CURRICULUM VITAE

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Biography

Dr. Hussain has bachelors in Mechanical Engineering from NED University of Engineering & Technology, Karachi in 1989. After completing the Masters in Nuclear Engineering from Quaid-e-Azam University, Islamabad, Pakistan, he joined Karachi Institute of Power Engineering in 1991 which is an affiliated with PIEAS, Islamabad. Dr. Hussain was associated with this institute as a faculty member and researcher until 2010. In 2002, he was awarded Commonwealth Scholarship for Ph.D in Mechanical Engineering. During my Ph.D, he had designed and fabricated my combustion test rig and did a number of experiments on that rig for low grade coal combustion and gasification. He had also done CFD modeling using ANYSYS FLUENT software for combustion of coal and solid waste. During his stay in Malaysia, he was involved in a number of research projects for state owned giants like SIRIM Berhad and Tenaga Nasional Berhad. Dr Hussain moved to Saudi Arabia in December 2010 and have worked for King Abdul University at Jeddah Campus for about five years during which he acquired research funding for various research projects whose details will follow later in his resume. Dr. Hussain has recently got a US patent accepted a patent number has been issued. After his return to Pakistan in 2016, he joined as Tenure Track Professor at NED University, Karachi. He has served at various academic positions at different universities in Pakistan and abroad. Dr. Hussain has more than 16 years of post Ph.D experience and a total teaching experience of 30 years.

The Office of Research, Innovation and Commercialization (ORIC) was established in March 2018 under the supervision of Dr. Hussain. ORIC office at SZABIST has been established to provide end to end services for all matters pertaining to research & development, innovation, Inventions, commercialization, patents, collaborations, arranging seminars/ colloquia/ symposium/ conferences/ workshops, etc and/or research publication honorarium. ORIC is helping its researchers to do high quality research that will shape futures, solve real-life problems, change policies and influence practice, all to the benefit of the people of Pakistan. ORIC provides support to the faculty members in all the research programs offered by the HEC. Some of these research programs include Technology Development Fund (TDF), National Research Program for Universities (NRPU), Pak-Turk Mobility Grant, PERIDOT, which is the Franco-Pakistani Hubert Curien Partnership (PHC).

With the emerging information age, information and communication technologies, IGNITE (Formerly National ICT R&D Fund) has been created through support of Federal Government to promote research and innovation by providing research grants in three areas, viz. technical research and development, human resource development,

and innovative/commercial products. ORIC at SZABIST is coordinating with students to apply for this grant. Entrepreneurship today is a necessity rather than a luxury to accommodate new graduates in the market. YES club in SZABIST is envisioned to represent those with passion for entrepreneurship and draw attention of those who are not familiar with entrepreneurship concept. YES club intends to share a common passion for excellence in business and professional growth. YES club philosophy is continuous growth and improvement of the individuals who make up the workforce and/or create new businesses through entrepreneurial thinking. Commercialization is significant in post-research and development. ORIC intends to facilitate the faculty, students and staff in commercializing their products. ORIC has established links with the legal team that provides support in patent filing, licensing and copyrighting. Director ORIC, Dr. Ahmad Hussain, is also chairing Plagiarism Standing Committee. The committee is in the process of finalizing a fresh draft on plagiarism policy for SZABIST. The aim of this policy is to apprise students, teachers, researchers and staff about plagiarism and how it can be avoided. It is also aimed at discouraging plagiarism by regulating and authorizing punitive actions against those found guilty of the act of plagiarism.

During my stay at King Abdulaziz University, I worked as Advisor Research for two years. During this period I organized the research publications work at KAU which helped the University to climb up in QS Rankings. A number of grants were also secured during this period. Later on I was actively involved in the ABET accreditation process. I had attended an extensive course on Engineering Design-I and Engineering Design – II courses which are compulsory for every engineering undergraduate at King Abdulaziz University, Jeddah. Certificate of course participation is attached at the end of the resume. Also attended a course on "Quality standards and academic accreditation". Had a good experience of using a very handy software for preparing course files based on CLOs and Program outcomes. The program could very easily analyze all the direct and indirect assessment and could present it graphically for easy understanding. I standardize the final year or capstone design projects at KAU and developed course files for then to show continuous improvement process. This experience is now being utilized in implementing OBE in our University. Also I conduct OBE accreditation visits arranged by PEC. Currently working as Director, ORIC at Szabist, Karachi. I have initiated a number of startups at our University which is supported by private companies. Also handling a grant of about 81 Million Pak Rupees on Predictive Analytics Lab.

TEACHING EXPERIENCE

After completing MS in Power Plant Engineering, I was associated with a teaching Institute. During my long association with the institute I was involved in teaching for a number of programs which are offered at our institute. The teaching responsibilities included teaching assignments of M.S (Power Plant Engineering), one year Post Graduate Diploma for fresh engineers and Post Diploma Training Programmes for Sub-Engineers. In addition to teaching, I have also supervised a number of student's projects both at Bachelors and MS level. During my association with the institute, I had the opportunity to lead the Examination Department and made contributions towards effective student's evaluation. I also worked in the student's induction program for many years and made a number of organizational changes to attract the students to join our training programs.

My teaching expertise can be summarized according to the various areas in which I had taught at various departments/universities for the last 30 years. They are detailed as follows:

THERMAL & FLUID SCIENCES

I was involved in training of undergraduates and other engineers in the area of power plant engineering and allied disciplines so I was teaching a number of courses related to thermal fluid sciences at my previous institute and other Institutes/universities which are named below:

- Universiti Teknologi Malaysia, Johor, Malaysia
- Karachi Institute of Power Engineering, Karachi, Pakistan
- University Technology Malaysia, Johor Bharu, Malaysia
- NED University of Engineering & Technology, Karachi, Pakistan
- Dawood College of Engineering & Technology, Karachi, Pakistan
- Baharia University, Karachi, Pakistan
- NFC Institute of Engineering Sciences & Technology, Multan, Pakistan
- Quide-e-Awam University, Nawabshah, Pakistan.

I have been teaching following courses related to thermal fluid sciences at the above mentioned institutes.

- Automotive Power Plants
- Advanced Automotive Design
- IC Engines Thermodynamics
- Thermodynamics
- Thermal and Fluid Engineering
- Heat Transfer
- Applied Heat Transfer
- Thermal Engineering Measurements
- Refrigeration & Air Conditioning

- Fluid Mechanics
- Applied Fluid Mechanics
- Fluid Machinery
- Computational Fluid Dynamics

- Power Plant Systems
- Common Process Systems of a Power Plant
- Steam Generation and Steam Turbines
- Maintenance Management

- Turbo Machines and Gas Turbines
- Internal Combustion Engines
- Automotive Engineering

- Chemical Engineering Thermodynamics
- Heat and Mass Transfer
- Fluidization Engineering

- Combustion Engineering
- Aircraft Engines
- Computer Applications in Aero. Eng

In addition to regular teaching assignments, I also looked after the industrial training and attachments of the students of my and other institutes. These industrial trainings were covered under the following courses:

- Internship Training or Summer Training
- Engineering Projects or Senior Project

DESIGN, INDUSTRIAL & MATERIALS ENGINEERING

- Engineering Design-I
- Engineering Design -II
- Engineering Materials
- Strength of Materials
- Mechanics of Machines
- Manufacturing Technology
- Materials Selection in Design & Manufacturing
- Human Factors Engineering
- Industrial Safety Engineering
- Industrial Environmental Engineering
- Maintenance and Replacement Policies

ENERGY & ENVIRONMENTAL SCIENCES

During my Ph.D studies abroad, I was involved in studying the combustion of liquid as well as solid fuels. This provided me a unique opportunity to learn combustion science as well issues related to environmental pollution. Some of the courses which I had already taught at undergraduate as well as MS level are as follows:

- Combustion and Pollution
- Energy Conversion
- Renewable Energy
- Energy Technology
- Energy and the Environment
- Environmental Modeling
- Energy Planning
- Industrial Pollution Control

SUPERVISION OF SENIOR PROJECTS

During my long stay at KINPOE, I had supervised a number of projects. Some of the projects are listed below covering the variety of topics I dealt with:

- Utilization of Friction Stir Welding in Nuclear Industry
- Assessment of aging of Zr 2.5% Nb alloy pressure tube of KANUPP
- Study of Temperature Distribution for Various Intake Bays of Nuclear Power Plants Using FLUENT
- Proximate and Ultimate Analysis of Coal; An alternate energy source
- Energy Conservation Studies of Industrial Units and Identification of Guidelines to Energy Managers for Efficient Energy Savings
- Design of Thermal Loop of a Compact Reactor
- Estimation of Flow Accelerated Corrosion (FAC) in Feeder Pipes of KANUPP Using CFD Software FLUENT and Low Temperature Experimental Determination of FAC
- Critical Analyses of Pakistan Energy Policy (Power Sector) and Suggestions for Nuclear Power Integration
- High Temperature Creep Rate Measurement in Engineering Materials
- Experimental and theoretical study of pressure drop through rod bundles.
- Experimental study of flooding phenomenon using air water flow.
- Design modifications and validation of results on a double pipe heat exchanger.
- Design & Fabrication of a equipment to measure the thermal conductivity of liquids.
- Fabrication of flow boiling demonstration unit.
- Making models of PWR fuel bundle assembly, pressurizer.
- Design of pressure vessel for a PWR.
- Programming for Numerical Controlled Machines.
- Steady State of initialization of Computer Code RELAP–V/MOD3 and TRC for CHASNUPP.

Research Output/Achievement

The Predictive Analytics Lab was approved by the planning commission on 2nd April 2018. A total sum of 81.24 M PKR have been allocated for the project in which 44.11 million PKR are allocated for SZABIST Islamabad, while 37.15 million PKR are for SZABIST Karachi. Predictive Analytics Lab granted to Shaheed Zulfiqar Ali Bhutto Institute of Technology (SZABIST), Islamabad Campus to target the healthcare domain. Predictive Analysis Lab (PAL) is to be established under the umbrella of the National Center of Big Data and Cloud Computing. SZABIST is amongst the 12 selected labs that have been awarded this project to provide healthcare analytics for the following five programs working currently under the supervision of Health Department Sindh. SZABIST PA Lab is meant to apply the high masses of data generated by above-mentioned health care programs of Health, Department Sindh, Pakistan to improve healthcare quality and coordination with an increased focus on patient-centric care.

Smart Manufacturing Lab under the National Center for Big Data & Cloud Computing (NCBC) is being developed at SZABIST, Karachi. The objective of Smart Manufacturing lab is the seamless integration of everything in, and around a manufacturing operation i.e. suppliers, plants, distributors, and the products in the core

concept of Cyber-Physical Systems (CPS). Cyber-Physical Systems (CPS) are integrations of computation, networking, and physical processes. Embedded computers and networks monitor and control the physical processes, with feedback loops where physical processes affect computations and vice versa. This Lab will make use of internet of things (IOT) i.e. network of machines embedded with electronics, software, sensors, actuators, and connectivity that enables these things to connect and exchange data, thereby creating opportunities for more direct integration of the physical world into computer-based systems, resulting in efficiency improvements, economic benefits, and reduced human exertions. Thus, this lab aims at building a laboratory of technology for development and testing of innovative technologies, methods and concepts for intelligent production throughout the product's life cycle.

Pak-Turk Researchers' Mobility Grant Program is one of the upshot of Turkish-Pakistani cooperation within the scope of internationalization effort of higher education systems. It is implemented in Turkey by the Council of Higher Education (CoHE) and in Pakistan by the Higher Education Commission (HEC). The objective of this program is to develop new scientific and technological cooperation between Turkish and Pakistani higher education institutions by supporting the mobility of graduate students and academic staff. The program aims at provision of only mobility grant for any research project to be initiated at HEIs, supported by the own institution or by other donors. HEC and the Turk counterpart will provide funding for travel and living expenses to the researchers for their approved projects. Dr. Ahmad Hussain, Director ORIC have applied for a grant on the proposal titled “Coal combustion modelling using CFD techniques."

The Higher Education Commission initiated the Technology Development Fund (TDF) to finance proposals of completed interdisciplinary applied research projects for prototype development and industrial value addition for technology development. SZABIST has been shortlisted from hundreds of such applications for a project to make Documentaries Highlighting H.E.C/T.D.F Success Stories, This is the video documentary project. The documentaries will be made on the selected 33 proposals funded by Higher Education Commission Pakistan. These documentaries will cover the process of the products, their applications, important features and how these products are giving benefit to the society.

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Pakistan Institute of Engineering and Applied Sciences (PIEAS) and SZABIST jointly agreed to organize a nationwide event on BISP. The events were held in Karachi, Faisalabad and Islamabad on 14, 21, 28 April 2018 respectively. Dr. Ahmad Hussain, Director ORIC, took the lead in organizing the event at SZABIST on 14th April 2018 in Karachi. It was organized for participants from other campuses of SZABIST as well as other universities. Five (5) teams of SZABIST were shortlisted for one million PKR startup plan. The groups are in connection with the donors for their respective projects.

NRPU or National Research Program for Universities is a giant initiative by Higher Education Commission (HEC), Pakistan. In this program, creative researchers are awarded the research grants of up to 20 million. Execution period of the research project is three years maximum and a maximum of two proposals can be submitted by the researcher (Principal Investigator).In line with the idea of promoting the culture of

research and innovation, ORIC conducted a training activity on NRPU (National Research Program for Universities). This training activity was carried out in Karachi and Hyderabad campuses. In Hyderabad campus, the faculty from Larkana also joined the ORIC for the session. The ORIC is striving to have SZABIST in the NRPU program and for that, the ORIC is in continuous coordination with the faculty members to meet and discuss with the ORIC team and come up with the distinguished proposals for the submission.

ORIC has also taken initiative to apply for HEC call for National Centre for Human Nutrition in collaboration with the Head of Biosciences, to prepare the proposal and it was done with the necessary involvement of the health department of Govt. of Sindh and the proposal was submitted in due time. It has already been shortlisted for possible funding from HEC.

The ZABDESK & ZAB CMS are in-house designed software for student, staff and faculty. The specialist software is being used successfully in the SZABIST campuses across Pakistan and Dubai for many years. Within the SZABIST, its ease of use has increased user efficiency, hence the operational productivity is increased. The ZABDESK and ZABCMS software are smart solutions to the problems encountered by academic institutions on day-to-day basis, whether they are schools, colleges or universities. The ZAB Solutions package, comprising DESK and CMS has the strength to alleviate the overall functioning of the academic institution. ORIC is tasked with the responsibility to commercialize the ZABDESK and ZABCMS software, with special focus on schools and colleges as potential buyers. Once the copyright process is fulfilled, ORIC is going to establish its contact with schools and colleges across the country to identify the potential and actual buyers.

The idea of implementing the OBE was initially introduced by the ORIC. Furthermore, on the directions of Vice President Academics, ORIC-SZABIST, the initiative of the OBE was started in March 2018 and the early focus was laid on the Mechatronics Department. Initially, the mapping of the courses was done and were approved in the BoS and BoF meetings. The Self-Assessment Report (SAR) was drafted in close consultation with the internal stakeholders, covering the nine (9) accreditation criteria. Also, to fortify the back office support within the SZABIST, it was decided to conduct the ERP GAP Analysis upon the request of the Vice President (Finance) to be supervised by ORIC. The GAP Analysis is deemed significant to identify how to allocate resources or make use of the resources in the best possible fashion. It is supposed to help the SZABIST in comparing the actual performance with the potential or desired performance. The HR, Finance, Procurement, Administration and IT departments are made primary focus in the GAP analysis activity. Three organizations were contacted to conduct the GAP Analysis. Upon several departmental visits of these organizations and discussion with them, the SAP is selected to execute the auditing task.

The task to recognize the JISR - C from HEC was assigned to Dr. Ahmad Hussain in April 2018 as it had no recognition from HEC before. The task was done by indexing the journal in various agencies and the pending issues of the journal was published. Necessary upgradation were also made on the website for the JISR - C. The meeting for

the recognition of the journal was held in Islamabad on 10th May 2018 and the journal was recommended for its recognition in the "Z" category. The journal was duly recognized by the HEC during on 26th June 2018. ORIC also had the pleasure to organize the first CPD Course in collaboration with the Pakistan Engineering Council (PEC) on 30th July 2018 and it was conducted by Dr. Ahmad Hussain, Director ORIC. Dr. Faraz Junejo, HoD Mechatronics Department, collaborated with Dr. Ahmad Hussain to successfully conduct the course.

ORIC is striving hard to strengthen the research culture in all disciplines of the SZABIST to bring it at par with other institutions of higher learning within the country and abroad. It maintains the highest standards of research of both students and faculty. The ORIC has positively set the pace to match up to the challenges in the field of research and commercialization. The ORIC Office is looking forward to improve the Human Resource Development Program and explore funding for establishment of Research Labs at SZABIST in its various Departments. Special emphases will be given to strengthen international linkages in near future particularly with foreign universities based on joint research proposals for international funding. ORIC will be arranging regular scientific seminars, colloquia, symposium etc. to promote the culture of interaction and sharing of scientific knowledge with researchers around the world. ORIC will work hard in promoting entrepreneurship, technology-transfer and commercialization activities that energize and support the local and national economy and promoting and enhancing crosscutting and multi-disciplinary research initiatives. ORIC will further strengthen to provide end-to-end services for all the matters pertaining to research & development, innovation, commercialization, patent, collaborations, and for arranging seminars, symposiums, conferences and workshops, etc.

WORK EXPERIENCE (Total Teaching and Research Experience of 30 Years)

- DHA Suffa University, Karachi (April 2022 – todate)
- Hamdard University, Karachi (June 2021 – March 2022)
- King Abdulaziz University, Jeddah (Oct 2020 – May 2021)
- SZABIST, Karachi (Mar. 2018 --- July 2020)
- Hamdard University, Karachi (Nov 2017 – Feb 2018)
- NED University of Engineering & Technology, Karachi. (June 2016 – Oct 2017-1.5 years)
- King Abdulaziz University (QS Ranked 50 in Asia), Jeddah, Saudi Arabia (2011-2015 – 5 years)
- Karachi Institute of Power Engineering (KINPOE, PIEAS) (From 1991-2010-19 years)
- Faculty Member University Technology Malaysia, Johor Bharu Malaysia (2006-2007)

ACADEMICS

Ph.D (Mechanical Engineering --- Thermo-fluids)	University Technology Malaysia, Johor, Malaysia	2006
M.Sc (Nuclear Engineering)	Centre for Nuclear Studies, Pakistan Institute of Engineering & Applied Sciences, Islamabad, Pakistan	1991
B. E. (Mechanical)	NED University of Engineering & Technology, Karachi., Pakistan	1988

PROFESSIONAL AFFILIATIONS

- Member of the Accreditation Committee of the Pakistan Engineering Council to visit various engineering universities for zero visits or follow up visits and OBE accreditation visits.
- Member of the Expert Committee of HEC for Scientific and Engineering Journals – attended various meetings in Islamabad
- Registered as Professional Engineer with Pakistan Engineering Council, Islamabad, Pakistan (Life Member)
- Member, American Society of Mechanical Engineers (ASME)
- Member, Society of Petroleum Engineers (SPE), USA
- Member IASTED, Canada

30 YEARS OF PROFESSIONAL & ADMINSTRATIVE EXPERIENCE

Worked for about 20 years at Karachi Nuclear Power Complex which is first installed nuclear power plant of Pakistan. I was involved in addressing design related issues of the plant in addition to teaching professional courses related to Plant. Before coming to Saudi Arabia, I was working as Head, Mechanical Department.

1. Ph.D. Research Project on Circulating Fluidized Bed Coal Combutor

The purpose of this study is to investigate the hydrodynamic behavior and thermo chemical performance of biomass and coal blends in a Circulating Fluidized Bed (CFB), which is an upcoming technology in Malaysia. Thermochemical studies for palm shell wastes and coal blends were done in a hot circulating fluidized-bed (CFB) test rig, installed at SIRIM Berhad, Shah Alam, Experimental work has given sufficient information on the main process and flue gas characteristics. The gasification and combustion results have been plotted to study the temperature effects. The effects of variation of primary air and feed rate have also been analyzed and their influence on emissions has been established. The concentrations of CO, NOx, SO_2 and CO_2 in the flue gas were also measured to determine environmentally friendly combustion conditions.

2. Consultation Work For SIRIM Berhad, Malaysia On Municipal Waste Combustion

A consultation work was done for SIRIM Berhad, Shah Alam on the project titled **"Computer modelling of a municipal solid waste combustor for different fuel mixtures "** from May-July 2004. The work was done keeping in view that the average amount of municipal solid waste (MSW) generated in Malaysia is 0.5–0.8 kg/person/day and has increased to 1.7 kg/person/day in major cities. Due to rapid development and lack of space for new landfills, big cities in Malaysia are now switching to incineration. However, a major public concern over this technology also is the perception of the emission of pollutants of any form. Design requirements of high-performance incinerators are sometimes summarized as the achievement of 3Ts (time, temperature, and turbulence). An adequate retention time in hot environment is crucial to destroy the products of incomplete combustion and organic pollutants. Also turbulent mixing enhances uniform distributions of temperature and oxygen availability. CFD modeling has now become a useful tool for 3D modeling of the complex geometry and flow conditions in the incinerators. CFD flow simulations can enable detailed parametric variations of design variables. CFD modeling of an industrial scale MSW incinerator was done using FLUENT Ver. 6.1. The 3D modeling was based conversation equations for mass, momentum and energy. The differential equations were discretized by the Finite Volume Method and were solved by the SIMPLE algorithm. The k-ε turbulence model was employed. The meshing was done using Gambit 2.0. The cold flow simulations were performed initially to develop the flow and velocity field. Numerical simulations of the flow field inside the primary and secondary combustion chambers provided the temperature profiles and the concentration data at the nodal points of computational grids. Parametric study was also done to minimize the NOx emissions.

3. Consultation work for Tenaga Nasional Berhad, Malaysia on Combustion Simulation for Palm Olein Blended Fuel

Work related to experimental and combustion simulation was done for TNB from September 2004 – April 2005 on a project titled "**Experimental and simulations studies of combustion test firing of blended palm olein-distillate oil in laboratory combustion test rig**". Industrial gas turbine fueled by blended palm olein is a promising option for electricity generation in Malaysia. A preliminary study on combustion of blended diesel and palm olein distillate in a combustion chamber was done. The combustion of these blended oils was analyzed. The possible use of these oils in a gas turbine combustor, without modification in injection system, was also evaluated by comparing the results with diesel fuel. However, the high viscosity of blended oils can create problems at injection, but these can be addressed by preheating the mixture.

The experimental studies were conducted for 100% diesel and blending diesel with 20, 30, 40, 50 and 60% palm olein. Combustion firing was also tried for 100% palm olein. The combustion performances were evaluated for blended oil and compared with diesel. The emission of NOx ranged from 30-55 ppm while the soot emissions were higher for high blended fuel.

The CFD modeling of the combustor was also done using the CFD software FLUENT 6.1. A 3D model of the combustion test rig was modeled so that a comparison may be

made between the experimental and computational results. This can be helpful in future parametric studies of the combustor performance under different operating conditions.

A fairly good comparison between numerical simulations and experimental findings were obtained as far as the flame structure is concerned. The flow and temperature contours suggests that for fuel with lower palm olein content or high volatility, the combustion process is more uniform because of a higher rate of fuel vaporization. As the blending ratio of palm olein is increased the NOx ppm level also increased and for 2080POD, 4060POD and 5050POD it is found to be 45 ppm, 68 ppm and 122 respectively. The high ppm levels are due the slightly higher temperature profiles that may be due to better mixing conditions. However, it was found that the ppm level of NOx for 5050POD increased rapidly. The soot content is also a bit high for 5050POD, which suggest a limit for using blended fuel use in gas turbine combustor. As far as the temperature distribution, flame structure and NOx emissions are concerned; it is not useful that the palm olein blending should be used in excess of 40%. For high blended fuel, the excessive soot particles may cause damage to turbine blades.

4. Consultation Work for SIRIM Berhad, Malaysia on Combustion Studies of Oil Palm Shell Waste

A joint research project is being initiated in June 2005 between Faculty of Mechanical Engineering, UTM and SIRIM Berhad, Shah Alam to investigate efficient combustion method for solid wastes in Malaysia. Circulating fluidized-bed technology is considered to be one of the most suitable techniques to thermally convert different fuels into useful energy. However, practical experience is available for only a limited number of fuels and conditions. This study is focused to perform experimental work at a bench-scale circulating fluidized-bed (CFB) test rig, installed at SIRIM Berhad, Shah Alam, for gasification and combustion experiments using different biomass materials. The purpose of the tests is to investigate the suitability of the selected fuels for energy production using CFBC while taking care of the flue gas emissions.

5. Quality Assurance Criteria For Managers In Energy Sector

This research was done to develop energy conservation culture in our society and also prepare manpower for designated posts such as energy officers, energy auditors and energy managers. The importance of energy management and conservation will help to withstand nation in upcoming competitive industrialized global environment. Certification methodology for energy officers, energy auditors and energy managers is designed particularly for Pakistani working environment along with the accreditation of institutes in private sector which will provide training and carry out official energy audits. It will also help to develop a systematic approach for registration by the Government body like National Energy Conservation Centre (ENERCON). A typical power plant steam condenser is taken to be a reference case study as an example of thermal utility. Results were compared with plant actual data. Economic analysis is also carried out to look forward for financial benefits by applying different energy conservation techniques.

6. Nuclear Desalination

There is a grown interest in the area of nuclear desalination i.e., the production of freshwater via seawater desalination using nuclear energy using nuclear generating units. A number of countries are currently engaged in this activity. A nuclear desalination demonstration facility (4,500 m^3/d MED coupled to a PHWR) in Karachi, Pakistan is currently working under testing phase. Techno-economic feasibilities are being done to make nuclear desalination a viable option is being done now which is important for coastal countries, which are suffering or will soon suffer serious water shortages.

RESEARCH GRANTS

The following funded projects were done during my stay at King Abdul Aziz University.

i. Energy Management Studies of Faculty of Engineering at King Abdul Aziz University, Rabigh, Saudi Arabia (**SR 50,000** KAU Funded Project, Already Completed)

ii. Pyrolysis and devolatization behavior of Palm dates wastes (KAU Funding available – **SR 50,000**, Completed)

iii. Pyrolysis process development and surface chemical treatment of palm wastes based activated carbon to improve its adsorption capacity in industrial wastewater treatment process (KACST Funded Project – **2 Million SR**)

iv. Hydrodynamic and fluidization behavior in a Circulating Fluidized Bed Riser (KAU Funding Available – **SR 50,000**, Completed)

RESEARCH SUPERVISION

Ph.D Research Project:

A Ph.D student, Mr. Islahuddin (who has completed his course work requirement) is now working with me to develop his Ph.D proposal on "Portable Solar Powered Ejector Refrigeration System".

The objective of proposed research is to develop a highly efficient, portable, and solar-powered ejector refrigeration system for mobile military platforms. The proposed solar powered cooling system is based on the development of three related technological innovations:

1) a high-COP ejector refrigeration system
2) highly efficient, compact evaporators utilizing thin film evaporation;
3) state-of-the-art, "foldable" solar thermal collectors with nanofluid oscillating heat pipes and micro/nano-structured absorption surfaces.

Due to its unique features, the system will be compact, portable and highly efficient. More importantly, the proposed refrigeration system can be operated by a low-grade heat source such as solar hot water. Successful completion of the proposed research will result in a prototype of the first high-COP, mobile, solar-powered refrigeration technology for military applications, which will reduce fuel costs, transportation risks, and environmental hazards associated with existing battlefield air conditioners driven by diesel/gas generators

RECENTLY COMPLETED ME PROJECTS

Sr. No	Name of Student	Project Title	Status
1.	Burair Raza	Combustion Modelling in the Riser of a fluidized Bed Combustor for Thar Coal and its blends	Completed
2.	Muzaffar Ahmed	Design and Fabrication of Biogas System using food waste at NED University and utilization of biogas produced through anaerobic digestion process	Completed

Undergraduate Final Year Projects Recently Completed

Sr. No.	Project Title
1.	Thermogravimetric and Kinetic Study on the Pyrolytic Process of Low Grade Thar Coal.
2.	Optimization of energy consumption in dual fuel fired industrial boiler
3.	Design and Fabrication of a Circulating Fluidized Bed Combustion Test Rig for Low grade Thar Coal Combustion
4.	Study and design a solar panel and define standard method for its small scale production.
5.	CFD modelling of Fluidized Bed Combustion for Low Grade Coal available in Pakistan.
6.	Optimization of Thermochemical Energy Storage using Ammonia Looping for Concentrated Solar Power (CSP) Plants using ASPEN HYSIS
7.	Development of a novel method for recycling of industrial membranes.
8.	Design of a small single-purpose nuclear desalination system for production of 2.6 MGPD of fresh water
9.	Design of Turbine Inlet Air Cooling (TIAC) for Bin Qasim Power Station (BQPS)
10.	Designing of a Fire Fighting System for a Gas Compression Facility". Ms. GASCO Engineering will support the project.
11.	"Pyrolysis of waste plastic" which is supported by Jilani flexible packages
12.	Solar Thermal Desalination of Brackish Water

13.	Biogas plant development, design optimization, installation and development of financial cum technical model for its adoption in Sindh ”

PATENT:

Iqbal Ahmed, Ahmad Hussain, Hani Hussain Sait (2017) HIGH PERFORMANCE MINI-PUMP FOR LIQUIDS, United States Patent Application Publication, Pub. No.: US 2017/0184122 A1; Pub. Date: Jan 19, 2019

SELECTED IMPACT FACTOR JOURNALS PUBLICATIONS

1. Hani Sait, Badr Habeebullah, Nadim Turkman, Yasin Al Khatiban, Ahmad Hussain (2021) Design and Analysis of a Flat Plat Solar Powered Ejector Refrigeration System, Global Journal of Energy Technology Research Updates, DOI: http://dx.doi.org/10.15377/2409-5818.2020.07.3

2. Mahrukh, Usman Allauddin, Mohammed Ehteshamul Haque, Naseem Uddin, Ahmed Hussain (2021) A Numerical Investigation of Turbulent Flow Over Single and Tandem Square Cylinders, Mehran University Research Journal of Engineering and Technology, Vol. 40, No. 4, October 2021, p-ISSN: 0254-7821, e-ISSN: 2413-7219, DOI: https://doi.org/10.22581/muet1982.2104.xx

3. Muhammad Adeel, Abdul Hameed Memon, Syed Raheel Zafar, Saad Bin Ishtiaq, Muhammad Hassaan Ali, Ahmad Hussain (2021) Design and Performance Test of an Indigenously Fabricated Sub-sonic wind tunnel, Pakistan Journal of Scientific and Industrial Research (PJSIR), HJRS Y Category Journal, Published by PCSIR. **(Accepted for publication**)

4. Mahrukh Mahrukh, Usman Allauddin, Mohammad Ehteshamul Haque Naseem Uddin, and Ahmad Hussain (2020) A Numerical Investigation of Turbulent Flow Over Single and Tandem Square cylinders, Mehran University Research Journal of Engineering & Technology, (HEC Recognized “X” Category Journal [p-ISSN: 0254-7821, e-ISSN: 2413-7219

5. Salik Uddin Ahmed, Amjad Ali, Abdul Hameed Memon, Ahmad Hussain (2020) Policy framework for implementation of sustainable procurement practices in healthcare industry, Environment, Development and Sustainability, Published: 30 April 2020, DOI: https://doi.org/10.1007/s10668-020-00750-w

6. Asifa Bashir, Farzana Hanif, Ghazala Yasmeen, Fazal Mabood, Ahmad Hussain, Naseem Abbas, Ammar Bin Yousaf, Muhammad Aamir, Suryyia Manzoor (2019) Polyaniline based magnesium nanoferrite composites as efficient photocatalysts for the photodegradation of Indigo Carmine in aqueous solutions, Desalination and Water Treatment,164, 368-37, doi:10.5004/dwt.2019.24394, , **Impact Factor = 1.383**

7. Ahmad Hussain, Iqbal Ahmad, Mahrukh Zaidi (2019) The Importance of Seawater Intake and Its Treatment Techniques for RO Desalination Plant, Pakistan Journal of Scientific and Industrial Research, PCSIR, Scientific Information Centre. Accepted Article in Press. (HEC – Y Category Journal) Accepted 5-3-2019

8. Ahmad Hussain, Faraz Junejo, Muhammad Nauman Qureshi, Afzal HAque (2019) Hydrodynamic and combustion behavior of low-grade coals in the riser of a circulating fluidized bed combustor, NUST Journal of Engineering Sciences, Accepted Article in Press. (HEC – X Category Journal) Accepted 10-3-2019

9. Lubna Khlaid, Ahmad Hussain (2019) From Theory to Practice: Classroom Application of Outcome-Based Education in SZABIST Schools at Larkana, Pakistan, 3rd International Social Sciences and Humanities Berlin Conference, Berlin, 02-05 May, 2019

10. Ahmad Hussain, Syed Murtuza Mehdi, Amjad Ali, Muhammad Adeel, Mohammed Hassan Jabal, Farid Nasir Ani (2018)Investigation of tribological characteristics of castor oil with mineral oil blends, First online 23 October(2018), Journal of Engineering and Applied Sciences (JEAS), Vol 37 No 1 (HEC Recognized X – Category Journal)

11. Farhad Ali, Ahmad Hussain, Yasmin Nergis,, Mughal Sharif, Sadaf Faryal Shah, Absar Ahmed Khan (2018) Impact of Eutrophication on Shallow Marine Water near Karachi , Coast, Pakistan, Proceedings of the Pakistan Academy of Sciences: Pakistan Academy of Sciences B. Life and Environmental Sciences 55 (2): 27–36 (HEC – Y Category Journal)

12. Shamoon Jamshed, Shafiq Rehman Qureshi, Aqueel Shah, Ahmad Hussain (2018) Investigation of Entropy Generation Rate and its Minimization in Helical Grooved Tubes, Journal of Mechanical Science and Technology (Springer), Accepted Article. **Impact Factor = 1.194**

13. Maaz Akhtar, Sayyad Zahid Qamar, Syed Murtuza Mehdi, Ahmad Hussain (2018) Diffusion-based swelling in elastomers under low- and high-salinity brine, Journal of Elastomers & Plastics, 51 (1): 75-84, First Online 9 September 2018 **(IF = 0.783)** https://doi.org/10.1177/0095244318796622

14. Ahmad Hussain, Murtuza Mehdi, Maaz Akhtar, Farid Nasir Ani, Iqbal Ahmed (2018) Combustion Performance of Diesel Palm Olein Fuel: A Combined CFD and Experimental Approach, Arabian Journal for Science and Engineering, Volume 43, Issue 3: pp 1291–1300 https://doi.org/10.1007/s13369-017-2823-5 **Impact Factor = 0.86**

15. Ahmad Hussain, Syed Murtuza Mehdi, Amjad Ali, Muhammad Adeel, Mohammed Hassan Jabal, Farid Nasir Ani (2018) Investigation of tribological characteristics of castor oil with mineral oil blends, Journal of Engineering and Applied Sciences (JEAS), Vol 37 No. 1 **.(HEC Recognized X – Category Journal)** https://journals.uetjournals.com/index.php/JEAS/article/view/2688

16. Farhad Ali, Ahmad Hussain, Yasmin Nergis, Mughal Sharif, Sadaf Faryal Shah (2018) Impact of Eutrophication on Shallow Marine Water near Karachi Coast, Pakistan, Proceedings of the Pakistan Academy of Sciences, 55 (2): 27–36 **(HEC Recognized X – Category Journal)** http://www.paspk.org/proceedings/

17. Murtuza Mehdi, Maaz Akhtar, Ahmad Hussain, Muhammad Nauman, Dheya Shuja Alothmany, Iqbal Ahmed and Kyung-Hyun Choi (2017) Dip coated stretchable and bendable PEDOTPSS films on low modulus micro-bumpy PDMS substrate, Journal of Polymer Engineering, Published ahead of printing, https://doi.org/10.1515/polyeng-2017-0081

Impact Factor = 0.66

18. Ahmad Hussain, Murtuza Mehdi, Maaz Akhtar, Farid Nasir Ani, Iqbal Ahmed (2017) Combustion Performance of Diesel Palm Olein Fuel: A Combined CFD and Experimental Approach, Arabian Journal for Science and Engineering, **Accepted Article in Press.**
Impact Factor = 0.86

19. Yasmin Nergis, Mughal Sharif, Ahmad Hussain, Jawad A Butt1 and Yusra Tahir (2017) Reed Bed Technology and Recharging on Groundwater: Mitigating the Climate Effect of Coastal Areas, Journal of Earth Science & Climatic Change 8:7, DOI: 10.4172/2157-7617.1000406 **Impact Factor = 1.06**

20. Ahmad Hussain, Shahid Ali, Iqbal Ahmed, Jolius Gimbun, Muhammad H. Albeirutty and Zulfiqar Ahmad Rehan (2016) Microwave Reinforced Transesterification of Rubber Seed Oil Using Waste Cement Clinker Catalyst, Current Nanoscience Volume 12 (E-pub ahead of print). **Impact Factor = 1.096**

21. Syed Murtuza Mehdi,Maaz Akhtar, Ahmad Hussain (2016) CFD Study of Liquid Sodium inside a Wavy Tube for Laminar Convectors: Effect of Reynolds Number, Wave Pitch and Wave Amplitude, Mathematical Problems in Engineering , Volume 2016, Article ID 6146195, 7 pages http://dx.doi.org/10.1155/2016/6146195
Impact Factor = 1.381

22. Syed Murtuza Mehd, Maaz Akhtar, Ahmad Hussain (2016) Electromechanical Response of Dip-coated Silver Films on Micro Bumpy Polymer Surface, Arabian Journal for Science and Engineering, doi:10.1007/s13369-016-2358-
Impact Factor = 0.4

23. Zainal Abidin Yusof, Iqbal Ahmed, Ahmad Hussain (2015) Thermal Evaluation of Diesel/Hydrogen Peroxide Fuel Blend, Chemical Engineering Technology 38, No. 12, 2170–2180. **Impact Factor = 2.44**

24. Ahmad Hussain, Fouad Abulaban, Syed Khubaib, Sajjad Mubin (2015) Steady state and transient thermalhydraulic analysis of PHWR using COBRA-3C/RERTR, Iranian Journal of Science and Technology – Transaction of Mechanical Engineering, Vol. 39, No.M1, pp 233-242 **Impact Factor = 0.53**

25. Abdelkarim M. Hegab, Hani Hussain Sait Ahmad Hussain (2015) Impact of the Surface Morphology on the Combustion of Simulated Solid Rocket Motor, Mathematical Problems in Engineering Hindawi Publishing Corporation, Volume 2015, Article ID 485302, http://dx.doi.org/10.1155/2015/485302
Impact Factor = 1.381

26. Dheya Shujaa Al-Othmany, Ahmad Hussain, Essam Banoqitah (2015)High-Level Radioactive Waste Storage Feasibility for the Kingdom of Saudi Arabia Arabian Journal for Science and Engineering, ISSN 1319-8025 Volume 40 Number 1:195-203, DOI 10.1007/s13369-014-1503-y **Impact Factor = 0.4**

27. Syed Waheed ul Hasan, Ahmad Hussain (2014) Date Palm Waste Gasification in Downdraft Gasifier and Simulation using ASPEN HYSYS Energy Conversion & Management 88:693-699 **Impact Factor = 3.59**

28. Mustafa Zaidi, Imran Amin, Ahmad Hussain, Nukman Yusoff (2014) Error assessment of laser cutting predictions by semi-supervised learning, Journal of Central South University (Springer) 221: 3736−3745 DOI: 10.1007/s11771-014-2357-x **Impact Factor = 0.464**

29. Fathi Djouider, Ahmad Hussain (2014) A laboratory study of the oxidation of non toxic Cr(III) to toxic Cr(VI) by OH. free radicals in simulated atmospheric water droplets conditions: Potential environmental impact Journal of Hazardous Materials (Elsevier) 276: 19-25 **Impact Factor = 4.14**

30. Abdullah Alshehri, Ahmad Hussain, Yousof Almubarak (2014) Energy Conversion Measures in the Industries of Saudi Arabia and Development of Methodology for Certification of Energy Personnel in the Kingdom, **Energy Policy (Elsevier) 64: 203-208** **Impact Factor = 3.382**

31. Abdulkarim Hegab, Hani Hussain Sait, Ahmad Hussain, A.S. Said (2014) Numerical Modeling for the Combustion of Simulated Solid Rocket Motor Propellant, **Computers and Fluids** (Elsevier) 89: 29-37. **Impact Factor = 1.830**

32. Siti Nur Sakinah Jamaludin, S. Basri, Ahmad Hussain, Dheya Al-Othmany, F. Mustapha and Dewan Muhammad Nuruzzaman (2014) Three Dimensional Finite Element Modeling of Thermomechanical Problems in Functionally Graded Hydroxyapatite/Titanium Plate, Mathematical Problems in Engineering. **Impact Factor = 1.380**

33. Ahmad Hussain, Fouad Abolaban (2014) Nuclear Desalination: A Viable Option for Producing Fresh Water- Feasibility and Techno-Economic Studies, Life Science Journal 11(1): 301-307 **Impact Factor = 0.167**

34. Muhammad Yusuf, Abdelhamid Saoudi, Nazeeh Alothmany, Dheya Alothmany, Sameer Natto, Nurul Islam Molla, Noor Mail, Abdulraheem Abdulrahman Kinsara, Ahmad Hussain(2014) Characterization of the Optically Stimulated Luminescence nanoDot for CT Dosimetry, Life Science Journal 11. **Impact Factor = 0.167**

35. Ahmad Hussain, Iqbal Ahmed,Hani Hussain Sait, Mohamed Ismail Basayoni, Hegab, Abdelkarim Morsy Hegab, Syed Waheed, Farid Nasir Ani (2013) An Experimental and Simulation Study of Fluidization Behavior of Palm Biomass in a Circulating Fluidized Bed Riser, Industrial & Engineering Chemistry Research 52: 17529−17537 DOI**:** 10.1021/ie401856b **Impact Factor = 2.206**

36. F. A. Abolaban, M. A. Najem, Ahmad Hussain, Majdi Alnowaimi, David Bradley (2013) Improving MVCBCT image quality using a Cu target with flattening filter-free LINAC, Life Sci J 2013;10(4):1624-1628]. (ISSN:1097-8135). **ImpactFactor= 0.167**

37. Mustafa Zaidi, Imran Amin, Ahmad Hussain, Nukman Yusoff (2013) Estimation of ANN Modelling of Laser Cutting with Missing Values, La Pensee 75 (10): 159-171. **Impact Factor = 0.06**
38. Iqbal Ahmed, Ani Idris, Ahmad Hussain, Zainal A.M. Yusof, Muhammad Saad Khan (2013) Influence of Co-solvent Concentration on the Properties of Dope Solution and Performance of Polyethersulfone Membranes, **Chemical Engineering & Technology** (Wiley –VCH Verlag GmbH), 36 (10): 1-9 **Impact Factor = 1.366**

39. Skakaib, M., Iqbal, A., Rosli M. Yunus, Ani Idris, **Hussain, A.** (2013) Influence of Monosodium Glutamate Additive on Morphology and Permeability Characteristics of Polyamide Dialysis Membrane, **Journal of Applied Polymer Science, Vol. 128, Issue 5: 3346-3355 DOI: 10.1002/APP.38377 Impact Factor = 1.395**

40. Hani H. Sait, **Ahmad Hussain**, Arshad Adam Salema, Farid Nasir Ani (2012) Pyrolysis and combustion kinetics of date palm biomass using thermogravimetric analysis**, Journal of Bioresource Technology (Elsevier), 118: 382-389 Impact Factor = 4.75**

41. Abdelkarim Morsy Hegab, Hani HussainSait, Ahmad Hussain, Ashraf Balabel, Mahdi Almutawa, Fathi Djouider. Modeling Of Microscale Solid Rocket Composite Propellant. Life Sci J 2013; 10(4): 523-531]. (ISSN:1097-8135). http://www.lifescienceite.com. **Impact Factor = 0.167**
42. Mahdi AlMutawa, Ahmad Hussain, Abdekarim Morsy Hegab, Faheem Hassan Akhtar. Feasibility Studies of Solar Assisted Desalination Technology for the Coastal Areas of Rabigh Using Multi Effect Desalination Method and Its Lab-Scale Demonstration. Life Sci J 2013;10(3):2691-2697]. (ISSN: 1097-8135).http://www.lifesciencesite.com. **Impact Factor = 0.167**

43. Dheya O,Ashraf S, Ahmad H. Gamma Rays Transmission Densitometry of Distillation Columns and Development of a Computerized Expert System for Faulty Analysis, Life Sci J 2013;10(2):1613-1618]. (ISSN:1097-8135). http://www.lifesciencesite.com. 228 **Impact Factor = 0.167**

44. **Iqbal, A**., Hussain,A., I, Hasani, S.M.F., Shakaib, M., Yunus, R.M. (2012) Computational modeling for visualization of flow patterns in a membrane testing device, **Journal of Separation and Purification Technology 90: 1-9 Impact Factor = 3.52**

45. Iqbal Ahmed, Ahmad Hussain, Hani Hussain Sait (2017) High Performance Mini-Pump for Liquids, United States Patent Application Publication # US 2017/0184122 A1, Published 29 June 2017.

NON Impact Factor

46. Fareda Zeab , Uzma Ali , Ahmad Hussain (2016) A comparative study on mental health of working and non-working women in Pakistan: Stress, Journal of

Research on Humanities and Social Sciences, Vol. 6 No. 5:8-14
Indexed in SCOPUS

47. Yasmin Nergis, Mughal Sahrif, Abdul Hameed Memon, Dheya AlOthmany, Khawar Naveed, Ahmad Hussain (2016) Ecosystem Approach And Hydrological Potential Study Of Port Qasim Industrial Coastal Zone Of Karachi Pakistan, Journal of Civil and Environmental Research, ISSN (Paper)2224-5790, ISSN (Online)2225-0514, Vol. 8 No. 2: 18-26 **Indexed in SCOPUS**

48. Yasmin Nergis, Mughal Sahrif, Ahmad Hussain, Khawar Naveed, Abdul Hameed Memon (2015) Ecosystem Approach and Hydrological Potential Study of Coastal area of Thatta Sindh, Pakistan, International Journal of Environmental Geology Vol:6(2): 52-55 HEC Recognized Journal (Y-category)

49. Amber Nasreen Anjum, Dheya Shujaa Al-Othmany, Ahmad Hussain (2015) Generalization of Motivational Factors in L2 Learners, Journal: International journal of Education & Practice Vol 6, No (30): 170-177 **Indexed in SCOPUS**

50. Ahmad Hussain, Naz Islam, Abdulraheem Abduklrahman Kinsara, Fouad Abolaban (2014) Need for a Safety Culture in the Nuclear Facilities of Saudi Arabia, Middle-East Journal of Scientific Research, Volume22 Issue12, Pages 1771-1781 **Indexed in SCOPUS**

51. Yasmin Nergis, Mughal Sharif, Afzal Farooq Choudhry, **Ahmed Hussain**, Jawad Abdullah Butt (2012) Impact of Industrial and Sewage Effluents on Karachi Coastal Water and Sediment Quality, **Middle-East Journal of Scientific Research** 11 (10): 1443-1454, ISSN 1990-9233 **Indexed in SCOPUS**

52. Sait, H., **Hussain, A**., Selim, A. (2012) Experimental investigation on freezing of water falling film on vertical bank of cold horizontal tubes, **Journal of Thermal Science and Engineering Applications – ASME Transaction,** Vol. 4: 1-4 **(Indexed in SCOPUS) Cited = 1**

53. Hussain, A., Ani, F.N. and Darus, A. N. (2008). Gas-solid flow modelling in the riser of a circulating fluidised bed. **International Journal of Modelling and Simulation, 28(1), IASTED, Acta Press. Calgary, CANADA Vol. 28 (1): 85- 90 Cited =3 Indexed in SCOPUS**

54. Hussain, A., Ani, F.N., Sulaiman, N., Adnan, M. (2006). Combustion modeling of an industrial municipal waste combustor**. International Journal of Environmental Studies, Taylor and Francis, 63(3): 313-329. Indexed in Scopus Cited =3**

55. Hussain A., Ani, F.N, Darus, A.N., Mokhtar, H., Azam, S. and Mustafa, A. (2006) Thermochemical Behaviour of the Oil Palm Shell Waste in a Circulating Fluidized Bed Combustor (CFBC). **Journal of Oil Palm Research., 18(1),:210-218 Imapact Factor =0.237**

56. Hussain, A., Ani, F.N., Darus, A.N., Mustafa A. and Salema AA. (2005) Simulation studies of gas-solid in the riser of a circulating fluidized bed. **Proceedings of the 18th International Conference on Fluidised Bed Combustion, 22-25 May, Toronto, Ontario, Canada Indexed in SCOPUS Cited =3**

57. Hussain, A., Ani, F.N, Darus, A.N., Mokhtar, H. and Azam, S. (2006) Thermogravimetric and kinetic study on the pyrolytic process of oil palm solid waste. **Journal of Industrial Technology., 15 (1): 87-99** . Indexed in SCOPUS

58. Soomro, A., Samo, S.R., **Hussain, A.** (2012) Fluidization in Cold Flow Circulating Fluidized Bed System, Energy, Environment and Sustainable System, **SpringerLink, 161-173, DOI:10.1007/978-3-7091-0109-417**

59. Hussain, A., Ani, F.N. and Darus, A.N. (2005) Flow modelling to investigate the effect of riser exit geometries on the riser hydrodynamics of a CFB**. Journal of Mechanical Engineering. 34: 1-10.**

60. Hussain, A., Ani, F.N., Darus, A. N. and Ahmad, Z. (2006). Thermogravimetric and thermochemical studies of Malaysian oil palm shell waste. **Jurnal Teknologi A., 45 (A), Universiti Teknologi Malaysia.**

61. Hussain, A., Ani, F.N., Darus, A.N., Adnan, M. F. and Mustafa, A. (2006). Hydrodynamic and fluidization behaviour in a circulating fluidized bed. International Journal of Mechanical and Materials Engineering 1(1):18-23.

62. Ahmad Hussain, Dheya AlOthmany (2013) Design of Thermal Loop of a Compact Reactor, International Journal of Engineering and Advanced Technology Research Vol. 1, No. 1, pp. 1-10: Published by European Centre for Research Training and Development, UK (www.ea-journals.org)

63. Ahmad Hussain, Dheya Al-Othmany (2013) Assessment of Aging of Zr-2.5Nb Pressure Tubes for Use in Heavy Water Reactor, **Journal of Natural Sciences Research**, Vol. 3, No. 2: 98-103

64. **Ahmad Hussain**, Dheya Al-Othmany (2013) Treatment and Conditioning of Spent Ion Exchange Resin from Nuclear Power Plant, **Journal of Advances in Physics Theories and Applications**, Vol. 15: 79-89

65. Hussain, A. (2012) CFD Modeling of Grate Furnace Designs for Municipal Solid Waste Combustion, **Journal of Asian Transaction on Engineering, 2(3):41-50**

66. **Ahmad Hussain**, Hani Hussain Sait (2012) CFD Modeling of the Dry Spent Fuel Storage of a Pressurized Heavy Water Reactor **Mathematical Theory and Modeling**, Vol.2, No.10: 11-20

67. M. Bassyouni, F. H. Akhtar, **Hussain A.** and A. Umer (2012) Biodiesel Production and Investigations on the Performance of Diesel Engine Using Jatropha Oil, **Journal of Asian Transaction on Engineering, 2(3):77 - 88**

68. **Hussain, A.**, Akhtar, N. A (2011) Supervision and Evaluation Of Research Projects Of Graduate Students – Realities And Requirements, **Journal of Quality and Technology Management, Vol. VIII, Issue 2: 123-137**

69. **Hussain, A.**, Nergis, Y. (2009) Quality Characterization and Magnitude of Pollution Implication in Textile Mills Effluents, **Journal of Quality and Technology Management Vol. V(II): 27- 40**

70. Sajjad Mubin, Ammad Hassan Khan and Ahmad Hussain (2008) Performance Optimization of Industrial Municipal Solid Waste Combustors – A Need of the Day to Convert Waste to Wealth, **Journal of Pakistan Association for the Advancement of Science, 60 (12),1-10.**

71. Hussain, A.,Velautham, S. (2008) Quality Assurance Criteria for Managers in Malaysian Energy Sector, **Journal of Quality and Technology Management Vol. IV (II) 57-70**

72. Hussain, A., Ani, F. N. (2007) Biomass Utilization for Green Environment: Co-combustion of Diesel Fuel and Producer Gas in Thermal Applications, **Pakistan Journal of Scientific and Industrial Research,Vol. 50 (6):370-376 Indexed in SCOPUS**

73. Nik, W.S., Hussain, A., Ani, F.N., Darus, F.N., Ali, Noraaini, A. and Eric, T.H.B. (2006) CFD modelling of industrial furnace designs for minimising emissions. **Journal of Solid State Science and Technology Letters. 13(2): 204-205.**

74. Hussain, A., Ani, F.N., Darus, A.N., Mokhtar, H., Azam, S., Sulaiman, N., Mustafa, A. and Ahmed, J. (2005) Thermogravimetric and Thermochemical studies of oil palm shell waste. **Journal of the Pakistan Institute of Chemical Engineers. Vol. XXXIII: 1-7.**

75. Hussain, A., Ani, F.N., Darus, A.N., Mokhtar, H., Azam, S., Sarpin, Z. and Ahmed, J. (2005) Combustion studies of Malaysian oil palm shell waste in a circulating fluidised bed combustor - Influence of primary air and CFBC temperature on emissions. **Journal of the Pakistan Institute of Chemical Engineers. Vol. XXXIII: 27-39.**

76. Hussain, A. and Ani, F.N. (2004) CFD flow modelling of riser exit geometries of a circulating fluidized bed**. Mehran University Journal of Science & Technology. 24(3), pp 181-190.**

77. Hussain, A., Ani, F. N., Darus, A.N., Mustafa, A., Akhtar, N.A. and Ahmed, J. (2004) Hydrodynamic Modeling of gas solid flow in the riser of a circulating fluidised bed using CFD**. Journal of the Pakistan Institute of Chemical Engineers. Vol. XXXII: 75-82.**

78. Hussain, A., and Ani, F.N. (2004). The effect of riser exit geometer on the hydrodynamics of a circulating fluidized bed. **Mehran University Journal of Science & Technology. 24(2):141-148.**

79. Hussain, A., Ani, F. N., Akhtar, N.A., Darus, A.N., Adnan, M.F., Mustafa, A., and Ahmed, J. (2004) Combustion Modeling of Municipal Waste Combustor in Malaysia. **Journal of the Pakistan Institute of Chemical Engineers. Vol. XXXII: 1-11.**

International and National Conference Proceedings

80. Bilal Soomro, Ahmad Hussain (2016) Modelling and Simulation of diffuser augmented wind turbine, Proceedings of the 4th International Conference on Energy, Environment and Sustainable Development November 01-03. 2016, Mehran University of Engineering and Technology, Jamshoro, Pakistan.

81. Azam Usto, Ahmad Hussain (2016) Production of Biofuel by Hydrothermal Liquefaction of Date PalmSeeds, Proceedings of the 4th International Conference on Energy, Environment and Sustainable Development November 01-03. 2016, Mehran University of Engineering and Technology, Jamshoro, Pakistan

82. Abdullah Alshehri, Ahmad Hussain (2016) Need of Energy Conversion Measures in Saudi Arabia and Methodology for Certification of Energy Personnel, Proceedings of the 6th International Mechanical Engineering Congress (SIMEC-2016)-15-16 July,2016, Karachi, Pakistan.

83. M. Ihsan Ul Haq, S.M. Khubaib, Umair Khalique, Ahmad Hussain (2016) Review of clean coal technologies for mitigation of carbon footprint," Proceedings of the 4th International Conference on Environmental Horizons, Karachi, 2016.

84. Umair Khalique, M. Ihsan Ul Haq, S.M. Khubaib, Ahmad Hussain (2016) Customized maintenance strategy to reduce the greenhouse gases emissions in domestic generators," Proceedings of the 4th International Conference on Environmental Horizons, Karachi, 2016.

85. S.M. Khubaib, M. Ihsan Ul Haq, Umair Khalique, Ahmad Hussain (2016) Economic and payback period evaluation of replacement of conventional lighting system with LEDs paired with solar energy," Proceedings of the 4th International Conference on Environmental Horizons, Karachi, 2016.

86. Mumtaz Ahmad, M. Ihsan ul Haq, Naveed Hussain, M. Tayyab Muneeb, Ahmad Hussain, Azeemuddin (2015) CFD analysis of a low head micro hydro kinetic turbine for northern areas of Pakistan, MDSRC - 2015 proceedings, 14-15 November, 2015 Wah/Pakistan

87. Ahmad Hussain, Majid Almotairi (2012) Effect of changing fuels on the combustion performance of an industrial boiler. ***Proceedings of the Winter Enrichment Program- Poster Competition, King Abdullah University, Thuwal, KSA, 21-28 January, Saudi Arabia.***

88. Hani H. Sait, Ahmad Hussain (2012) Effects of Feeding Tubes Arrangement, Falling Film Behavior and Backsplash on Ice Formation around Horizontal Tubes

Bundles, ***Proceedings of the International Conference on Nuclear & Renewable Energy Resources (NuRER) 2012, 20-23 May, Istanbul, Turkey.***

89. Ahmad Hussain, Hani Sait, Afzal Haque, Sadiq Hussain (2012) Combustion Performance of Low Grade Duki Coal from Baluchistan, ***Proceedings of the UK-Pakistan Coal Conference, University of Leeds, 2-4 July, United Kingdom.***

90. Abdullah, A.S., Hussain, A., Hani, H. S. (2012) THE EXISTENCE OF ENERGY MANAGERS IN AN INDUSTRY - A Need of the Time in the Energy Starved Environment- ***Proceedings of the HEFAT 2012, 16-18 July, Malta.***

91. Sait, H. H, Hussain, A. (2011) Estimation Of Flow Accelerated Corrosion (FAC) in Feeder Pipes Using CFD Software FLUENT and its Low Temperature Experimental Determination, ***Proceedings of the Universiti Malaysia Terengganu 10th International Annual Symposium (UMTAS 2011), 11-13 July 2011., Malaysia.***

92. Hussain, A., Ahmad, S. (2010) CFD Modeling of Dry Spent Fuel Storage of a Pressurized Heavy Water Reactor, Proceedings of the 7th International Bhurban Conference on Applied Sciences & Technology, Organized by National Centre for Physics, Quaid-e-Azam University and CESAT, Islamabad., 11-14 January
93. Hussain, A. (2010) Next Generations of Nuclear Power Plants – Realities & Requirements, Proceedings of the Institution of Electrical & Electronics Engineers (IEEEP) Symposium, Organized by IEEEP, Karachi Centre, 17-18 March.

94. Hussain, A. (2010) Role of Energy Mangers in Our industry and Energy Conservation Studies for a Typical Power Plant, Proceedings of the Third National Conference on Energy Resources of Pakistan, Organized by Quaid-e-Awam University, Nawabshah, 18-20 March

95. Hussain, A., Nik, W.S., Ani, F.N., Darus, F.N., Ali, Noraaini, A. and Eric, T.H.B. (2006) CFD modelling of industrial furnace designs for minimising emissions. Proceedings of the International Conference on Solid State Science and Technology (ICSSST), 4-6 September, Kuala Terengganu, Malaysia.

96. Hussain, A., Ani, F.N, Darus, A.N., Mokhtar, H., Azam, S., Sulaiman, N. and Mustafa, A. (2006). An investigation into the thermochemical behaviour of the Malaysian oil palm shell wastes & coal blends and its combustion studies in a circulating fluidized bed. Proceedings of the International Conference on Agricultural Wastes, 21-22 March, Faculty of Environment Studies, Universiti Putra Malaysia, Serdang, Malaysia.

97. Hussain, A. and Ani, F.N. (2006) Co-Combustion of Diesel Fuel Oil and Producer Gas from Biomass Gasification for Thermal Applications. Proceedings of the Pakistan Oil Gas and Energy Exhibition 2006 (POGEE 2006), 18-19 May, Karachi, Pakistan.

98. Hussain, A., Ani, F.N. and Darus, A.N. (2006) Pyrolysis Characteristics and Kinetics of Palm Shell Waste Mixtures with Mukah Balingian Coal. Proceedings of

the International Conference on Energy and Environment (ICEE 2006), 28-30 August, Universiti Tenaga Nasional, Kajang, Malaysia.

99. Hussain, A., Ani, F.N. and Darus, F.N. (2006) Pyrolysis behaviour and kinetics of palm shell waste mixtures with low grade coal and its combustion studies in a circulating fluidised bed. Proceedings of the Seminar on Energy from Biomass 2006, Organised by Forest Research Institute of Malaysia (FRIM), 25-26 July, Kepong, Kuala Lumpur.

100. Hussain, A., Sani, W.N., Ani, F.N. and Wahid, M.K. (2006) An Investigation into the Thermogravimetric Analysis and Kinetic Parameters of the Sarawak Coal and its Blends with Oil Palm Shell Waste. Proceeding of the KUSTEM 5th Annual Seminar on Sustainability Science and Management, 2-3 May, Kuala Terengganu, Malaysia.

101. Ani, F.N., Hussain, A., Yi, L.X. and Mohamed, A.F. (2006) Combustion of diesel fuel and producer gas in thermal applications. Proceedings of the National Conference & Expo 2006 – Waste to Wealth, 10-11 July, Kuala Lumpur, Malaysia.

102. Hussain, A., Ani, F.N., Darus, A.N., Puad, M. and Katiravale, S. (2006) Thermogravimetric and Kinetic Studies of Sarawak Coals and its Blends with Oil Palm Shell Waste. Proceedings of the National Conference & Expo 2006 – Waste to Wealth, 10-11 July, Kuala Lumpur, Malaysia.

103. Hussain, A., Ani, F.N. and Darus, A.N. (2006) Thermal Behaviour of Coal/Biomass Blends during Co-Pyrolysis. Proceedings of the 1st Regional Post Graduate Conference on Engineering and Science 2006 (RPCES 2006), 26-27 July, Universiti Teknologi Malaysia, Johor Bharu, Malaysia.

104. Hussain, A., Ani, F.N. and Darus, A.N. (2006) Investigation on Co-Combustion Characteristics of Palm Shell Waste and Coal in Circulating Fluidized Bed Combustor. Proceedings of the 1st Regional Post Graduate Conference on Engineering and Science 2006 (RPCES 2006), 26-27 July, Universiti Teknologi Malaysia, Johor Bharu, Malaysia.

105. Hussain, A., Ani, F.N., Mustafa, A., Mamat, Z.A., Zardi, Z. and Aziz, A. (2005) Combustion studies of blended fuel oil as an alternative fuel for industrial gas turbines (AFTUR) and controlling NOx and soot emissions. Proceedings of the3rd Pakistan's Oil, Gas and Energy Exhibition (POGEE), 19-20 May, Karachi, Pakistan.

106. Hussain, A., Ani, F.N., Darus, A.N., Mustafa A. and Salema AA. (2005) Simulation studies of gas-solid in the riser of a circulating fluidized bed. **Proceedings of the 18th International Conference on Fluidised Bed Combustion, 22-25 May, Toronto, Ontario, Canada**

107. Hussain, A., Ani, F.N. and Darus, A.N. (2005) Fluidization characteristics of a circulating fluidized bed. Proceedings of the National Mechanical Engineering Conference (NAME '05), 18-20 May, University Teknologi Mara, Malaysia, 391-400

108. Hussain, A., Ani, F.N. and Darus, A.N. (2005) Hydrodynamics of a circulating fluidized bed. Proceedings of the International conference in recent advances in Mechanical and Materials Engineering (ICRAMME 2005), 30-31 May, University of Malaya, Malaysia.

109. Hussain A., Ani, F.N, Darus, A.N., Mokhtar, H., Azam, S., Sarpin, Z. and Mustafa, A. (2005) Experimental and numerical studies of fluidization in a circulating fluidized bed. Proceedings of the International Energy Conference, 5-7 August, Jakarta, Indonesia.

110. Hussain A., Ani, F.N, Darus, A.N., Mokhtar, H., Azam, S., Sarpin, Z. and Mustafa, A. (2005) Combustion studies of the palm shell waste powder in a circulating fluidized bed combustor (CFBC) – influence of primary air and CFBC temperature on emissions. Proceedings of the International Energy Conference, 5-7 August, Jakarta, Indonesia.

111. Hussain, A., Ani, F.N., Darus, A. N. and Mustafa, A. (2005). Experimental and computational studies of the hydrodynamics of the riser of a CFB, Proceedings of the Brunei International Conference on Engineering and Technology (BICET 2005), 15-18 August, Brunei Darussalam.

112. Azam, S., Hussain, A., Ani, F.N, Darus, A.N., Mokhtar, H., Sulaiman, N. and Mustafa, A. (2005) Utilization of oil palm shell waste in a circulating fluidized bed combustor (CFBC). Proceedings of the International Advanced Technology Congress, Universiti Putra Malaysia, 6-8 December, Kuala Lumpur, Malaysia.

113. Hussain, A., Ani, F.N. and Darus, A.N. (2004) Flow modelling to investigate the effect of riser exit geometries on the riser hydrodynamics of a circulating fluidized bed. Proceedings of the International Conference on Scientific and Engineering Computation, June 30 – July 02 Singapore.

114. Hussain, A., Ani, F.N. and Darus, A.N. (2004). Turbulence modelling of a circulating fluidized bed. Proceedings of the 17th International symposium on Analytical Science: Trends, Challenges and Opportunities, 24-26 August, 2004, Kuantan, Malaysia.

115. Hussain, A., Ani, F.N. and Darus, A.N. (2004) Simulation of Gas-Solid Flow Behaviour in the Riser Section of a circulating Fluidized Bed using Computational Fluid Dynamics Software. Proceedings of the JGSEE and Kyoto University Conference on Sustainable Energy and Environment (SEE), 1-3 December, Thailand.

116. Hussain, A., Ani, F.N. and Darus, A.N. (2004) A computational study of the hydrodynamics of a circulating fluidized bed using CFD software FLUENT. Proceedings of the 7th Asia-Pacific International Symposium on Combustion and Energy Utilization (7th APISCEU), 15-17 December, Hong Kong.

117. Hussain, A. and Ani, F.N. (2004) A computational study of gas-solid flow in the riser of a circulating fluidized bed. Proceedings of the KUSTEM 3rd annual

seminar: Role of Environment Sciences and Technology in Sustainable Development of Resources, 4-5 May, Terengganu, Malaysia.

118. Hussain, A., Ani, F.N., Adnan, M.F., Surjosatyo, A., Mustafa, A. and Nik, W.B. (2004) CFD modelling of an industrial municipal solid waste combustor. Proceedings of the Symposium of Malaysian Chemical Engineers (SOMChE 2004), December 13-14, Universiti Teknologi PETRONAS, Ipoh, Perak, Malaysia.

119. Hussain, A., Ani, F.N., Darus, A N., Mustafa, A. and Nik, W.B. (2004) Numerical study on the influence of various physical parameters over the gas solid two phase flow in the 3D riser of a circulating fluidized bed. Proceedings of the Symposium of Malaysian Chemical Engineers (SOMChE 2004), December 13-14, Universiti Teknologi PETRONAS, Ipoh, Perak, Malaysia.

120. Nik, W.B., Ani, F. N., Masjuki, H H., Hussain, A. and Bulat, K. H. (2004) Thermal stability of crop oil as energy transport media in hydraulic system. Proceedings of the Symposium of Malaysian Chemical Engineers (SOMChE 2004), December 13-14, Universiti Teknologi PETRONAS, Ipoh, Perak, Malaysia.