


PERSONAL INFORMATION



Professor Nawal K Prinja

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Sex Male | Date of birth 30 October 1954 | Nationality British

JOB APPLIED FOR

Technical Advisory Panel

WORK EXPERIENCE

October 2007 – Present

Technical Director

AMEC, Knutsford Cheshire. (United Kingdom)

December 2000 – October 2007

AMEC Head of Profession/Technical Manager

AMEC, Cheshire. (United Kingdom)

April 1996 – December 2000

Head of the Structure Analysis Team

AMEC, Cheshire. (United Kingdom)

January 1994 – April 1996

Head of the Structure Analysis Group, Safety Engineering Department

AMEC, Cheshire. (United Kingdom)

November 1987 – December
1993

Section Head, Stress Analysis, Structural Mechanics Department

AMEC, Cheshire. (United Kingdom)

March 1986 – November 1987

Senior Engineer, Computational Mechanics Section

AMEC, Cheshire. (United Kingdom)

November 1980 – March 1986

Mechanical engineer

AMEC, Cheshire. (United Kingdom)

August 1976 – November 1980

Engineer

Dunlop Aviation Division, (United Kingdom)

EDUCATION AND TRAINING

1971 – 1976	BTech- IIT (Aeronautics) Indian Institute of Technology (IIT), Kharagpur (India)	First Class Honours
1978 – 1979	MSc (Mechanical Engineering) University of Newcastle-upon-Tyne, Newcastle-upon-Tyne (United Kingdom)	MSc
1982 – 1987	PhD (Applied Mechanics) University of Manchester, Manchester (United Kingdom)	PhD

PERSONAL SKILLS

Mother tongue(s) English

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
Hindi	C2	C2	C2	C2	C2
Sanskrit	B2	B2	B2	B2	B2
French	A1	A1			

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user
[Common European Framework of Reference for Languages](#)

Communication skills Very good written and oral communication skills in English acquired through years of teaching and consultancy work including participation in meetings organised by national and international organisations.

Organisational / managerial skills Acquired through managing the technical processes and the Competency Assurance System that is used to manage, monitor and develop the technical capability of professional staff.

Job-related skills Professor Prinja has over 40 technical publications to his credit and research work on the study of pipe rupture and pipe whip problem has received international recognition and has been used by the Institute of Nuclear Safety in Korea.

Professor Prinja is co-author of the following three books published by NAFEMS:-

- 'Finite Element Analysis in the Design Process'
- 'An Introduction to the Use of Materials in FE'
- 'How to do Seismic Analysis using Finite Elements'

Under AMEC's Operational Excellence project, he was appointed to be part of the Engineering Directorate to help improve the engineering processes across all of AMEC companies worldwide.

Professor Prinja is very keen to promote engineering and has delivered lectures at various academic institutions. In May 2009, he was appointed as an Honorary Professor in the School of Engineering at Aberdeen University. Professor Prinja has acted as an Expert Witness in legal cases involving mechanical and civil engineering issues and in 2012 he was appointed as a member of the Nuclear

R&D Advisory Board to the UK Government.

Professor Prinja has been Head of Profession/Technical Manager for over 10 years and since 2007 as Technical Director his main responsibilities include:

- Advise the Executive Team and the business teams on technical issues and provide technical lead in high profile projects.
- Develop strategy for maintenance and development of technical personnel, hardware and software.
- Keep abreast of new developments and best practice in nuclear industry.
- Monitor and ensure effectiveness of arrangements to maintain technical quality of consultancy work.
- Keep fully abreast with national and international regulatory developments, and codes and standards related to nuclear industry.
- Technical representation of AMEC Nuclear at national and international bodies/organisations.
- Building effective technical partnership and coordination between different Business Teams within AMEC and other AMEC businesses.
- Develop Technical Networks across whole of AMEC and represent AMEC at national and international meetings.
- Develop effective working relations with research bodies and academic institutions.

Computer skills In depth understanding of the analysis and simulation computer codes (FEA and CFD) acquired through PhD research and subsequent applications in nuclear industry.

Driving licence B, BE, C1, C1E, D1, D1E

ADDITIONAL INFORMATION

Professional Profile

Nawal Prinja has over 30 years of academic and industrial experience in the nuclear sector. He has provided technical leadership to a number of international projects some of which involved interactions with the Regulators in the UK, France, Canada, USA, S Africa, Romania and IAEA. He was invited as an expert by IAEA to help prepare their first safety guide on 'construction of nuclear installations' and revising their Safety Requirements. He participates in the World Nuclear Association's Working Group on Cooperation in Reactor Design Evaluation and Licensing (CORDEL) and has been appointed as the Chair of an international task force to work with Standard Development Organisations (ASME, JSME, CSA, KEA, NIKIET and AFCEN) to help harmonise codes and standards used in the nuclear industry. In recognition of his expertise, he was invited last year by Sir John Beddington, UK Government's Chief Scientific Advisor, to serve as a member of the Nuclear R&D Advisory Board that was formed to review the nuclear R&D landscape, produce industrial vision and make recommendations for the long-term nuclear energy strategy.

Professor Prinja's core expertise is in structural integrity particularly in the use of computational modelling to prove safety of engineering components, structures and systems. Prof. Prinja has been directly responsible for the design substantiation of nuclear reactor components e.g. pressure vessels, piping systems, concrete liners, support structures, penetrations, nuclear waste packages etc. He provided technical leadership to the AMEC team working to substantiate the Vacuum Vessel design for ITER IO.

As a senior engineer in the Computational Mechanics Section Prof. Prinja was responsible for assessment of computer codes for CFD, soil/structure interaction analysis, technical support for finite element analysis (FEA) codes and inelastic analysis of structures operating at high temperatures. He has supervised completion of several projects, which included the work associated with the structural integrity reports for the Sizewell 'B' PWR containment, Heysham II/Torness reactor components, Vacuum Vessel for ITER IO, the Shiplift platform at HM Naval Base Clyde, pressure vessels for AWE and assessment of nuclear waste packages. He has used the British design codes, American NUREG regulations, French RCC and Euro codes. He also substantiated Above Core Structures for a Fast Reactor design (EFR) and the Vacuum Vessel for the Fusion project which involved use of the French code RCC-MR.

Under a technology transfer contract (TACIS), he trained Belgom and Russian engineers to use general purpose finite element codes.

As Head of Profession and Technical Manager, Prof. Prinja led the British team in the international roundrobin project which successfully predicted the pressure retaining capacity and failure mode of a

¼ scale pre-stressed concrete pressure vessel tested at the Sandia National Laboratories at Albuquerque, USA. Currently he is leading research effort aimed at predicting the behaviour of another containment being tested by BARC in India under the international BARCOM project.

Also Professor Prinja was technical lead for a number of projects involving design improvements and failure investigations involved fracture assessment to BS7910 and API 579.

Professor Prinja was responsible for development of benchmarks for NAFEMS to test nonlinear analysis capabilities of 3D beam and shell finite element packages and problems involving contact, gapping and sliding. He provided technical leadership to a major project in which probabilistic and deterministic assessment methods based on finite elements and reliability analysis were used to make a safety case for a shiplift structure for the Ministry of Defence (UK). He was technical lead for the Probabilistic Seismic Hazard Assessment (PSHA) and Probabilistic Fault Displacement Hazard Assessment (PSHA) studies for the UK EPR sites.

Professor Prinja has delivered lectures on practical aspects of nuclear engineering covering the challenges facing the new build, life extension of existing reactors, decommissioning and waste management. His team was funded by NIREX (now NDA) to help improve methods for assessing radioactive waste packages.

Professional Appointments and Accreditations

- Chairman of international Task Force for Harmonisation of Codes & Standards for nuclear industry set up by the CORDEL Group of the World Nuclear Association.
- Technical Expert invited by IAEA to work on their first Safety Guide on "Construction of Nuclear Installations" and review the revision of the Safety Requirements by NUSSC.
- Honorary Professor in the School of Engineering at Aberdeen University.
- Member of the Nuclear R&D Advisory Board to the Her Majesty's Government.
- Assessor appointed by the Technology Strategy Board of Her Majesty's Government.
- Fellow of the Institute of Mechanical Eng. (London).
- Chairman of the ABAQUS User Group (UK) from 1991 to 1999.
- Co-ordinator of the Power and Pressure Vessel group of Europe wide FENET project aimed at promoting the use of Finite Element technology.
- Co-ordinator for the ASRANET (Network for integrating structural safety, risk and reliability) project in the nuclear industry.
- Member of the EASIT2 group working on EU funded project to prepare an educational base and competency frame work for engineering and simulation engineers.
- Member of the International Scientific Committee of SMiRT (Structural Mechanics in Reactor Technology).
- Member of the North West Science Council nuclear sub-team.
- International coordinator of the Professional Simulation Engineer (PSE) certification being run by NAFEMS based on EU funded EASIT project.

Presentations/Publications

- Post Collapse Cross-Sectional Flattening of Thick Pipes in Plastic Bending Nuclear Eng. and Design, V83, pp113-121 (1984)
- Damage Criteria for Pipe-on-Pipe Impacts, Structural Impact and Crashworthiness, vol 2, pp 331-342, Elsevier Applied Sci.Pub., (1984).
- The Large Strain-Large Displacement Behaviour of a Whipping Pipe, Inst. Mech. Eng, paper C4/85, Pipe Work and Design conf., pp 225-234, (1985).
- Finite-Element Analyses of Post-Collapse Plastic Bending of Thick Pipes, Nuclear Eng. and Design, v91, pp 1-12, (1986).
- Large Rotation-Large Strain Analysis of Pipe Whip with Flow Choking, Nuclear Eng, and Design, v93, pp69-81, (1986).
- Numerical Analyses of Pipe Impact on Reinforced Concrete Structures, 9th SMiRT Conf., vol H, pp363-368, Lausanne, Switzerland, (1987). Full paper in Res Mechanica, v30, pp 305-331, (1990).
- On Dynamic Behaviour of a Long Missile Pipe After Impact on a Rigid Target Pipe, Int. J. Impact Eng., v7, N4, pp 379-390, (1988).
- The Mechanics of Pipe Whip, Inst, Mech. Eng.(London), 2nd Conf. on Pipework Engineering and Operation, 21-22 February, (1989).9. Combined Beam Elements for Large Dynamic Motion of Whipping Pipes with Fluid-structure Interaction, Finite Elements in Analysis and Design, 11, pp117-152. (1992).
- The Use of Numerical Analysis Results in Assessment Procedures, Relevant to Design Standards, I.Mech E Seminar (S036) on Developments in Pressure Vessel Technology, London 5 May 1992.
- Geometric and Material Idealisation, NAFEMS Technology Transfer Seminar, Coventry, 24 Nov

1992.

. Benchmark Problems for Geometric Non-linear Behaviour of 3-D Beams and Shells, NAFEMS Publication R0024, 1993.

. Use of Hyperelastic Material Model in Analysis of Elastomeric Pads, Inst.Mech Eng (London) Seminar (S300), Rubber Engineering Using FEA, 4 April 1995.

. Probabilistic Assessment of Structures Using Nonlinear Analysis Capability of ABAQUS, ABAQUS Users World Conference, Paris, May 31-June 2 1995.

. Design Substantiation of Pressurised Concrete Pressure Vessels by Finite Element Analysis, Int. Conf. on Nuclear Containment, 23-25 Sept 1996, Univ. Of Cambridge, Inst. of Nuc. Eng.

. Probabilistic and Deterministic Assessment for Safety Case of a Shiplift Structure, Int. Conf. On Assuring It's Safe, 18-19 May 1998, I Mech E Conf. Trans. 1998-6, C535/008/98, pp 41-52, (1998).

. The Buckling of Tube under External Pressure, Int.Conf. On Assuring It=s Safe, 18-19 May 1998, I Mech E Conf. Trans. 1998-6, C535/010/98, pp 189-200, (1998).

. Failure Investigation in the Offshore Industry, NAFEMS Model Validation Workshop, 1 Dec 1998, Warwickshire, UK.

. Failure Investigation of a High Integrity Lifting Structure, Abaqus World Conf., Chester, UK, May 1999.

. Predicting Technical Limits for Safe Operation, Int. Conf. Safety on Offshore Installations, London, 30 Nov-1 Dec 1999.

. 'Finite Element Analysis in the Design Process', book published by NAFEMS, July 2000.

. Simulation of Cracking in Prestressed Concrete Pressure Vessels and Containments, ost SMiRT 16 Seminar on Containment of Nuclear Reactors, Albuquerque, N Mexico, USA, Aug 20-21, 2001.

. 'Benchmark Tests for Finite Element Modelling of Contact, Gapping and Sliding', Report R0081 published by NAFEMS, 2001.

. Simulation of Stretch Bending Process- An Application of Nonlinear FEA for Automotive Industry, NAFEMS Awareness seminar, IMechE, London, 4 Sept 2001.

. Probabilistic Assessment of High Integrity Shiplift Structure, 1st International ASRANET Colloquium, Glasgow University, July 2002.

. Numerical Simulation of Limit Load Testing of ¼ Scale Pre-stressed Concrete Containment Vessel, Pressure Equipment Technology - Theory and Practice, Professional Engineering Publishing Limited, May 2003.

. 'Failure Investigation in the Offshore Industry', NAFEMS World Congress on Innovative Engineering Simulation Technology, Orlando, Florida, 27-31 May 2003.

. 'Simulating Structural Collapse of a PWR Containment', Prinja and Shepherd, Paper H592, SMiRT-17, Prague, Czech Republic

. 'Predicting Hoop Tendon Behaviour in Pre-stressed Concrete Containment Vessel', N K Prinja, M F Hessheimer and R Dameron. Advances in Experimental Mechanics, Trans Tech Publications Ltd. Sept 2004.

. 'Review of FEA Technology Issues Confronting the Power Industry', Prinja and Davidson, FENET Meeting Proceedings, May 2005.

. 'Computational Modelling to Predict waste package Performance', N K Prinja and A Buckley. 33rd Waste Management Conference, WM07, June 2007.

. 'An Introduction to the Use of material Models in FE', book published by NAFEMS, R0091, 2006.

. 'How to Do Seismic Analysis Using Finite Elements', book published by NAFEMS, HT36, 2007.

. 'Prediction of residual stresses in bridge roller bearings using ABAQUS', J Bushell and N K Prinja, ABAQUS World Conference, May 2008.

. 'AMEC's Role in Meeting Technical Challenges Facing the Nuclear Industry', N K Prinja, Nuclear Future, Journal of the INucE and BNES, May 2008.

. 'Prediction of crack growth in bridge roller bearings', N K Prinja, J M Bushell, R Chanwani and C Timbrell. NAFEMS World Congress 2009, June 2009.

. 'Probabilistic Seismic Hazard Assessment for Nuclear Sites', 5th International ASRANet Conf., June 2010.

. 'Predicting Pre-Stressed Concrete Containment Capacity', Nawal K Prinja, Kalyan Kamatam and James A Curley. Transactions, SMiRT 21, 6-11 November, 2011, New Delhi, India Div-III: Paper ID 628.

. 'Analysis of the Barc Containment Model', Kalyan Kamatam and Nawal K Prinja, Transactions, SMiRT 21, 6-11 November, 2011, New Delhi, India Div-V: Paper ID 820.

. 'The Development of a Competence Framework for Engineering Analysis and Simulation', J.Wood, T.Morris and N.Prinja. Transactions, SMiRT 21, 6-11 November, 2011, New Delhi, India Div-III: Paper ID 530.

- . 'Pilot Project for harmonisation of Codes and Standards Applicable to Nuclear Reactor Designs', 2nd MDEP Conf. on New Reactor Design Activities, OECD Nuclear Energy Agency (NEA), Paris, April 2012.
- . 'Transferring simulation skills from other industries to nuclear', Nawal Prinja, Jim Wood and Tim Morris. Nuclear Future, V9 Issue 1, 2012.
- . 'Harmonisation of Design Codes and Standards in Nuclear Industry', Nawal K Prinja, 6th International ASRANet Conf., July 2012.