SAMIR SALAMAH

ssalamah@nycap.rr.com · www.linkedin.com/in/samir-salamah-93490022

Experienced engineer and leader impacting the thermal design and techniques of components in the Aviation, Power and Aerospace industries for over 37 years. Over twenty-five patents and over twenty publications in the fields of thermal management and energy conversion. Passionate about mentoring and training by leveraging strong grasp of fundamental physics and physics-based thinking in advanced technical challenges

EDUCATION

PHD MECHANICAL ENGINEERING, RENSSELAER POLYTECHNIC INSTITUTE

DECEMBER 2001

Thesis topic: A Numerical Study of the Heat Transfer Due to an Array of Submerged Jets Impinging on a Moving Surface

POST-GRADUATE MECHANICAL ENGINEERING, STANFORD UNIVERSITY

1987-1993

Completed all course work toward a PhD in Mechanical Engineering

MS MECHANICAL ENGINEERING, UNIVERSITY OF CALIFORNIA, BERKELEY

MAY 1986

Thesis Topic: Numerical Simulation of Transient Behavior of an ABWR Containment Following a Postulated Guillotine Break of a Steam-carrying pipe. Formed the bases for GE Nuclear's ABWR safety simulation code.

BS THERMO-MECHANICAL ENGINEERING, UNIVERSITY OF ILLINOIS, CHICAGO

DECEMBER 1982

GPA 4.8/5.0. Graduated with Highest College Honors

EXPERIENCE

CHIEF CONSULTING ENGINEER, GENERAL ELECTRIC – RENEWABLE ENERGY

OCTOBER 2018 – JUNE 2020

From inception to validation, guided generator and thermal management designs of largest onshore (5.5MW) and offshore (12MW) Wind Turbines. Championed New Technology Introduction programs in generator technology to increase power density, and passive cooling systems. As a recognized expert in generator design and operation and in overall wind turbine thermal management, provided technical direction, translated concepts, developed strategy, and implemented changes related to generators and thermal management. Steered the IP generation and ensured GE remained competitive in generator and thermal fields. Modified thermal architecture of large onshore generator to a passive platform. Improved cost and performance.

CONSULTING ENGINEER, GENERAL ELECTRIC – RENEWABLE ENERGY

OCTOBER 2016– OCTOBER 2018

Identified knowledge gaps, proposed and drove initiatives to advance the discipline. Established and led a first-ever Thermal Management team in the GE Wind business. Championed new technologies and introduced first-ever passive cooling technology in Wind turbines using heat pipes. Provided technical leadership and consultation in the field of generators and thermal management. Guided the generator design process from idea to testing and validation, updated design practices based on field issues, and introduced technologies to improve performance. Modified conceptual design of large offshore generator and improved reliability.

PRINCIPAL ENGINEER, GENERAL ELECTRIC – GLOBAL RESEARCH CENTER

JANUARY 2015– OCTOBER 2016

Developed methods to cool Composite Matrix Composite vanes and blades for aircraft engines. Promoted comprehensive mechanical, thermal and lifing perspective for CMC component designs. Demonstrated the viability of using heat pipes in Aviation applications, such as anti-icing, CMC trailing edge thermal gradient smearing, blade tip cooling. Led thermal design of first hybrid-power aircraft engine through successful test demonstration – first in the industry. "We made aviation history". First hybrid electrical system for aircraft propulsion in GE. Target power density of 10 kW/kg at 1 MW, leapfrogging the competition. Record-breaking design time from concept to test. Successful testing at Peebles (OH) test facility.

SUB-SECTION MANAGER, GENERAL ELECTRIC – GE AVIATION

JUNE 2012– JANUARY 2015

Led team of up to 40 engineers conducting the thermal design of the most advanced aircraft engines to date: GE9X and LEAP, with up to 15% higher efficiency than their predecessors. Developed and implemented advanced cooling technologies. Successfully delivered design through conceptual validation. Provide leadership and technical direction for program tasks and personnel.

ENGINEERING MANAGER, GENERAL ELECTRIC – GE POWER

APRIL 2010– JUNE 2012

Led Generator Core Science global team of 34 engineers in 4 countries to develop new technologies (Non-metallic materials, Electromagnetics, Aero, Heat Transfer and Acoustics) that advanced competitive position by increasing generator power density. Created a test-and-learn atmosphere that spurred innovative design modifications to the generator product line. Built, trained and led global teams that went on to become organizational cornerstones. Initiated and maintained Fan Test Facility at Rensselaer Polytechnic Institute to enhance aero performance leading to two patented airfoil designs.

TECHNICAL LEADER, GENERAL ELECTRIC – GE POWER

JANUARY 2002 – APRIL 2010

Led global team of ventilation and acoustics engineers in the development and application of advanced concepts in heat transfer, fluid flow and noise simulation and reduction in support of established NPI programs, Hydro, Wind, and DMP projects. Foment team cohesiveness through inter-site projects. Deliver milestones in timely fashion. Mentored and trained all new engineers in the field of fluids and heat transfer. Reduced cycle time in major processes. Inexpensive design changes to rotor cooling confirmed via low-cost, quick testing leveraging lab upgrades to leapfrog

competition. Introduced what is now standard design methodology for fan blade design in generators. Modified IEEE acceptance criteria for 2-phase flow in Generators extending operability range

MECHANICAL ENGINEER, GENERAL ELECTRIC – GLOBAL RESEARCH CENTER

FEBRUARY 1994 – DECEMBER 2001

Managed all "CFD for Heat Transfer" projects at GRC to develop thermal design tools for GE Aviation & GE Power. Facilitated technical discussions between GRC and GE Aviation personnel to enhance aircraft engine hot-gas-path modeling capabilities. Molded the methodology for computing 3D heat transfer coefficients. Developed Best Practice for simulation of hub and shroud cavities by incorporating 3D effects. Performed first-of-a-kind simulation of heat pipes with multiple heat sinks and sources. Used CFD to design and optimize the cooling system of the most efficient gas turbine (60%) using steam from the bottoming cycle.

SENIOR ENGINEER, GENERAL ELECTRIC – GE AEROSPACE

JULY 1986 – JANUARY 1994

Technical Leader of the Direct Energy Conversion group. Devised interface and implementation of novel energy conversion systems to nuclear reactor for space applications; Thermoelectrics, Thermionics, Fuel Cells among them. Brayton, Rankine, and Sterling cycles among dynamic systems. Represented GE in multi-agency project sponsored by US government. Led thermo-hydraulics analysis and design of Space Nuclear Reactor project. Principal analyst of the Thermoelectric Electromagnetic Pump and developed concept through testing stage. Pioneered 2nd generation of thermoelectric-electromagnetic pumps that became integral to space nuclear programs. Conducted first-ever transient simulation of space reactor thawing during start-up in space.

EDISON ENGINEER, GENERAL ELECTRIC – GE NUCLEAR ENERGY

FEBRUARY 1983 – JULY 1986

Multiple rotational assignments in various Nuclear Energy groups, particularly in thermo-hydraulics area related to reactor safety systems. Transient simulations involving two-phase flow of postulated accident scenarios, such as double-ended guillotine steam pipe breaks. Graduated top-of-the-class from the Edison Program.

AWARDS

- Technical Excellence Award for thermo-hydraulic work on the SP-100 space nuclear program.
- General Manager awards
- Dushman award for major impact on a GE business product with the introduction of passive cooling to IGBT-based control system
- New Product Introduction (NPI) Team Performance award for development of cooling system in the most efficient gas turbine
- Featured in the Winter 2012 issue of the SHPE magazine
- Best Instructor in the Advanced Course in Engineering at GE
- Customer Impact Quality Award for improving wind turbine hub thermal environment
- Awarded the Estrella award by the Hispanic Forum in recognition of a career of technical achievements and contributions to GE enterprise

SKILLS

- Demonstrated clear thinker – able to solve complex technical challenges and communicate actions/solutions in clear concise manner
- Fluent in Spanish
- Strong oral and written communication skills
- Demonstrated ability to successfully coach, mentor, and guide technical team

ACTIVITIES

Instructor in GE's Advanced Course in Engineering since 1999
29 patents, 21 publications
Active member of GE's Hispanic Forum Leadership Committee
Canadian Standards Association (CSA) Member Technical Sub-Committee C22.2 No. 272 Wind Turbines – Electrical Qualification
Canadian Standards Association (CSA) Member Technical Committee on Wind Turbines (C2302)

PUBLICATIONS

PATENTS

	Patent Number	Title	Brief Description
1	US10570882B2	Dynamic active and reactive power capability for wind farms	Method for dynamically controlling real and reactive power capability of wind farm, involves communicating generator capability curve to farm-level controller of wind farm, and controlling wind farm based on generator capability curve
2	US10309242B2	Ceramic matrix composite component cooling	Ceramic matrix component airfoil for gas turbine engine, has trailing edge portion defined adjacent trailing edge at aft end, where pocket is extended within trailing edge portion and heat pipe is received in pocket
3	US8998588B2	Segmented fan assembly	Fan assembly component for segmented fan assembly of dynamoelectric machine e.g. generator, has axially outer shroud segment which is physically connected to a set of fan blades that axially extends from face of axially inner shroud segment
4	US8901790B2	Cooling of stator core flange	Dynamoelectric machine i.e. electric generator, has heat transport tubes arranged around one of two stator flanges at end of stator core arrangement to redistribute heat from flanges, where flanges maintain compressive load on arrangement

5	US8629589B2	Dynamoelectric machine coil spacerblock having flow deflecting channel in coil facing surface thereof	Gas cooled dynamoelectric machine e.g. turbo-generator, has spaceblock that includes channel arranged in coil facing surface of spaceblock for intercepting and redirecting circulating coolant flow to cavity
6	US8525376B2	Dynamoelectric machine coil spaceblock having flow deflecting structure in coil facing surface thereof	Gas-cooled dynamo-electric machine e.g. turbo-generator, has space block with flow deflector structure on cavity facing surface of space block to intercept and redirect circulating coolant flow in cavity towards central region of one cavity
7	US7893576B2	Generator coil cooling baffles	Dynamoelectric machine i.e. generator, for generating electricity, has set of subslots, and baffle arranged on set of subslots for directing coolant into set of ducts
8	US8115352B2	Dynamoelectric machine coil spacerblock having flow deflecting channel in coil facing surface thereof	Gas cooled dynamoelectric machine e.g. turbo-generator, has spaceblock that includes channel arranged in coil facing surface of spaceblock for intercepting and redirecting circulating coolant flow to cavity
9	US7808135B2	Generator having a cooling flow bifurcation member and method for controlling a cooling flow	Generator, has current branching element with surface changing current with speed, and flowing into channel into another current with another speed, where latter current is guided along external surface of end section or along flange
10	US7763996B2	Method and apparatus for cooling generators	Baffle for guiding cooling fluids in e.g. reverse flow generator, has inclined surfaces for directing specific portions of cooling fluid to flow towards flange, end stator, and angled surface of flange, respectively
11	US7557475B2	Methods and apparatus for cooling generators	Baffle for guiding cooling fluid, has inclined surface to direct portion of cooling fluid flow, where baffle controls amount of flow of cooling fluid through outside space block of power generator

12	US7541714B2	Streamlined body wedge blocks and method for enhanced cooling of generator rotor	Gas cooled dynamoelectric machine e.g. large turbo-generator, has body wedge block with leading edge apex having aerodynamic contour with gradually increasing width from leading end edge to sidewall portions
13	US7462962B2	Cooling system for an electrical machine with center rotor cooling dusts	Core cooling ventilation system for rotary electric machine e.g. generator, makes cooling medium, received from inlet ducts of stator, flow inwardly along inlet ducts of rotor and outwardly along outlet ducts of rotor into air gap
14	US7443066B2	Methods and apparatus for cooling wind turbine generators	Wind turbine generator, has heat pipe assembly with heat pipes having evaporator and condenser sections, where evaporator section absorbs heat from stator and stator windings and dissipates through condenser section
15	US7342345B2	Paddled rotor spaceblocks	Gas-cooled dynamoelectric machine e.g. large turbo-generator has spaceblocks in the endwindings with attached paddles in the form of C-channels to deflect the gas flow into an axial direction
16	US6946215B2	Molten hydride fuel cell | Molten hydride fuel cell	Fuel cell assembly has fuel cell(s) comprising anode, cathode, electrolyte, fuel gas inlet, oxidizing gas inlet and exhaust port
17	US6720687B2	Wake reduction structure for enhancing cavity flow in generator rotor endwindings	Gas cooled dynamoelectric machine such as turbo-generator includes spaceblock having side wall portions engaging adjacent end windings of rotor and downstream wall with non-planar contour
18	US6617749B2	Re-entrant spaceblock configuration for enhancing cavity flow in rotor endwinding of electric power generator	Gas cooled dynamoelectric machine such as large turbo generator has space block between adjacent end windings of rotor, whose lower wall has re-entrant contour to enhance coolant flow
19	US6506021B1	Cooling system for a gas turbine	Cooling system for turbine rotor, has circumferentially spaced manifold segments arranged on rim of rotor, which comprises recess and rib, so that spacer with recess and rib is connected to segment

20	US6495943B2	Spaceblock scoops for enhanced rotor cavity heat transfer	Gas cooled dynamoelectric machine such as turbo generator, provides scoop structure adjacent to radial inner end of cavity facing surface of space block, for intercepting and redirecting coolant flow into cavity
21	US6465917B2	Spaceblock deflector for increased electric generator endwinding cooling	Gas cooled dynamoelectric machine e.g. large turbo generators, intercepts and redirects circulating coolant flow in respective cavities towards central region of cavity by providing deflector on cavity facing space block
22	US6452294B1	Generator endwinding cooling enhancement	Gas cooled dynamo electric machine e.g. turbo generator has rotor provided with end turn whose surface facing cavity defined by space block, has non-planar surface profile
23	US6417586B1	Gas cooled endwindings for dynamoelectric machine rotor and endwinding cool method	Gas cooled dynamo-electric machine such as large turbo generator, defines outlet opening in mid-section of spaceblock, to emit cooling gas towards central region of cavity
24	US6392326B1	Flow-through spaceblocks with deflectors and method for increased electric generator endwinding cooling	Gas cooled dynamoelectric machine has spaceblocks with passage extending between adjacent cavities
25	US6334295B1	Rotating diffuser for pressure recovery in a steam cooling circuit of a gas turbine	Steam cooling circuit for use in a gas turbine that may be used in a combined cycle system, has a rotating diffuser in the spent cooling steam return passage for pressure recovery
26	US5139895A	Hydrogen thermal electrochemical converter	Hydrogen@ thermal electrochemical converter uses nuclear power heat to dissociate metal hydride which reforms in cell and operates over wide temp. range
27	US20190305646A1	ELECTRICAL WINDING TOPOLOGIES AND METHODS OF MAKING THE SAME	Electrical winding topology for thermal management system, has windings which are operatively coupled to core, in which each has evaporator section and condenser section, and portion of windings has heat pipes

28	US20140070640A1	COOLING DUCTS IN AN ELECTRO-DYNAMIC MACHINE	Generator stator core assembly, has radially extending spacer blocks and adjacent axially spaced laminations defining cooling duct, where outermost lamination includes recesses such that flow of coolant through duct flows over recesses
29	US20130300238A1	DYNAMOELECTRIC MACHINE FLANGE	Flange of dynamoelectric machine, has base section that is provided with radially facing inner surface, radially facing outer surface and slot extending axially through portion of base section

ARTICLES

1 **Numerical Comparisons of Heat Transfer from a Single Jet Emanating From a Slot Nozzle Impinging on an Isothermal Plate**
C. Tibabisco, S. Vargas-Díaz, S. Salamah
ASME 2019 International Mechanical Engineering Congress and Exposition

2 **Heat Transfer Enhancement in Narrow Diverging Channels**
J. Lamont, S. Ekkad, C. Kaminski, S. Ramesh, A. Tolpadi, S. Salamah
Journal of Turbomachinery 135(4) · June 2012

3 **Effects of Rotating Stall on an Axial Fan Design**
K. Wilt, D. Story, H. Scarton, A. Hunter, S. Salamah, S. Ramtahal
ASME 2011 Turbo Expo: Turbine Technical Conference and Exposition

4 **Generator Fan Test Facility to Quantify Axial Flow Fan Aerodynamic Performance**
A. Hunter, K. Wilt, H. Scarton, S. Salamah, D. Story
ASME 2010 Power Conference

5 **Modeling of Turbulent Heat Transfer from an Array of Submerged Jets Impinging on a Solid Surface**
S. A. Salamah, and D. A. Kaminski
Journal of Numerical Heat Transfer, Part A: Applications, Volume 48, 2005

6 **A Numerical Study of the Heat Transfer due to an Array of Submerged Jets Impinging on a Moving Surface—Laminar Flow**
S. A. Salamah, and D. A. Kaminski
6th ASME-JSME Thermal Engineering Joint Conf., TED-AJ03-395, March 2003

7 **Aeroacoustic Prediction Codes**
P. Gliebe, R. Mani, H. Shin, B. Mitchell, G. Ashford, S. Salamah, and S. Connell
NASA/CR-2000-210244

8 **SP-100 Heat Source Heat Exchanger Design**
N. Shepard, R. Biddiscombe, T. S. Chan, N. A. Deane, T. Fallas, A. S. Kirpich, R. Murata, S. Salamah, and J. D. Stephen
SPACE NUCLEAR POWER AND PROPULSION: Eleventh Symposium

9 **20-kWe Space Reactor Power System Using Brayton Cycle Conversion**
N. Shepard, R. Biddiscombe, T. S. Chan, N. A. Deane, T. Fallas, A. S. Kirpich, R. Murata, S. Salamah, and J. D. Stephen
Proc. 11th Symposium on Space Nuclear Power Systems

10 **SP100 Thermoelectric Electromagnetic Pump Performance Model**
S. Salamah, D. Miller, U. Sinha

AIP Conference Proceedings 301, 553 (1994)

11 **''HYTEC''—A thermally regenerative fuel cell**
P. Roy, S. A. Salamah, J. Maldonado, and R. S. Narkiewicz
AIP Conference Proceedings 271, 913 (1993)

12 **Experimental verification of the SP100 TEM pump analytical models**
S. A. Salamah, D. D. Miller, U. N. Sinha, and R. S. Narkiewicz
AIP Conference Proceedings 271, 689 (1993)

13 **HYTEC a high efficiency thermally regenerative fuel cell for space applications**
D. Rodgers, P. Roy, S. Salamah
AIP Conference Proceedings 246, 1310 (1992)

14 **HYTEC, high efficiency thermally regenerative power conversion for SEI missions**
S. Salamah, D. Rodgers, R. Narkiewicz, P. Roy
AIM-91-3524

15 **SP-100 scaleup to 40 MWe. AIP Conference Proceedings. 217. 1072-1081. 10.1063/1.40067.**
D. Newkirk, S. Salamah, S. Stewart, P. Pluta
Eighth Symposium on Space Nuclear Power Systems, Albuquerque, NM, AIP Conference Proceedings, No. 217

16 **SP-100 multimegawatt scaleup to meet electric propulsion mission requirements**
D. Newkirk, S. Salamah, S. Stewart, P. Pluta
Proceedings of the 24th intersociety energy conversion engineering conference. Volume 2

17 **Thermoelectric electro-magnetic pump design for the SP-100 reference flight system**
F.M. Zarghami, J.C. Atwell, S.A. Salamah, U.N. Sinha
Proceedings of the 26th intersociety energy conversion engineering conference

18 **SP-100 nuclear subsystem design**
J.D. Stephen, I.I. Falusi, H. Choe, S.A. Salamah, K.L. Lee, T.C. Osborne
Proceedings of the 23rd intersociety energy conversion engineering conference

19 **SP-100 reactor/HYTEC - A high efficiency static conversion power system**
Salamah, S.A.; Rodgers, D.N.; Hoover, D.G.; Roy, P.
Proceedings of the 26th intersociety energy conversion engineering conference

20 **Aspects of modeling fission product scrubbing in suppression pools**
F. Moody, H. Townsend, S. Salamah
ANS meeting on fission-product behavior and source term research.

21 **Pressure relaxation in a shocked bubbly mixture**
S. Salamah
ASME PVP Conference, June 1987