

CONSULTANTS IN ENGINEERING
AND ENVIRONMENTAL SCIENCES

Dr. Akshai K. Runchal
Curriculum Vitae

TITLE **Principal Engineer**

EXPERTISE Mathematical Models, Computational Fluid Dynamics (CFD)
Gas Turbine Engine Performance Analysis
Combustion, Fluid Dynamics, Heat Transfer and Turbulence
Environmental Pollution

EXPERIENCE

Project Manager or Principal Investigator in over 200 projects over a 30 year professional carrier covering a wide range of disciplines.

Development and application of mathematical models for a broad spectrum of problems in *gas turbine engine performance analysis, combustion, fluid dynamics, heat and mass transport, turbulence, and environmental pollution.*

PREVIOUS EMPLOYMENT

President and Founding Partner, ACR, Inc. (1979-present).
Manager, Advanced Technology Group, Dames & Moore (1974-1979).
Senior Research Associate, Imperial College, London, UK (1972-1974).
Assistant Professor, IIT, Kanpur (1969-1972).
Assistant Professor, Punjab Engineering College, Chandigarh (1964-65).

ACADEMIC BACKGROUND

Ph.D., London University (Imperial College), UK. , 1969
D.I.C., Imperial College, London, UK. , 1969
B.S. (Honours) in Mech. Eng., Punjab University, India, 1964

PROFESSIONAL AFFILIATIONS

Member, American Society of Mechanical Engineers
Nominated member, British Flame Research Committee

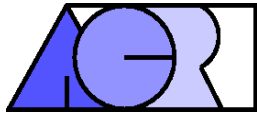
PUBLICATIONS

Heat and Mass Transfer in Recirculating Flows, Academic Press, New York, 1969. Co-authors: A. D. Gosman, W. M. Pun, D. B. Spalding, & M. Wolfshtein.

Atmospheric Pollution, Elsevier Scientific Publishing Co., New York, 1978. Ed. Michel M. Benarie.

Coupled Processes in Porous and Fractured Media, Academic Press, New York, 1986. Ed. Chin Fu Tsang.

Author or Coauthor of more than 150 publications



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Dr. Akshai K. Runchal QUALIFICATIONS AND EXPERIENCE

Combustion & CFD

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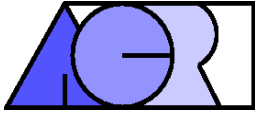
Dr. Runchal is an acknowledged and well known expert in **CFD, Combustion Modeling, and performance analysis related to combustion systems**. He has performed computer modeling and numerical simulation of flow, heat and mass transport processes for diverse problems in engineering and environmental sciences. His experience spans a range of problems including those related to design, production, operation and environmental impact of industrial and urban projects. For the past 31 years he has consulted extensively in **Computational Fluid Dynamics (CFD), Combustion, Turbulence, Environmental Pollution**, and heat and mass transfer processes.

In his professional career, Dr. Runchal has **provided services to over 200 clients on an international basis**. He has appeared as **an expert witness**. His clients have included major corporations, leading research organizations, and cities and governments in many countries. He has consulted with General Electric Aircraft Engines, Rolls-Royce, Allison Gas Turbines, Garrett- Allied Signal, Rockwell International, SNECMA, Aerospatiale, Turbomeca, GIE Hyperspace, Brown Boveri, Sulzer, Westinghouse, Exxon, Chevron, Sohio, Shell, ARCO, ARAMCO, BP, TOTAL, Bechtel, Fluor, Dames & Moore, Woodward Clyde, IBM, General Motors, Westinghouse, and FMC Corporation. He has worked extensively with research organizations such as NASA, USAF, Sandia National Laboratory, Oak Ridge National Laboratory, Idaho National Engineering Laboratory and National Academy of Sciences. During his consulting career he has worked on projects in the U.S.A., France, Belgium, the U.K., India, Germany, Holland, Sweden, Switzerland, Spain, Slovenia, Chile, Brazil, Iran, Korea, Egypt, Saudi Arabia, and Abu Dhabi.

Dr. Runchal received **his Ph.D.** in Fluid Mechanics and Transfer Processes from **Imperial College (London University, UK) in 1969** under the guidance of **Prof. D. Brian Spalding**. He received a **Bachelor of Engineering with Honors** from Punjab Engineering College (Chandigarh, India) in 1964. He **has taught in the U.S.A., India and the U.K.**. He is the co-author of a book, contributor to three books and, an author or co-author of **over 100 technical publications**. He has provided invited contributions at a number of conferences and seminars. He has delivered invited lectures in the U.S.A., Australia, Belgium, Czechoslovakia, France, Germany, India, Slovenia and the U.K. He is a regular reviewer for a number of technical journals.

Dr. Runchal has participated in the **development of a number of numerical models for computer simulation of complex problems related to fluid flow and transfer processes** in aerospace, environmental, petrochemical, power plant and manufacturing industries. He is the principal author of the ANSWER, PORFLOW, TIDAL, RADM, WQUAL and DRIFT CFD software tools. These tools are widely employed by commercial, academic and research organizations both in the U.S.A. and abroad.

Dr. Runchal is the **founder and President of Analytic & Computational Research, Inc.** He was previously employed as Manager, Advanced Technology Group, Dames & Moore,



Los Angeles, and Technical Director, CHAM, London. He occasionally teaches at UCLA and has been on the Ph.D. Thesis committees at UCLA and Caltech.

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