

Jay Vaidya

Founding President and CEO of H2Powerd LLC, 4617 Glenbrook Pkwy, Bethesda, MD 20814 Education B.E. (E): Electrical Machines and Power Major, University of Bombay, '59. D.I.I.Sc.: Industrial Engineering and Management (=MBA), I.I.Sc., '66, First Rank.

M.S.E.E.: Electrical Control Systems Major, University of Central Florida '74.

## Experience

Jay recently closed his prior business. During the past 20 years, Jay has been responsible for planning and executing several programs for product development, system analysis, fabrication, and testing of hardware relating aerospace quality electric motors, generators, and controllers. Many of these programs were under BAA's, and SBIR topics from the Department of Defense. He also designed several generators and motors for automotive, aerospace and industrial applications as a consultant to various companies. Details of some of the work successfully completed at Electrodynamics are listed at the end of the resume.

Prior to this for over 18 years from 1975, he worked for Sundstrand Aerospace at Rockford, IL, assuming positions of increasing responsibilities as Senior Project Engineer, Research Group Engineer, Advisory Engineer, Chief Research Engineer, and Engineering Manager. He focused on R&D for electric motors and generators for aerospace applications. He successfully developed air-cooled and oil-cooled generators for aircraft, and a variety of actuator motors including brushless dc, induction, and switched reluctance types. Specifics of the technologies he addressed are listed below:

### 1. Electric power generation for aircraft, and aerospace applications:

- brushless ac and dc generators (50- 150 kVA)
- permanent magnet ac generators (1- 90 kVA)
- switched reluctance generators for integrated, fault tolerant electric power ( 10- 150 kVA)

### 2. Electric motors for aerospace and military applications:

- electromechanical actuation motors in switched reluctance, induction, brushless, and hybrid types ( .25- 70 hp)
- High speed brushless dc motors (35 hp, 70000 rpm) for ECS compressors used on aircrafts.
- Liquid cooled induction motors for aircraft fuel pumps (1- 5 hp) .

### 3. Electromagnetic bearings, and magnetic couplings for aerospace drive and transmission applications.

### 4. Transformers, inductors, and filters for aircraft electrical systems.

### 5. Packaging and fabrication of electrical systems:

- Electromagnetic components
- Electronic circuits for control applications
- Power electronic converters for power conditioning and motor drives.

### 6. Selection and testing of materials and components used in aerospace electrical systems.

- Electrical insulation
- Electronic device
- Permanent magnets, and magnetic materials.

SPECIAL ASSIGNMENT: Aerospace Technical Specialty Committee for Electric Motors, Generators, and Electromagnetic Components:

I acted as the chairman of the committee formed to coordinate and address the technical issues relating to applications, specifications, design, manufacture, and testing of aerospace and industrial quality electric motors, generators, and transformers. The activities include:

1. Verification of the technical accuracy of the documents such standards, specifications, design procedures, test and inspection procedures, and manufacturing procedures.
2. Creation of a database of technical information from internal and external sources for engineering, and manufacturing technologies.
3. Implementations of improved manufacturing techniques for better quality at reduced cost.

Prior to joining Sundstrand Aerospace, Jay worked for 15 years with manufacturers of motors and generators used in textile machinery, machine tools, material handling, and mobile generating sets.

He holds 8 patents and has published 15 technical papers.

#### LIST OF PATENTS

Number Date Title

4550267 Redundant multiple channel motors and generators.

4608527 A controller for brushless dc motor.

4785242 Nov. 88 Position detecting apparatus for multiple magnetic sensor for multiple magnetic sensors for determining relative and absolute angular positions.

4847747 July 89 Three phase inverter power supply with balancing transformer.

4959605 Sep. 90 Hybrid permanent magnet and variable reluctance generator.

4983869 Jan. 91 Magnetic bearing: A hybrid magnetic bearing using permanent magnet and an electromagnet.

5039932 Aug. 91 Integrated variable reluctance generator for airframers.

5764036 Jun 98 Multiple Output Decoupled Synchronous Generator

#### LIST OF PUBLICATIONS AND PRESENTATIONS

1. Induction motors for electromechanical actuation:

Presented at High Frequency Power Distribution and Control Technology Conference, NASA Lewis Research Center, Cleveland, OH, June 1991.

2. Electromagnetic components for aerospace applications:

Accepted for presentation at the 27th Inter Society Energy Conversion Engineering Conference (IECEC), San Diego, August 1992.

3. A magnetic rotor position sensor for brushless permanent magnet motors: Presented at Motorcon, Long Beach, CA, Sept. 1987.

4. Stall torque analysis of brushless dc pm motors: Motorcon, 1986.

5. Evaluation of high-speed permanent magnet generators: IEEE/Intermag, April 1986.

6. Optimization of brushless dc motor design: Drives and Controls International, June-July, 1982.

7. Theoretical development and experimental verification of a dc-ac electronically rectified load-generator system model with common network analysis software package: Presented at IEEE/PES Winter Meeting, New Orleans, LA, February, 1987.

8. Self - regulating permanent magnet generators: Presented at IEEE/Intermag Conference, Brighton, England, June 1990.

9. Design considerations for application of permanent magnets in aerospace electric motors and generators: Presented at the International Workshop on Rare Earth Magnets, Pittsburgh, PA, October 1990.

10. Eddy current loss in toothless stator permanent magnet synchronous generators: Presented at International Conference on Synchronous Machines, Switzerland, August 1991.

11. Effect of toothless stator design on core and stator conductor eddy current losses in permanent magnet generators: Presented at the IEEE/PES Summer Power Meeting, San Diego, August 1991.

12. Electrical machines technology for aerospace power generators: Presented at the 26th Inter society Energy Conversion Engineering Conference (IECEC), Boston, MA, August 1991.

13. Motor Selection for Actuation Systems: EMCW Conference, Rosemont, IL 1995.

14. Quiet and Compact Brushless DC Motors and Controllers: Naval Symposium on Electric Machines, Newport, RI, July 1997.

15. High Power Density Electric Motor for Ship Propulsion Gas Turbine: Naval Symposium on Electric Machines, Annapolis, MD, October 98.

16. Conceptual Design of High Frequency Brushless DC Motor Drives for Naval Application.: Naval Symposium on Electric Machines, Annapolis, MD, October 98.

17. Influence of Application Characteristics of Motor Design and Construction: EMCW Conference, Rosemont, IL, 1996.

18. High Power Density Brushless PM Motor Drive for Ground Vehicle Propulsion: All Electric Combat Vehicle Conference, Bonn, Germany, September, 99.

19. Advanced Electric Generator and Control for High Speed Micro/ Mini Turbine Based Power System, PowerGen Conference, 2002.

20. Compact, Lightweight Electric Generators for Weapon Systems, DE Symposium 2003.

21. High Speed Induction Generators For Applications in Aircraft Power Systems, SAE Conference: 04PSC- 7, March 2004.

22. Electric Generator Technology Issues Relating to Directed Energy Weapon Systems in Airborne Applications, DE Symposium, October 2004.