

Dr. SAAD S. TAWFIQ

+962•7•9606•0522

drsaad.tawfiq@gmail.com



SUMMARY

Accomplished leader and a key player in the development and rehabilitation of Iraq's industry. Contributions include technical and organizational innovations, even during times when access to foreign resources was not permitted. When entrepreneurial opportunities opened up in recent years, quickly proved ability to adapt to a new environment. Has been teaching university undergraduate and graduate courses, and supervising Masters and Doctoral candidates for two decades.

ACADEMIC DEGREES

High School Diploma Baghdad College, 1968

B.Sc., Baghdad University, 1972 (Electrical Eng.).

M. Sc. Baghdad University, 1975 (Telecommunication).

Doctor of Philosophy (Ph.D.) Sussex University, 1980 (Control Eng.).

PROFESSIONAL EXPERIENCE

Employment Chronology

- **1972:** Field Engineer in Um Qaser cement factory.
- **1973–1974:** Part time sales engineer for Thorn EMI, Dormansmith, & Delta Enfield Cables.
- **1975–1976:** Design engineer at Husham Muneer Consultancy Bureau.
- **1981–1984:** Head of the Measurement & Control Department of the 2FE initiative within the Research & Development Directorate of the Iraqi Atomic Energy Commission (IAEC).
- **1984–1988:** Head of the design & construction team for Instrumentation & control of Al-Jazzira project for Uranium purification. This is in addition to previous responsibilities.

- **1989–1991:** Head of a special team to debug the source feed system of the main isotope separation project in the Tuwaitha prototype separators & later in the Tarmya production facility.
- **1991:** Member of the Higher Committee for the Rehabilitation of Iraq's electricity power production plants.
- **1991:** Member of the Nuclear Program destruction team east of the Thirthar Lake.
- **1992–1994:** Head of the Industrial Controls Department of the Electrical Engineering Design Center (EEDC).
- **1994–2003:** Director of EEDC which was later in 1996 renamed Al-Khazin Center. Al-Khazin engaged mainly in electrical & industrial projects with an elite staff of electrical engineers.
- **2003** Private enterprise with a foreign investor established a bottled water production plant named Alpine currently in operation.
- **1981–2006:** Academic activity teaching at the University of Technology and Nahrain University.
- **2003–2007:** Director of Al-Khazin Center, now part of the Ministry of Industry & Minerals (MIM).
- **2006-2007** Freelance consultant to several power and construction contractors resident in Jordan designing and supervising projects in Iraq. Electrical designs for new Iraqi military camps supervised by AMEC.
- **2007-2009** Lead I&C consultant/designer Al-Qudus expansion project, Uruk-Baghdad joint venture, project financed and supervised by the DoD. Responsible for all BoP electrical and control detailed designs. 2xGE Frame 9 units.
- **2009-2010** I&C and electrical engineering consultant for Al-Rasheed gas turbine project.
- **2010-2012** I&C and electrical engineering consultant for Al-Qudus 3 (4xGE Frame 9)
- **2009-2012** Professor of control and electrical engineering at Al-Zaytoonah University Jordan. 2009-2013 IIE/ISRF fellowship in Jordan.
- **2012-Present** Professor of control and electrical engineering at Al-Zaytoonah University Jordan. Also consultancy for various projects in Iraq.
- **2017- Consultant** Temporary water supply system to Bessmaya Thermal Power Plant Baghdad.

Industrial Accomplishments

- Undergraduate trainee at Basrah Petroleum Company Oil fields mainly pneumatic controllers, instrumentation and communications.
- Electrical installations in Um Qaser cement factory supervision.
- Sales Engineer (Electrical) representing Thorn Lighting Ltd., Dorman Smith Ltd., and Delta Enfield Cables Ltd.

- Electrical Services designer at the Husham Munier Consultancy, Baghdad, Iraq. Projects included:
 - a. Preliminary Study of the electrical System, Agricultural complex (Baghdad).
 - b. Design of the electrical Systems (Lighting, Power and communications) of the Ministry of Foreign Affairs (Baghdad).
- Established Instrumentation and Control Department unique of its kind in Iraq as it caters for instrumentation and control projects from design to operation at the Directorate of Research and Development of the Iraqi Atomic Energy Commission (IAEC). Accomplishments include:
 - a. Full responsibility for establishing and developing the department.
 - b. As head and chief designer of the instrumentation and control group, numerous projects were under my personal supervision, especially chemical process control systems. New recruits were trained on the job.
 - c. In 1982 I introduced the first Fiber Optic link for measurement and control purposes. The first application was in the physics department to control the vacuum valve for PIG ion source operating at 30 kV. This was later expanded for the EMIS project for control and measurement at the HV platform.
 - d. Among the important projects was Al-Jazzira factory, the Uranium Purification & Chlorination plant where I personally designed the PLC-controlled and computer (PC) supervised system using intelligent loop controllers (Taylor MOD 30), PLCs and PC-30 System. The project produced the target quantities in the time allocated successfully.
 - e. Designed the control system for the production scale Uranium Chlorination plant using a modern PC based control system (PC-30).
 - f. Utilized next generation PLC's to create a network of PLC's and industrial PC's to control and supervise the chemical reprocessing plant in Tarmya which required a large scale control system.
 - g. Design, fabrication, construction and operation of instrumentation and control for numerous EMIS research and development projects. These served as first school for the instrumentation and control group as it required special dedication due to the EMIS noisy environment prone with electromagnetic interference and high voltage discharges. The result was high reliability PC based systems in accordance with international standards like the IEC and ISA.
 - h. Full responsibility and supervision of the instrumentation and control of the chemical processing pilot projects for chlorination, fluorination and purification of Uranium. This included construction of the control systems, erection and operation. The design process for I&C was mature and of high standards when the production scale projects were launched.
 - i. A member of the task force to design the special ventilation requirements for the EMIS R&D building and the device plant. The control system was designed and executed by my team.
- Among the important projects was Al-Jazzera factory, the Uranium purification & chlorination plant where I personally designed the PLC-controlled and computer (PC) supervised system using intelligent loop controllers (Taylor MOD 30) and PC-30

System. I was also fully involved in the Electromagnetic Isotope Separation (EMIS) projects where several difficulties arose, such as the burnout of the feed oven heaters & melt down of wiring systems which I resolved as EMIS was going to the production phase. Several advanced systems were employed, like fiber optic links to the HV platform, advanced microprocessor controllers for the ovens & holders, PLC's for the cooling systems, etc. I introduced the first Fiber Optic link for control purposes to control a PIG experiment in the Physics Department. This was later expanded for the EMIS project for control and measurement at the HV platform.

- In 1991 after the Gulf war I was member of the rehabilitation committee of the electricity sector. My responsibility was control systems and Instrumentation. All types of systems were revamped or repaired for different types of power stations, thermal, gas turbines and hydroelectric.
- Rehabilitation of Dura refinery, Baiji refinery and Nasir foundry, Al-Qaqa Nitric acid plants were all part of the scope of work where instrumentation and control is concerned.
- Rehabilitation and reprogramming and operation of control system of the Sutton 2500 ton press for producing aluminum sections at UR-Nassiria.
- Design and realization of the control system of the thick copper rod factory at Al-Shahid Amria (Faluja).
- Design and realization of the control system of the Al-Sumud Steel Rolling mill.
- Design of a PLC controller for the sugar syrup separators in the beat root sugar factory in Mosul.
- Rehabilitation of the instrumentation and control of Boiler No. 1 in Al-Hartha power station.
- Design, construction and installation of motor drives and control for the Baghdad clock and the peripheral clocks. 1994.
- Design, construction and installation of 14th July suspension bridge temperature acquisition system 1995.
- Rehabilitation of unit No. 1 control system of Al-Musaib TPS, which required redesign of several cards due to obsolete components. System consisted of 1780 electronic cards (had to be remanufactured), 59 CPUs, 4179 input signals and 3920 output signals.
- Rehabilitation and maintenance of UPS systems for various customers (1KVA – 200 KVA) including two 200 KVA units.
- Rehabilitation of control systems and drives of Khalid bin Al-Waleed 1500 ton floating crane which required redesign of all control systems and DC motor drives with the addition of a PLC system for added flexibility, safety and reliability. Also, instrumentation of angle and weight measurement.
- Rehabilitation and maintenance of numerous power systems for induction furnaces ranging from mains frequency to RF for applications such as melting, annealing and welding at several sights in Iraq.
- Design and construction of industrial battery chargers 10A-150A, 24V, 48V and 110V for power stations and industrial plants.

- Design and construction of transformer rectifier systems for cathodic protection system for the oil industry. Also for steel reinforcement of Basrah airport with a data acquisition system to collect potential and injected current data over the vast area of the airport.
- Design, installation and operation of instrumentation and control system of two 10000-b/day refineries in Sinia and Nassiria.
- Rehabilitation of control system, AVR's, Excitation systems, UPS, boiler field instrumentation and installation of in house developed data acquisition system for the following power stations: Baiji, Nassiria, Dura, Taji, Khor Al-Zubair and Najaf. Personal supervision and direct responsibility as member of the higher committee for rehabilitation.
- Design, installation and operation of control system of concentrated nitric acid plant. Data acquiring system and compressor vibration monitors were designed and built due to unavailable recorders and vibration monitor system. Also, control system for oleum production plant.
- Design and construction of the control system and power supplies for the Ion Implanter Project at Al-Tahadi Company, 1998.
- Design and construction of switch mode power supplies of the Al-Hijab jamming Pod.
- Design and construction of the control system and power supplies for the Ion Enhanced Coating project.
- Design and construction of a PC based control system for the ESR Furnace in Al-Sumud Company. The project required acquiring the know how of the ESR process. This was obtained locally by studying the available literature and previous runs of the Electro Slag Remelting furnace.
- IN 2003, and by personal effort, Al-Khazin was moved from MIC to the Ministry of Industry & Minerals to help in the rehabilitation of Iraq. We are currently involved in the rehab of several of Iraq power stations where our experience is put to full use. Al-Khazin is currently working on a privatization scheme.
- Rehab of Najaf power station with Flour. 2004/2005.
- Rehab of Khor Al-Zubair power station with Perini.
- Installation and commissioning of the instrumentation and control systems for two V92.4 160MW gas turbine power generators in Baiji with Olbriecht and Westinghouse/Siemens. (2004/2005)
- Rehab of the boilers, emergency generator, and water intake pumps in Qudus power plant. (2005/2006)
- Basic and detailed design for the balance of plant facilities and systems of Dibis power plant for Power Machine (a Russian company). (2006)
- Design and consultation for the I & C of the Qudus extension project. Adding two frame 9 GTG. (2006/2007).
- Design and supervision of the electrical designs for the balance of plant facilities at Al-Qudus Expansion Project. (2007/2008).

PUBLICATIONS

Academic Publications

- “System Identification Applied to selected practical system”, M. Sc. Thesis 1975.
- “Optimal control of a crane”, D. Phil thesis 1980.

Research Papers

- “Experimental Crane Control”, I.E.E. conference on martial handling 1978
- “Gas Sold Fluidized beds for Domestic Air-Conditioning”, IAEC, Iraqi/Romanian conference Tuwaith 1983.
- “Manipulator Analysis and Control” Iraqi research council, Electronic research center, conference on Industrial Applications, 1986.
- “Implementation of a self-tuning regulator on a practical flow loop”, ISMM conference, Switzerland, 1990.
- “Time Optimal Control of a Torsion shaft”, Instrumentation and control J., 1991.
- “Design Procedures in PC3 Projects”, conference on procedures for design and construction of future industrial projects, Ministry of Industry, 1992.
- “Kinematics Analyses and Interfacing for an Articulated manipulator”, Engineering and technology journal, 1992.
- “Control systems in Nassirya TPS”, third symposium on reconstruction of electricity sector, Baghdad, 1992.
- “Drum level measurement system for Nassirya TPS”, fourth scientific conference for electricity and industry sectors, 1993.
- “Orifice flow meter sizing and computations”, IAEC, directorate 3000, 1982.
- “Ultrasonic level measurement system”, IAEC, directorate 3000, 1984.
- “Auto correlation flow measurement”, IAEC, directorate 3000, 1985.
- “Control system design package (CSP)”, IAEC, directorate 3000, 1984.
- “CAMAC PID controller”, IAEC, directorate 3000, 1986.
- “Optimal sampling”, IAEC, directorate 3000, 1985.
- “Source oven set-point controller”, IAEC, PC3, 1988.
- “Fault tree analysis for P101”, IAEC, directorate 3000, 1985.
- “Hall probe calibration oven controller”, IAEC, directorate 3000, 1982.
- “Adaptive and self tuning controllers”, IAEC, directorate 3000, 1987.
- “Path planning and control of robot arm using neural network”, first specialized conference in control, Engineering and Technology journal, 1999.

- “Replacement control system for Gas-turbine generating unit type GE frame-5”, U.O.T., sixth Iraqi Technology conference on computer applications and information technology, 2000.
- “Using a Micro controller for computation of load limits of Khalid Bin Al-Waleed 350t floating crane”, U.O.T., sixth Iraqi technology conference on computer applications and information technology, 2000.
- “Elevator control by using programmable logic controllers”, U.O.T., sixth Iraqi technology conference on computer applications and information technology, 2000.
- “Expert system for fault diagnosis of electrical machines by using neural network” U.O.T., third national conference on computers, communications and control systems engineering, 2002.
- “CSTR control using N.N.” U.O.T., third national conference on computers, communications and control system engineering, 2002.
- “Design of sliding mode controller for oscillatory systems”, Baghdad second Iraqi conference on technology, electrical engineering and applications, 1996.
- “Sliding Mode control using a PLC”, Baghdad, Third Iraqi conference on technology electrical engineering and application, 1997.
- “Electromagnetic compatibility”, IEE, Delta journal, India 2002.
- “Shielding of electronic components”, IEE, Delta journal, India, 2002.
- “Nonlinear Modeling and Control of Overhead Traveling Crane by Fuzzy Logic Controllers” To be published.

Reports and Articles

- “Special Ventilation for nuclear projects”, IAEC, 1984.
- “Basic design report for project P266”, PC3, 1988.
- “Document handling procedure for I&C design”, directorate 3000, IAEC, 1985.
- “Technical report for (FAT) testing of control panels for P212 (Al-Jazzira), project”, PC3, 1988.
- “Technical report for (FAT) testing of interlock and sequencing PLC system of P212 (Al-Jazzira) project”, PC3, 1988.
- “Technical report for (FAT) testing of the PC control system for project P244, PC3, 1989.
- “Control and measurement report for project P101”, IAEC, 1984.
- “Control and measurement report for projects P102, P103”, IAEC, 1985.
- “Wiring procedure and design documents for source ovens and holders of project P104”, PC3, 1988.
- “Wiring procedure and design documents for source ovens and holders of project P112”, PC3, 1989.

- “Wiring procedure and design documents for source ovens and holders of project P116”, PC3, 1990.
- “Bajji fertilizer plant boiler report”, Ministry of Industry and Minerals, Deputy Minister Office, 1992.
- “Report on the computer control systems for Shirkat new SCD sulfur plant”, Ministry of Industry and Minerals, Deputy Minister Office, 1992.
- “Report on the solution to the computer problem at Shirkat SCD sulfur plant”, General establishment for the production of sulfur, 1992.
- “Feasibility report on the use of Hartha TPS control systems (Unit 2& 3) for Musaib TPS units 1 & 2”, The general establishment for electricity production, 1992.
- “Control Options Report for the special steel rolling mill project”, Deputy Head of MIC, 1993.
- “Technical report on the design difficulties in the thick copper rod production project”, MIC, Al-Shaheed factory, 1992.
- “Technical report on the firebrick lining of ovens in the thick copper rod production project”, MIC Technical Directorate, 1992
- “Control and measurement report for the Mini refineries project”, Saad state Company, 1999.
- “Al-Khazin center development”, Saad state Company. 1999.
- “New Heel Angle measurement system for the Giant Khalid Bin Al-Waleed floating Crane”, Iraqi ports administration, 1999.
- “Design report for Switch mode power supplies for a kofman source”, Al-Khazin center, 1999.
- “Design report for power supplies for the Ion implement”, Al-Khazin center, 1999.
- “Design report for power supplies for Al-Hijab Jammer project”, Al-Khazin center, 1999.
- “Design report for Dispatch PC control system for Al-Meshtal substation”, General Company for Electricity Projects, 1996.
- “Report on protection system for Dura TPS”, MOE, 2000.
- “Control system for a 200MW Boiler a design report”, Heavy industries Company, 2000.
- “A study on the control of the main dispatch center and substations in Al-Qaqa Company”, Al-Qaqa Company, 2000.
- “Operating manual for Ababil launcher training system”, Bin Firnas Company, 2000.
- “Ion implanter control system”, Al-Tahadi Company, Al-Khazin center, 2000.
- “Rehabilitation report of the open loop control system of Unit NO.1, Al-Musaib TPS”, Al-Khazin center, 2000.
- “Design Report for the Control System for the Electro Slag Remelting Furnace in Al-Sumud Company”, MIC Minister’s Office, Al-Khazin, 2002.

- “Living in Iraq before, during & after Saddam”, the Crimson, Harvard University, 2004
- “Several notes on the rehabilitation of the electricity sector”, NYT, 2004.
- ISG Final Report Google Dr. Saad Shakir Tawfiq.

ADDITIONAL INFORMATION

Education

- High School Diploma, Baghdad College, 1968
- B. Sc., Baghdad University, 1972 (Electrical Engineering)
- M. Sc., Baghdad University, 1975 (Telecommunication)
- Ph.D., Sussex University, UK 1980 (Control Engineering)

Decorations

- Decorated for outstanding achievements in the nuclear program Jaber Bin Hayan Bronze medal 1981-1987.
- Decorated for outstanding achievements in the nuclear program Jaber Bin Hayan Gold medal 1987-1991.
- Decorated for outstanding achievements in the rehabilitation of the electricity sector in 1992 Gold Medal.
- Decorated for scientific achievements in 1996.
- Decorated and recognized as an achieved scientist in 1998, 2001, 2002.
- Co-author of the FFCD1996 and later the CAFCD 2002.

Academic Contributions

- Supervised 43 M.S. students and 6 Ph.D. students.
- Lectured the following topics at the University of Technology and Nahrain University:
 - a. Process control (4th year)
 - b. Electrical Measurements (3rd year)
 - c. Control theory (4th year)
 - d. Circuits Analysis (1st year)
 - e. System Identification and Modeling (M. Sc.)
 - f. Robotics (M. Sc. + Ph. D.)
 - g. PLC systems (M. Sc. + Ph. D.)
 - h. Computer Control (M. Sc.)

Affiliations

- Member of the ISA
- Founding member of IEDC (NGO)
- Member of IEEE