R E S U M E

Name : S. VAIDYANATHAN

Address for communication : **D – 15 ; PRAGATI**
No. 13 ; Varadhapuram Road
Lock Street
Chennai 600 085
INDIA

vaidyanthan.mech@sairam.edu.in
svaidya45@gmail.com
svaidya04@rediffmail.com

Contact Telephone No. : +919444021263 (Mob)

Highest Educational Qualification : **Doctor of Philosophy (Ph. D.) in Mechanical Engineering.**

Field of Interest : Power Plant design, Steam generators, Combustion, FBC, heat transfer, thermo-dynamics and gas dynamics , computational, Modeling, analysis and simulation. System and Process Engineering.

Academic Record :

DEGREE	INSTITUTE & YEAR	DIVISION & MARKS	SUBJECTS
Higher Sec 'A' Course	M.P. Board ; 1966 (Bhilai Vidyalaya) BHILAI	First - 79.7 %	Science with Mathematics
B.E. Mechanical	NIT Raipur (M.P.) – Capital of Chattisgarh Formerly GCETR 1971	First - 70.1 %	Mechanical Engineering
M.Tech.	I.I.T. Bombay 1973	First - 79 %	Thermal Power Engineering
Ph.D.	I.I.T. Bombay 1986 (*)		Fluidized Bed Combustion. Parametric study and Modeling

* Between 1973 and 1980 worked in various industries.

A. PROFESSIONAL CAREER (in reverse chronological order) :

1. Present occupation: Since June 2013 and continuing.

1. **Professor in Sairam Engineering College** - Chennai.
   Involved in teaching and other academic activities:

   Subjects handled: Thermodynamics, Heat Transfer, gas dynamics and Power Plant Engineering.

2. Consultant : Since May 2000

Field of activity :

Consultancy in **technical** software development for Thermal systems and **development in steam generators**, boilers and thermal equipment.

A. Major consultancy work done is ;

1. Software for the design and analysis of scantling of steam generator as per ASME, BS, ISO and IBR. This is one complete package and marketed by self. Written in Visual Basic linking AutoCAD

2. Computerization of ASME steam table. This is basically a thermodynamics problem written in Visual Basic and Visual C++

3. Software for the design and analysis of steam generator. This is partly in VC++ and partly in Visual Basic and includes software and hardware of boiler. It is a high level expansion of (1) including all aspects of steam generator; viz. combustion, heat transfer, fluid mechanics, engineering, structure and hardware.

4. Cycle analysis

5. Computerization of PTC 4.0

6. **Design of steam generator for bio mass. This is a consultancy work from TERI and first of its kind in India. Successfully commissioned in Dec 2003.**

7. Design and development of FBC boiler for saw dust for paper industry. **This project got the award for most efficient and environment friendly award by CII.**

8. Consultant to Southern Railway for NMR (Nilagiri Mountain Railways) for conversion of their coal fired locomotive to oil fired locomotive. **This got the award of best project in Indian Railway in the year 2002.**

9. Retained as consultant by Enmas Andritz for development of Fluidized Bed combustion systems and Computer Aided Modeling.

10. Developing models both graphic and thermal for boilers.

11. Developing water tube fluidized bed boilers.

12. **Solving problems related to 117 TPH, 105 bar AFBC boiler.**

13. Designing and analysis of high pressure utility boiler and industrial boiler along with a Doosan Babcock licensee. Major activity is technology absorption of DB (UK) and its improvement.

3. Employment :

1. Name of the organization : Enmas Process Technologies Limited. Madras

Designation : General Manager (Systems, Development, & Quality Assurance and Control)

Duration : Since Oct 1991 to 30 Apr 2000

Major Assignment : Development of fluidized bed boilers. Consultancy on large fluidized bed boilers. Developed entire CAD system for design and engineering & other packages for MIS. (See details later), and established Quality Control and Assurance Department.

Some key projects handled are :

(a) Completed consultancy work and performance analysis of a 45 tph fluidized bed boiler.

(b) Consultancy work for 65 T/h fluidized bed boiler for lignite.

(c) Complete computerization of boiler design, engineering and drawing. Developed number of packages for thermal and mechanical design and established full computer division for CAD.

(d) Associated with Two large CFBC boilers.

(e) Headed quality assurance and control department. Stream lined entire systems, documentation, while seeking approval from third party inspection.

2. Name of the Organization : Hindustan Dorr - Oliver Ltd. Bombay
Indian Joint Venture of Keeler
Dorr Oliver (USA).

Designation : Asstt. Manager (Thermal Process Div)

Duration : From 26 th May 1986 to 15 th May 1990

Major Assignment : Worked "*almost*" from the inception of department and involved in design, detailed engineering, estimation, execution, commissioning of fluosolid systems ; viz, boilers, roaster, dryer, etc.

Three very important assignments completed are :

(1) complete design and engineering of 50 T/h 80 bar 485 deg C, Bubbling fluidized bed boiler for Naively lignite. Was largely instrumental in HDO procuring this order.

(2) Design, engineering and commissioning of 300 Kg/h fluidized bed roaster for roasting chalcopyrite involving 1.5 m deep fluidized bed.

(3) Design and engineering of fluidized bed dryer for drying illuminate, a kind of mineral sand.

Item Nos. 2 and 3 are the first attempts in India.

3. Name of the Organization : Calorex India Private Ltd. Calcutta

Designation : Manager Engineering

Duration : From 1 st August 1975 to 31 st August 1980

Major Assignments : This organization was started from scratch in 1975, during the days of oil crisis by three engineers including the self, with the aim of manufacturing indigenous boilers for low grade Indian coal & other solid fuels. Calorex was the first organization in India to develop boilers without any type of foreign assistance. Main contributions to this organization are :

(1) Design development and commercialization of **Non Conventional** boiler for solid fuels such as high ash Indian coal, husk, wood, cashew nuts etc. Such boilers were exported also to neighboring countries like Nepal, Bangladesh etc.

(2) Design of cross drum water tube boiler.

(3) Design and development of prototype underfeed stoker.

(4) Design, execution, and commissioning of all welded locomotive boilers. About 15 such units were repeated by North Eastern Coal Fields ; Marghretta.

4. Name of the Organization : Thermax Ltd. Poona.

Designation : Engineer in R & D

Duration : From 1 st Nov. 1973 to 31 st Aug 1975

Major Assignments :

(1) Design development and commissioning of prototype coal fired thermic fluid heater ; called Thermopac C. This was the first attempt in India and was commercialized later.

(2) Design and development of coal fired package boiler which is regularly produced on commercial scale.

(3) Design of low ram mechanical stoker.

(4) Scaling-up the range of oil fired boilers.

5. Name of the organization : Walchandnagar Industries Ltd.

Designation : Senior Project Engineer.

Duration : From 1 st June 1973 to 30 th Oct 1973

Major Assignment : Design of 72 bar coal fired boiler with Spreader Stoker.

B. ACADEMIC ACTIVITIES :

I. TEACHING EXPERIENCE (PRIOR TO JOINING ACADEMIC STREAM)

During doctoral work, was actively involved with my supervisor in teaching at I.I.T. Bombay at undergraduate and post graduate levels for the following subjects.

S. No.	Subjects	Level
1.	Steam generators	Post graduate
2.	Thermodynamics and Combustion	Post graduate
3.	Thermodynamics	Under graduate
4.	Energy Conversion & Cycle Analysis	Under graduate
5.	Energy Conversion (lab.)	Under graduate

II. ASSISTANCE IN DISSERTATION AND HOME PAPERS

Assisted a number of graduate and post graduate students in their Home papers and Dissertation during doctoral work. Few of them are listed here.

S. No.	Projects	Level
1.	Computer aided design of power boilers	PG
2.	Simulation of solar hot water system	PG
3.	Optimization of heat exchanger	PG
4.	Fluidized bed combustion of coal	UG

C. INVITED LECTURES :

SL.NO.	INSTITUTE	SUBJECTS	HOURS	YEAR
1.	College of Engg, Goa	Steam generators & FBC	10	1986
2.	Institution of Engineers (*)	Fluidized Bed Combustion	2	1987
3.	I.I.T. Madras	Fluidized Bed Drying	6	1989
4.	I.I.T. Bombay	Fluidized Bed Combustion	3	1993
5.	I.I.T. Madras	Steam Generator Design (for PG)	12	1995
6.	National Productivity Council	Solid Fuel Combustion	3	1996
7.	I.I.T. Madras	Steam Generator Design	3	1998
8	I.I.T. Bombay	Energy Efficient Technology	3	1999
9	I.I.T. Bombay	General Project	Aug 2004 to Dec 2004	

* Organized by Directorate of Boilers (Maharashtra) & Institution of Engineers India.

D . Ph. D. Thesis : Studies on Fluidized Bed Combustion of Coal. Doctoral work consists simulation and parametric study on 650 mm dia x 2.5 m tall water cooled fluidized bed combustor designed and fabricated for this purpose. Influence of various parameters, viz ; coal particle size, inert particle size, feed rate, excess air, bed height, feed point location, air fuel ratio, etc. on bed temperature, gas concentration, and pressure, in axial and radial direction, while burning Indian coal investigated.

A comprehensive mathematical model based on flow equations were developed which was solved for zero and first order cases.

This work was further sponsored by IRDC (International Research & Development Center) Canada, and jointly pursued by IIT B, BHEL, and TUNS Canada. Now BHEL has entered in Collabo-ration for this work with Combustion Engg.

M. Tech. Dissertation : Optimization of Pipe Size with Respect to Pressure drop for the Flashing Mixtures of Steam and Water.

Experimental study was performed for the optimization of pipe size for the flow of saturated water from a high pressure feed water heater of a power plant to a low pressure heater in a regenerative cycle. A simple one dimensional model based on energy equation was also developed.

B.E. Project : Thesis on Design of Steam Turbine

Thermal design of 50 kW impulse reaction turbine. Mechanical design of major component such as rotor and cylinder was also included.

E. SPONSORED PROJECT & CONSULTANCY :

1. Fluidized bed combustion of high moisture Naively lignite (1987).

   Sponsored by Hindustan Dorr-Oliver to I.I.T. Bombay and had been the chief investigator for this project.

2. Design of plate heat exchangers for high temperature gaseous medium (1989).
   This was an independent consultancy work.

3. Complete design, detailing and engineering of Open Bottom type Fluidized Bed Boiler, from 2 t/h to 17.5 t/h (1990)

   This boiler is first of its kind in India.

4. Had been Consultant to I.I.T. Madras for their mission project on CFBC (1996 - 1997)

5. Consultant to Enmas Ahlstrom Limited for development of solid models for steam generator design.

6. Consultant to Tata Energy Research Institute (TERI) for augmenting solar thermal power plant with producer gas fired boiler.

7. **3D modeling of boilers for large power plant for a boiler manufacturing organization in Southern India where, entire engineering is linked and document is generated for production.**

8. Worked as consultant to IIT Bombay during the period from 1st August 2004 to 4th December 2004 on Projects.

F. PUBLICATIONS :

1. 'Some Computational Aspects of Radiative Heat Transfer' Sixth National Heat & Mass Transfer Conference. I.I.T. Madras (1981).

2. 'Numerical Comparison of Radiative Heat Transfer Models' , Reg J Energy Heat & Mass Transfer , v 4, n 4 (1982) pp 239 - 248.

3. 'Fluidized Bed Combustion in Energy Saving', Workshop on Fuel Conservation in Combustion Device - I.I.T. Bombay, n6, (1982).

4. 'Choice of Particle Diameter in FBC' Reg J of Energy Heat & Mass Transfer, v 11 (1), pp 61 - 66 (1987).

5. 'Role of Fluidized Bed Combustion in the Indian Context'. Energy Management , v 11 , n4 , (1987).

   This was rated as a best paper in a seminar organized by NPC and participated among others by BHEL, ISGEC, IGNIFLUID, Thermax, Cethar Vessels and other boiler manufacturers.

6. 'Parametric Study of Fluidized Bed Coal Combustion', Energy Management , Oct - Dec (1989).

7. 'Fluidized Bed Roasting of Chalcopyrite : A Wet Process'.
   Energy Management , Oct - Dec (1992).

8 'Modeling Stream Generators. An objected oriented approach '. First National Conference on Objected Oriented Technology (1997). IIT Madras

9. “Synergy between Indian Engineering Institutes and industries”, WOSA 2014, S. Vaidyanathan & A. Rajendra Prasad

10. “Simulation & Modeling of Pressure Part Scantling As per International Codes”; 2015 IEEE International Conference on Computing and Communication Technologies.

    https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7292756

11. “Design and Analysis of Compact Boiler”. International Journal of Mechanical Engineering and Technology, v 9, issue 7, July 2018, pp 1525-1534.

    https://iaeme.com/MasterAdmin/Journal_uploads/IJMET/VOLUME_9_ISSUE_7/IJMET_09_07_162.pdf

12. “Sustainable Power Generation with Fluidized Bed Combustion”, Recent Advances in Energy Technology, 2023.

https://www.springerprofessional.de/sustainable-power-generation-with-fluidized-bed-combustion/23555862

G. Computational Strength:

1) Have good knowledge and experience of working on computers. Can independently work on computers without any assistance. **One strength is knowledge of VC++, VB and 3D cad.** Some important software developed are ;

1. 3 D models of CFBC on MDT.

1. The model for circulating fluidized bed during doctoral work was developed in FORTRAN.

2. Software for power plant engineering with details for boiler as an independent Professional.

3. C & C++, OOPS : Developed model for complete piping design including pressure drop calculation in a network having different types of components and different boundary conditions.

4. VC, **VB : Have developed package for scantling design for pressure parts of boiler. This package can detail scantlings as per ASME, BSS, ISO or IBR all in one. This is being commercialized by self.**

Had been the developer for the BETA version of AutoCAD R 14 by Autodesk.

Have first hand experience of working on main frame computers, NETWORK as well as PCs; viz , CDC 3600, DEC 10 & 20, EC 3600, PDP 11, IDS, HCL and various PCs, on DOS & WINDOWS

Have developed number of packages for process engineering, structural and detailing which are not otherwise available in market. One example is P&I and instrument package developed is equivalent to PEGS & PDMS but works on PC on top of AutoCAD. Some modules developed for structural are add on modules for STADD_III .

6. Experience on solid modeling like, MDT6, Inventor, ProE, STADD, and on MATLAB.

H. Additional Qualification

Knowledge of Russian language : Have passed 3 years Diploma course
(Details as given below)

S.NO.	INSTITUTE	COURSE	MARKS
1.	University of Poona	Jr. Certificate Course	70 %
2.	Ramakrishna Mission Institute of Culture, Calcutta	**Sr. Certificate Course (First)**	**91 % (First class, First)**
3.	Ramakrishna Mission Institute of Culture, Calcutta	**Diploma Course**	**75 % (First class Second)**

Strength:

Exceptionally hard working, knowledge oriented and considerate for others point of view.

Weakness:

Do not humiliate others and do not tolerate humiliation.

I. REFERENCES :

1. **Professor S.P. Sukhatme**
Professor Emeritus and Former Director I.I.T. Bombay

Indian Institute of Technology – Bombay

Powai

Mumbai - 400 076

Email : sukhatme@me.iitb.ac.in

Professor Sukhatme was group head during my M.Tech & doctoral work

2. **Dr. Bimal Acherjee**
Kolkatta

Telephone No - 91 033 – 24363035 (Res)
Mobile : + 91 94337 60411

Email : biprach@gmail.com

Dr. B. Acherjee is an independent consultant now, and former Director of Calorex India (P) Ltd. Dr. Acherjee and self embarked on the venture of Calorex.