster Session of 50th Annual Technical Meeting of IIM, AT New Delhi,14-17th November,1996
34. *Tribological Behaviour of Detonation Gun Coatings*, at PM-97 International Conference on PM for Automotive Components, New Delhi, February 10-12 1997.
35. *A techno-commercial feasibility of Detonation gun technology*, at Two-day seminar on Surface Engineering-99, January 1999. (Published in seminar souvenir)
36. *A techno-commercial feasibility of Micro Arc Oxidation technology*, at Two-day seminar on Surface Engineering-99**,** January 1999. (Published in seminar souvenir)
37. *Prospective applications of thermal spray coatings for wear resistance of hydel components*, at first international conference on Silting Problems in Hydro Power Plants at New Delhi on 13-15th October,1999
38. *Process parameter influence on thermo-mechanical properties of Alumina coated by Detonation Spray Coating (DSC) system* , at 37th NMD/53rd ATM organized by IIM at IIT Kanpur
39. *The characterization of ultra-hard Alumina coatings obtained through Micro arc oxidation technique*, at 37th NMD/53rd ATM organized by IIM at IIT, Kanpur.
40. Delivered a lecture on Detonation Gun & Electrospark Coating Technology at BHEL, Bhopal, 1997.
41. Attended IAF base at Goa, to deliver a lecture on Detonation gun technology application on engine components of aircraft, September 1998.