

Prof. Md. Zahurul Haq

Curriculum Vitae

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Research/Professional Interests

- Thermodynamics, Energy conversion and optimization,
- Combustion and Engines,
- Mechatronics and Experimental techniques,
- Refrigeration and air-conditioning (HVAC).

Current Positions

- 2004 - **Professor**, Department of Mechanical Engineering, Bangladesh University of Engineering and Technology.
- 2010 - **Member, Board of Directors**, Bangladesh Diesel Plant Ltd. (a Commercial Enterprise of Bangladesh Army).
- 2015 - **Member, Technical Advisory Committee** for Sustainable Finance Department (Green Banking Wing), Bangladesh Bank.
- 2019 - **Member, Energy Management Advisory Committee (EMAC)**, Sustainable and Renewable Energy Development Authority (SREDA), Ministry of Power, Energy and Mineral Resources, Bangladesh.
- 2021 - **Member, Technical Advisory Committee (TAC)**, Energy Efficiency and Conservation Promotion Financing Project, SREDA, Ministry of Power, Energy and Mineral Resources, Bangladesh.

Education and Qualifications

- 1993 B.Sc. Engg. (Mech), Bangladesh University of Engineering & Technology (BUET), Dhaka, Bangladesh.
- 1995 M.Sc. Engg. (Mech), Bangladesh University of Engineering & Technology (BUET), Dhaka, Bangladesh.
- 1998 Ph.D. The University of Leeds, Leeds, UK.

Membership of Associations

- Certified Energy Auditor (No. 90208), The Association of Energy Engineers (AEE), Atlanta, USA.
- Life Fellow (F7621), The Institution of Engineers, Bangladesh (IEB).
- Life Fellow (F18002 ME), Bangladesh Society of Mechanical Engineers (BSME).
- Life Member, Bangladesh Solar Energy Society (BSES).

Additional/Past Affiliations

- Feb, 2014 - Feb, 2016 **Head/Chairperson**, Dept. of Mechanical Engineering, BUET.
- Feb, 2012 - Aug, 2014 **Director**, Centre for Energy Studies, BUET.
- Sep, 2006 - Apr, 2010 **Provost**, Titumir Hall, BUET
- Nov, 2003 - Nov, 2005 **System Analyst**, Computer Centre, BUET.
- Dec, 2008 - May, 2010 **Member**, Board of Directors, Rupantarita Praktik Gas Co. Ltd. (RPGCL).
- Mar, 2007 - 2015 **Member, Project Management Board**, Haripur Gas Turbine Power Station.
- Jan, 2012 - Dec, 2015 **Chairman**, Engg. Div. Committee, Bangladesh Standards & Testing Institution (BSTI).
- Nov, 2008 - 2020 **Member, Steering Committee**, Bangladesh National Building Code (BNBC), 2020.
- Oct, 2013 - **Member, ISO PC-248/WG-3**, International Organization for Standardization (ISO).
- *ISO/CD 13065: Sustainability Criteria for Bio-energy*: **Chairman**, National Mirror Committee & **Head of Delegation** ISO ISO/PC 248 meetings
 - 23 Sept - 4 Oct 2013, Stockholm, Sweden
 - 14 - 21 Feb 2014, Berlin, Germany
 - 19 - 23 Jan 2015, Berlin, Germany
 - *Asia-Pacific Robot Contests (ROBOCON 2005-2009)*: Participating Team-Instructor for Robocon-2009, Tokyo, Japan, Robocon-2008, Pune, India, Robocon-2007, Hanoi, Vietnam, Robocon-2006, Kuala Lumpur, Malaysia, Robocon-2005, Beijing, China.

Honours and Awards

- ▶ *Commonwealth Scholarship (1995-1998)*: for Ph.D. in the UK.
- ▶ *PANASONIC Award (2005)*: Asia-Pacific Robot Contest, Robocon 2005, Beijing.
- ▶ *Certificate of Outstanding Contribution in Reviewing (October 2018)*: awarded by Energy (journal impact factor 6.082) published by Elsevier.

Research Grants

- ▶ *The Wind Energy Resource Mapping (WERM) Project for Bangladesh, 2000-2004* (Team member), funded by UNDP.
- ▶ *Development of Autonomous Mobile Robots using Locally Available Hardware Components, 2007-2008* (Project director), funded by Committee for Advanced Studies and Research (CASR), BUET.
- ▶ *Development of Design Process Simulation Lab for Teaching, Learning and Research, 2011-2012* (Team member and Alternative manager), Higher Education Quality Enhancement Project (HEQEP) Sub-project CP071, implemented by The University Grants Commission (UGC), Bangladesh.

Specialized Training/Workshop/Seminar participation

- ▶ Korea (19-27 Nov 2017): *Energy Audit Training of Trainer in Korea*, KEA-ADB partnership.
- ▶ Japan (22-29 Jul 2015): *Energy Efficiency and Conservation (EE&C) in Japan*, JICA.
- ▶ Germany (14-21 Feb 2014): *ISO 'Sustainability Criteria for Bioenergy' standard pre-seminar and ISO/PC 248 WG3 meeting*, Berlin.
- ▶ Sweden (23-29 Sep 2013): *ISO 'Sustainability Criteria for Bioenergy' standard pre-seminar*, Stockholm.
- ▶ Indonesia (3-4 Jun 2013): *Increasing Consensus & Stakeholder Engagement*, ISO Workshop, Lombok.
- ▶ Malaysia (9-13 Jul 2012): *Advanced Micro-Power System*, SERI-UKM, KL.
- ▶ India (2-22 Jul 2006): *Unigraphics NX-4 and Team-center*, UGS.
- ▶ Egypt (22-26 Jun 2002): *Laser Diagnostics of Combustion Processes*, National Institute of Laser Enhanced Sciences, Cairo University, Cairo.
- ▶ Singapore (26 Nov - 14 Dec 2001): *Mechatronics System Technology*, Japan-Singapore 3rd Country Program for the 21st Century.
- ▶ UK (29 Jun - 3 Jul 1998): *Engine Emissions Measurements*, The University of Leeds, Leeds.

Major Invited Talks

- ▶ *Grid Connected Solar: Technical and Policy Issues in Renewable Energy Policy, Regulations and Grid Connectivity Issues* [Resource Person] (2012): SAARC Workshop, 21-22 Nov, 2012, Thimpu, Bhutan.
- ▶ *Sustainability of Bioenergy* [Keynote Presentation] (2013): International Conference on Green Energy and Technology (ICGET), Aug 24-26, 2013, Kitakyushu, Fukuoka, JAPAN.
- ▶ *Thermodynamics of Power Generation: Rationale for Exergy* [Keynote Presentation] (2017): International Conference on Mechanical Engineering and Applied Sciences (ICMEAS 2017) Military Institute of Science and Technology (MIST), 21-22 February 2017, Dhaka.
- ▶ *Power Generation: Efficiency Improvement* [Resource Person] (2018): Short Training Course on *Application of Energy Saving Technologies of Residential, Commercial and Industrial Sectors in Bangladesh* organized by Centre for Energy Studies, BUET, Sept. 2018, Dhaka.
- ▶ *Energy Efficiency: Thermal* [Resource Person] [2018]: Basic Course on *Renewable Energy & Energy Efficiency: Capacity Building to Bangladesh Power Sector*, Project undertaken by a consortium led by Ricardo Energy & Environment.
- ▶ *Energy Efficient Power Technology Elements; Energy Efficient Heat Transfer Equipment; Energy Efficient Refrigeration, Air-conditioning Systems and Heat Pumps; Energy Efficient Transfer & Control Equipment* [Resource Person] [2021]: Training on *Energy Efficiency & Conservation in Textile & Industry, March 2021*, organized by Sustainable & Renewable Energy Development Authority (SREDA), Ministry of Power, Energy and Mineral Resources, Bangladesh.

Theses/Academic Project Supervision

M.Sc. Engg. Theses

- *Modeling of Flame Propagation in Biogas-Air Premixture* (M. Mizanuzzaman, 2001)
- *Experimental Investigation of Dual-Fuel Diesel Engine* (M.H. Rahman, 2003)
- *Comprehensive Modeling of Diesel Engine with Biogas/Diesel Dual Fueling for Optimized Performance* (Z.A. Bhutto, 2003)
- *Performance of a Diesel Engine with Preheated Vegetable Oil as an Alternative Fuel* (M.S. Uddin, 2005)
- *Energy-Exergy Analysis of a Diesel Engine Running of Preheated SVO (Straight Vegetable Oil)* (M.M. Islam, 2006)
- *Sesame Oil as an Alternative Fuel for Diesel Engines in Bangladesh* (A.K.M.M. Morshed, 2008)
- *Dynamic Characteristics of Servo-Controlled Mobile Robot using Optimum Pulse Width Modulation (PWM)* (M.E. Kabir, 2009)
- *Exergy Analysis of a Four Stroke Spark-Ignition Engine using Different Fuels* (M.R. Mohiuddin, 2010)
- *Development and Tuning of a PID Control System for Mobile Robot Drive* (S.M. Ali, 2011)
- *Dynamic Response of a Mobile Robot Drive Using PID Control* (Z. Aziz, 2011)
- *Energy and Exergy Based Analysis of a Multi-Fuelled SI Engine* (A. Morshed, 2013)
- *Optimum PID Control of a Servo-motor Subjected to Frictional Loads, Inertia and Disturbances* (K.A. Rahman, 2014)
- *Exergetic and Power Augmentation Analyses of Gas Turbine with Air-bottoming Combined Cycle* (M.J. Hoque, 2016)
- *Energy and Exergy Analysis of Waste Heat Recovery Systems using Organic Rankine Cycle* (A. Saha, 2016)
- *Energy Efficient HVAC Design of Buildings Using Locally Available Materials* (M.E.J. Khan, 2019)
- *Multi-Objective Optimization Of Organic Rankine Cycle Based Waste Heat Recovery Systems Using Artificial Intelligence* (R.D.A. Zayed, 2022)
- *Exergy And Thermo-Economic Study Of A 412 MW Natural Gas-Fired Combined Cycle Power Plant* (M.S. Islam, 2023)

Major Consultancy Works

- Consultation/Advisory Services for *HVAC and Building Mechanical System (BMS) for Bangabandhu Sheikh Mujibur Rahman Novo Theatre, Dhaka*, 2002-04.
- Consultation/Advisory Services for *Gas-pipeline and booster-compressor system for Mymensingh 210MW Combined Cycle Power Plant*, 2005-07.
- Design checking/vetting of *HVAC system for Franco-German Embassy in Dhaka*, 2015-16.
- Consultation/Advisory Services for *Bangladesh Industrial Energy Efficiency Opportunities Assessment*, 2012-13, ICF International Contract: AID-OAA-L-11-00003.
- *Co-creation (Design and Testing) of Biogas Socket in Bangladesh*, 2012-13, for SNV Netherlands Development Organisation.
- Consultation/Advisory Services for *Feasibility Study for Wind Power Plant at Moheshkhali, Cox's Bazar, Bangladesh*, 2014.
- Consultation/Advisory Services for *Design & Drawing for Sludge Power Generation System (SPGS) Including Re-Designed Dumping Yard (DY) of the Central Effluent Treatment Plant at Savar tannery estate*, 2016-18.
- Consultation/Advisory Services for *Implementation of a Cold-storage for Ice-cram using Waste Heat from 50 MW APSCL (Ashuganj Power Station Company Ltd.)*, 2018.
- Consultation/Advisory Services for *Air-conditioning, plumbing and fire-safety systems of Padma Oil Company Ltd.'s proposed 12+2 storied Headquarters at Paribagh, Dhaka* 2019-2020.
- National Technical Expert (Mechanical) for providing technical input and verification support of energy audit report submitted by the consultant for the project *Study on Energy Efficiency in Public Buildings (EEPB)*, 2019-21, undertaken by GIZ in cooperation with Sustainable and Renewable Energy Development Authority (SREDA), GIZ Global Project Proklima and AIIB.

Publications

PhD thesis

1. Haq, M. Z. (1998). "Fundamental Studies of Premixed Combustion". PhD thesis. School of Mechanical Engineering, The University of Leeds, Leeds, UK.

Refereed research papers (partial list)

1. Gu, X., M. Haq, M. Lawes, and R. Woolley (2000). Laminar burning velocity and Markstein lengths of methane-air mixtures. *Combustion and Flame* **121**(1), 41–58.
2. Haq, M., C. Sheppard, R. Woolley, D. Greenhalgh, and R. Lockett (2002). Wrinkling and curvature of laminar and turbulent premixed flames. *Combustion and Flame* **131**(1), 1–15.
3. Bradley, D., M. Haq, R. Hicks, T. Kitagawa, M. Lawes, C. Sheppard, and R. Woolley (2003). Turbulent burning velocity, burned gas distribution, and associated flame surface definition. *Combustion and Flame* **133**(4), 415–430.
4. Haq, M. Z. (2005a). Correlations for the Onset of Instabilities of Spherical Laminar Premixed Flames. *Journal of Heat Transfer* **127**(12), 1410–1415.
5. Haq, M. Z. (2005b). Effect of Developing Turbulence and Markstein Number on the Propagation of Flames in Methane-Air Premixture. *Journal of Engineering for Gas Turbines and Power* **128**(2), 455–462.
6. Haq, M. Z. (2021). Optimization of an Organic Rankine Cycle-Based Waste Heat Recovery System Using a Novel Target-Temperature-Line Approach. *Journal of Energy Resources Technology* **143**(9). 092101.
7. Haq, M. Z., M. S. R. Ayon, M. W. B. Nouman, and R. Bihani (2022). Thermodynamic analysis and optimisation of a novel transcritical CO₂ cycle. *Energy Conversion and Management* **273**, 116407.

Papers in conference proceedings (partial list)

1. Haq, M. (2003a). Developing Turbulence on the Propagation of Flames in Methane-Air Premixture. In: *Proceeding of the International Joint Power Generation Conference (IJPGC2003), June 15-19, 2003, Georgia, USA, Paper No. IJPGC2003-40143*. ASME.
2. Haq, M. (2003b). Prediction of Instabilities of Spherically Propagating Flames in Laminar Premixture. In: *Proceedings of the ASME 2003 Heat Transfer Summer Conference (HT2003), July 21-23, 2003, Nevada, USA, Paper No. HT2003-47484*. ASME.
3. Haq, M., M. Rahman, and Z. Bhutto (2003). Performance Studies of a Biogas Fuelled Diesel Engine Operating in a Dual Fuel Mode. In: *Proceedings of the International Conference on Power Engineering: ICOPE-2003(3)*. JSME, pp.57–62.
4. Hossain, S., M. Y. Ali, H. Jamil, and M. Z. Haq (2010). Automated guided vehicles for industrial logistics- Development of intelligent prototypes using appropriate technology. In: *Computer and Automation Engineering (ICCAE), 2010 The 2nd International Conference on*. Vol. 5. IEEE, pp.237–241.
5. Haq, M. and M. Mohiuddin (2011). Thermodynamic Analysis of a Multi-Fueled Single Cylinder SI Engine. In: *Proceedings of the ASME 2011 International Mechanical Engineering Congress and Exposition (IMECE2011), November 11-17, 2011, Denver, Colorado, USA, Paper No. IMECE2011-62423*. ASME.
6. Haq, M. Z. (2013). Sustainability of Bioenergy. In: *Proceedings of the International Conference on Green Energy and Technology (ICGET), Aug. 24-26, 2013, Kitakyushu, Fukuoka, JAPAN*. Center for Natural Science & Engineering Research. Kitakyushu, Fukuoka, JAPAN, pp.168–171.
7. Haq, M. and A. Morshed (2013). Energy and Exergy Based Analyses of a Multi-fueled SI Engine. In: *Proceedings of the ASME 2013 Power Conference, July 29-August 1, 2013, Boston, Massachusetts, USA, Paper No. Power2013-98279*. ASME.

Book chapters (partial list)

1. Haq, M. Z. (2012c). "Measurement: System, Uncertainty and Response". In: *Applied Measurement Systems*. Ed. by M. Z. Haq. InTech, 51000 Rijeka, Croatia, pp.1–22.

Book editorials

1. Haq, M. Z., ed. (2012a). *Advanced Topics in Measurements*. InTech, 51000 Rijeka, Croatia.
2. Haq, M. Z., ed. (2012b). *Applied Measurement Systems*. InTech, 51000 Rijeka, Croatia.