



Usama Masaud ELGHAWI  
Tel: 091 799 8005

أسامة مسعود الغاوي

## Board of Directors, Libyan Atomic Energy Establishment

### Education

Name, place and country	From- To	Level of Education Degrees	Main course of study
Birmingham University, the UK	Oct.2005- May 2009	Doctorate Ph. D.	Mechanical Engineering
Technical University of Budapest Hungary	Feb.1997- July 1999	Master M.Sc.	Nuclear Engineering branch of nuclear techniques and extended my study to Chemical Engineering branch of light industry
Tripoli University, Tripoli-Libya	Oct. 1978- July 1983	Bachelor B. Sc.	Nuclear Engineering

### Other activities:

#### I awarded three IAEA fellowships, interregional training course and a scientific visit.

- I awarded One year fellowship in low energy PIXE, ATOMKI, Debrecen-Hungary, May/1989-May/1990.
- I awarded one-month interregional training course in application of PIXE, ED-XRF and NAA in monitoring the environment, Vienna – Austria, Zagreb – Croatia, and Bratislava – Slovakia, 1994.- I awarded Six months fellowship in INAA, Atom Institute, Vienna – Austria, March to September 1996.
- I awarded Six months fellowship in Psedocyclic NAA, Dollhouse University, Halifax – Canada, May to November 2003.
- I awarded a scientific visit to National Nuclear Energy Agency of Indonesia, Center of Radioactive Waste Technology, 17-21 December 2018.

- I gave a presentation to the Libyan – German (GRS) – IAEA Workshop on Nuclear Security Issues, “Libyan National Radioactive Waste Storage, the Requirements”, 15-18 October 2012, Munich, Cologne, Germany.
- I gave a presentation to the second Regional Workshop on Collaboration on Radioactive Waste Management in the Arab Countries, organized by Arius and the IAEA with the AAEA, Hammamet -Tunisia, 12- 14, November 2012.
- I gave a presentation to the Interregional Workshop on Elaborating and Implementing a Model System for DSRS Management, Bosnia and Herzegovina - Sarajevo, 25-29 March 2013.
- I gave a presentation to the Interregional Workshop on the Design and Application of Management System for Pre-Disposal Activities Relating to, DSRS, Tunisia - Tunis, 26-30 May 2013.
- I had participated in Interregional Workshop on Management Options for DSRS of Category 3-5, including a partial demonstrations of conditioning procedures, Rabat – Morocco, 25-28 June 2013.
- I gave a presentation to German Libyan Cooperation on Nuclear Security, Management of Disused Sealed Radioactive Source (DSRS): Libyan Experience, 26-30 August 2013, (GRS) Cologne, Germany.
- I had participated in Interregional Workshop on Borehole Disposal Concept Implementation Plan, Tirana – Albania, 7-11 October 2013.
- I gave a presentation to INT9176 Coordination Meeting, Status of Libya in managing DSRS, Vienna – Austria, 21-24 October 2013.
- I gave a presentation to Interregional Workshop on Implementation of Policy and Strategy for the Control of DSRS in Libya, Nicosia – Cyprus, 11-15 November 2013.
- I had attended Interregional Workshop Meeting on Regulatory Requirement to Ensure Safe Disposal of DSRS for Operation and Regulation, Amman – Jordan, 7-11 April 2014.
- I had participated in IAEA Meeting for the Review and Completion of the Policy and Strategy Document for the Management of DSRS in Libya, Vienna, Austria, 27-29 May 2014.
- I had participated in IAEA Meeting to Share Experiences on the Implementation of the IAEA Guidance on the Import and Export of Radioactive Sources, Vienna, Austria, 10-12 March 2015.
- I gave a presentation to Interregional Workshop on Implementation a national cradle to grave control system for radioactive sources, Vienna, Austria, 13-17 May 2017.
- I had participated in IAEA, US department of energy Training course on Search and Secure of Orphan Sources, Cairo, Egypt 9-13 April 2017.
- I gave a presentation to, Meeting on the development, revision and implementation of the safety case and safety assessment, Indonesia, 15 – 19 May 2017.
- I had attended IAEA, Interregional Meeting on Transport Safety Standards and Processes for Radioactive Sources, Vienna, Austria, 28 to 31 August 2017.
- I had participated in IAEA, Workshop on Derivation of Specific Clearance Levels for Materials That Are Suitable for Disposal in Landfills, IAEA Headquarters Vienna, Austria, 27–29 November 2017.- I gave a presentation to, TC Meeting on conditioning and consolidation of DSRS inventories, Nicosia, Cyprus, 7 May 2018 - 11 May 2018.
- I gave a presentation to, Interregional Meeting on Updating Safety Cases for Radioactive Waste Management, Arusha, United Republic of Tanzania, from 2 to 6 September 2019.
- Participated in Technical Meeting on **Forum on Safety of Near Surface Disposal**, Group one “Use of the Safety Case in Decision Making”, Vienna, 7 to 11 October 2019.
- workshop on strategic planning for research reactors, which was held at the headquarters of the International Atomic Energy Agency (IAEA) in Vienna, 14-17, Oct. 2024

### **Selected Publications:**

- (1) **U. M. El-Ghawi**, B. M. Bahal and S. K. Al-Arbi, (1992). Possibility of using Low Energy Proton Beam for PIXE Microanalysis, International Journal of Radiation Research, Vol. 131, 243-248.
- (2) **Usama M. El-Ghawi**, (1993). PIXE Microanalysis of Very Low Z Elements by Sub MeV Proton Beam, International J. of PIXE, Vol.3, no.2, 109-120.
- (3) **Usama El-Ghawi**, Nóra Vajda and György Pátzay, (1999). Determination of Some Trace Elements in Natural and Fertilized Soils using INAA and ED-XRF, J. of Radioanalytical and Nuclear Chemistry, Vol. 241, no. 3, 605
- (4) **Usama El-Ghawi**, György Pátzay, Nóra Vajda and Dénes BÓDIZS, (1999). Analysis of Selected Fertilizers for

- Major, Minor, and Trace Elements using ICP-OES and INAA, *J. of Radioanalytical and Nuclear Chemistry*, Vol. 242, no. 3, 693.
- (5) I.O. Abugassa, S. B. Sarmani and **U. M. El-Ghawi**, (2004). Instrumental neutron activation analysis based on  $k_0$  - standardization method as compared with other methods in the analysis of the IAEA inter-comparison test, *J. of Radioanalytical and Nuclear Chemistry*, Vol. 259, no. 3, 381.
- (6) **U. M. El-Ghawi**, S. M. Al-Fakhri, A. A. Sadeq, M. M. Bejey and K. K. Doubali, (2004). Analysis of Libyan Arable Soils by Means of Thermal and Epithermal NAA, *The Arabian J. for Science and Engineering*, Vol. 30, no. 1A, 147-153.
- (7) **U. M. El-Ghawi**, (2005). The Level of Trace Elements in Tripoli City Groundwater, *Instrumentation Science and Technology*, Vol. 33, Issue 5, 609-617.
- (8) **U. M. El-Ghawi**, A. A. Al-Sadeq, M. M. Bejey and M. B. Alamin, (2005). Determination of Selenium in Libyan Food Items using Pseudocyclic INAA, *Biological Trace Element Research*, Vol. 107, 61-71.
- (9) **U. M. El-Ghawi**, and A. A. Al-Sadeq, (2006). Determination of Iodine in Libyan Food Samples using Epithermal INAA, *Biological Trace Element Research*, Vol. 111, 31-40.
- (10) **U. M. El-Ghawi**, S. M. Al-Fakhri, A. A. Al-Sadeq, M. M. Bejey and K. K. Doubali, (2007). The Level of Selenium and other Trace Elements in Different Libyan arable Soils Using INAA, *Biological Trace Element Research*, Vol. 119, no. 1, 89-96.
- (11) **U. Elghawi**, K. Theinnoi, S. Sitshebo, A. Tsolakis, M. Wyszynski, and H. Xu, F. Cracknell, R. Clark, and A. Mayouf, (2008). GC-MS Determination of Low Hydrocarbon Species (C1 – C6) from a Diesel Partial Oxidation Reformer, *International Journal of Hydrogen Energy*, Vol. 33, no. 23, pp. 7074-7083.
- (12) **U. Elghawi**, J. Misztal, A. Tsolakis, M. Wyszynski, and H. Xu., (April 2009). GC-MS Speciation and Quantification of 1,3-Butadiene and Other C1-C6 Hydrocarbons in SI/HCCI V6 Engine Exhaust, *SAE International Journal of Fuels and Lubricants*, Vol. 1, no. 1, pp. 1-11.
- (13) S. Sitshebo, A. Tsolakis, **U. Elghawi**, K. Theinnoi, and M. Wyszynski, (2009). Hydrogen Rich Gas Production in a Diesel Partial Oxidation Reactor with HC Speciation, *SAE Technical paper*, no. 2009-01-0276.
- (14) **U. Elghawi**, A. Mayouf, A. Tsolakis and M. Wyszynski, (2010). Vapour-Phase and Particulate-Bound PAHs Profile Generated by a (SI/HCCI) Engine from Winter Grade Commercial Gasoline, *Fuel*, vol. 89, page 2019-2025.
- (15) Taha S. Massuod, Feisal Abuttweirat and **Usama Elghawi** (2012). Chemical and Radioactive Content of Oilfield Produced Water in Libya, *Libyan Agriculture Research Centre Journal International* 3 (3): 155-159.
- (16) M. Ashur, **Usama Elghawi** and Wyszynski M.L., (2013) An Integrated System of Gasoline Reformer and Three Way Converter for On-Board Hydrogen Production. *Solar Energy and Sustainable Development* vol. 2(1), pp. 39-48.
- (17) **U. Elghawi**, and A. Mayouf, (2014). Carbonyl Emissions Generated by a (SI/HCCI) Engine from Winter Grade Commercial Gasoline, *Fuel*, vol. 116, pp. 109-115
- (18) **Usama Elghawi** and Wedad El-Osta, (2015). The alternative energy sources and technologies suitable for Libyan future energy demand mix, *International Journal of Energy Technology and Policy*, Vol. 11, No.1, pp. 36-52.
- (19) **Usama Elghawi** and Husam Shames, Management of Radioactive Waste in Libya: Case Study (2016) *Journal of Hazardous, Toxic, and Radioactive Waste*, ASCE, 2016, 20 (3): 04016001-7.
- (20) **Usama Elghawi**, Taha Barka, and Feisal Abutweirat, (2017). Evaluation of Naturally Occurring Radioactive Materials (NORM) in the South Eastern of Libya, *International Journal of Low Radiation*, Vol. 10, No. 4, 2017.
- (21) Wedad El-Osta and **Usama Elghawi**, (2020). Assessment of Energy Indicators in Libya: Case Study, *Sustainable Development*; Vol. 2, No.,1.
- (22) Ahmed Hasan, **Usama Elghawi**, et al. (2018). Influence of composite after-treatment catalyst on particle-bound polycyclic aromatic hydrocarbons –vapor-phase emitted from modern advanced GDI engines, *Fuel*, vol. 222, pp. 424-433.
- (23) **Usama Elghawi**, Ahmed Mayouf, and A. Tsolakis (2020). Hydrocarbon species emitted from modern advanced GDI engines using winter grade commercial gasoline, *Combustion Engines*. 2020, **180** (1), 17-24.  
<https://doi.org/10.19206/CE-2020-103>
- (24) **Usama Elghawi** and Meftah Elammari, Assessment of occupational external radiation exposure of workers in the Southwest of Libya using portable NaI detector, *Applied Radiation and Isotopes* 206 (2024) 111246.
- (25) **Usama M. Elghawi** and Hana A. Takalli, Shielding Design for DSRS Storage Drums: A Comparative Study between two Deterministic Programmes Micro-Shield and a Local Gamma-Shield, To be published in *Annals of Nuclear Energy*

## Conferences

- (1) F. A. El-Bakkoush, T. S. Akki, **U. M. El-Ghawi** and R. M. Megahid. Dose Attenuation and Build-up Factors for  $\gamma$ -rays from Cs137 and Co60 in Tissue Equivalent Materials. 3rd International Symposium on Radiation Physics. (Ferrara, Italy; Sep. 30, to Oct. 4, 1985). (Abstract book, page no. 164).
- (2) **U. M. El-Ghawi** and E. Özensoy. Modeling Extraction of Uranium with Tri-n-Octyl Phosphine Oxide in Nitrate Media. 5th Symposium on Separation Science and Technology for Energy Application. (Knoxville, Tennessee, USA; Oct. 26-29, 1987). (Abstract book, page no. 49).
- (3) S.A. El-Dabbar, **U. M. El-Ghawi** and R. M. Megahid. Effects of Albedo Neutrons on the Distribution of Thermal and Epithermal Neutrons in two Layer-Shield. 7th International Conference on Radiation Shielding. (Bourivemouth, hampshire UK; Sep. 12-16, (1988).
- (4) S. K. Biswas, I. Borbely-Kiss, **U. M. El-Ghawi**, E. Koltay and Gy. Szabo. On the Application of PIXE at  $10^5$  eV Bombarding Energies. International Conference on Application of Nuclear Techniques Pages: 179-184 (Heraklion, Crete, Greece; June 24-30, 1990). Publisher: WORLD SCIENTIFIC PUBL CO PTE LTD, SINGAPORE
- (5) **Usama. M. El-Ghawi** and B. M. Bahal. A Comparative Study for Elemental Detection using Conventional and Low Energy PIXE. First Arab Conf. for Physics. (Tripoli, Libya; Oct. 28-30, 1991). (Abstract book, page no. 5)
- (6) S. K. Al-Arbi, B. M. Bahal, **U. M. El-Ghawi**, A.A. Gulak and H. H. Enbia. Very low energy  $\beta$  measurements in tritium contaminated parts. 8th International Congress of the International-Radiation-Protection-Association – Worldwide Achievement in Public and Occupational Health Protection Against Radiation VOL I Pages: 853-856 Published: 1992 (Montreal, Canada; May 17-22, 1992). Publisher: INT RADIATION PROTECTION ASSOC, 2155 RUE GUY, BUREAU 820, MONTREAL PQ H3H 2R9, CANADA
- (7) **U.M. El-Ghawi**. Determination of Lead in Different Plants at Tripoli City by PIXE Method. 9th International Confer. on Heavy Metals in the Environment. (Toronto, Canada; Sep. 12-17, 1993).
- (8) **U.M. El-Ghawi** and Ivancica Bogdanovic. Determination of Some Toxic and Essential Elements in Soils at Tripoli City by ED-XRF Analysis Method. 3rd International Conf. on the Biogeochemistry of Trace Elements. (Paris, France; May 15-19, 1995).
- (9) **U.M. El-Ghawi**, I.O. Abugassa, Daw Mosbah and György Pátzay. The Distribution of Trace Elements in Libyan Ground Water. 7th Nuclear Analytical Methods in the Life Sciences. NAMLS-7. (Antalya, Turkey; June 16-21, 2002, Abstract book, page no. 110, EN-31).
- (10) **U.M. El-Ghawi**, I.O. Abugassa and S. M. Al-Fakhri. Analysis of Arab Ore Phosphate, for Macro, Micro and Toxic Elements using INAA. 6th Arab Conference on the Peaceful Uses of Atomic Energy. (Cairo, Egypt; December 14-18, 2002, Abstract book, page no. 129).
- (11) **U.M. El-Ghawi** et al., Multi-elemental Analysis of Libyan Soils by INAA. 3rd African Research Reactors Conference. (Rabat, Morocco; March 2003, Abstract book, page no. 8/31)
- (12) **U.M. El-Ghawi** and M.M. Ashur. Estimation of Heavy Element Pollutants from West Tripoli Electrical Power Plant. Scientific Conference on Environment at Tripoli. (Tripoli, Libya; May 5-7, 2003).

## EMPLOYMENT RECORD.

From (year) /1984 to till now

Name of the employer

Tajura Nuclear Research Center, Libyan Atomic Energy Establishment

Address, phone number and email of employer

Libyan Atomic Energy Establishment,

P.O. Box 397 Tripoli, Libya

usama.elghawi@gmail.com; uama.elghawi@aec.gov.ly

## **Type of business**

**Management and Senior Researcher**

Exact title of my post

**Scientific Advisor**

## **Description of your duties**

**1982 - 1983:** My undergraduate project in Tripoli University, was on uranium conversion entitled ' Modeling Extraction of Uranium with Tri-n-Octyl Phosphine Oxide in Nitrate Media'

**1984 - 1986:** Engineer operator in critical assembly facility in reactor building. I dealt with many Neutronic codes.

**1986 - 1990:** I joined the radiation shielding group and during that period; the Libyan ordinary, iron-serpentine concrete and heavy concrete were investigated for different nuclear properties, and many transport casks were designed for gamma and neutron sources. Effect of Albedo neutrons on the distribution of thermal and epithermal neutrons in different layer shield were investigated.

**1990 - 1992:** Neutron generator and accelerator section at the same institute, I established a low energy PIXE project in cooperation with IAEA, I awarded an IAEA fellowship for one year in Hungary. Due to many real problems in the accelerator vacuum system the project is quitted.

Many neutron cross-section measurements done using (D-T) fast neutrons reaction with different materials.

Determination of 14 MeV neutron Macroscopic removal cross-section for many local shielding materials was investigated.

The possibility of utilizing a gas proportional counter for routine beta activity contamination checkup in neutron generator laboratory was explored.

**1992 - 2004:** I joined department of neutron activation analysis, research projects are often done in cooperation with IAEA and national agencies, and are generally interdisciplinary in nature. For example, one project involves developing instrumental and radiochemical neutron activation analysis (NAA) methods using Tajura Nuclear Research Center reactor for determination of trace elements of nutritional and toxicological elements in Libyan human diets, and the level of many interested elements in Libyan environment (arable soils and imported fertilizers). I awarded two IAEA fellowships in the field of short NAA and Psedocyclic NAA.

**1997 - 1999:** My M.Sc. project in Technical University of Budapest, Hungary, was on application of different nuclear analytical techniques for monitoring of Libyan environment. Beside my study in Engineering Physics program, I extended my study to Chemical Engineering program, the main courses were chemical of fibrous materials, chemical unite process of fibrous materials and physics of fibrous materials.

**2005\10 - 2009\6:** My Ph.D. study in Birmingham University, the UK. It was on the application of thermodynamic.

- Fuel reforming, thermochemical energy recovery.- Combustion and emission control.
- On-line emission speciation (e.g., Particulate Matter, Hydrocarbons, Unregulated Emissions).
- Future fuels and their interdependency.
- Energy Efficiency

**2009 - 2020:** I'm the head of radioactive waste management division at Libyan Atomic Energy Establishment.  
- Experience in environmental and engineering research, development, and application of different radioactive waste management aspects.

**2021 – 2023: Scientific Advisor for Libyan Atomic Energy Establishment**

**2023 – Till now: Board of Directors**

- Good knowledge of IAEA safety and security standards
- Good knowledge in gamma spectroscopy, radiation detection methods and analysis.
- Experience in gamma spectroscopy in (NORM measurements, Nondestructive Assay (NDA) Techniques for Radioactive Waste Management and Safeguards by passive gamma ray technique and active gamma ray technique) and NAA (INAA and RNAA).
- Developing and establishing legislative and regulatory frameworks including export/import principles of disused sealed radioactive sources.
- Planning and developing the required capabilities i.e. human resources and the new proposed radioactive waste storage.
- Identify suitable disposal strategies for the different types of disused radioactive sources categories and illustrate a rational approach that would allow sensible decisions to be made concerning their disposal including conditioning.
- Strengthen and applying the aspects of the Transport Regulations applicable to the loading, storage, shipping, handling and unloading of radioactive material.
- Knowledge of common approaches to regulatory aspects of nuclear safety as well as international undertakings in the area of research reactors.
- Promote strategies for radioactive waste management.
- Provide technical guidance for (DSRS) disused sealed radioactive sources and (NSF) nuclear spent fuel storage.
- Experience in development of safety, performance and risk assessment studies for waste management systems.
- Experience in training services at Libyan Atomic Energy Establishment in different areas related to the safe management of radioactive waste including: planning to radioactive waste management systems, safe management of NORM, safety assessment of radioactive waste disposal facilities, regulation and legislation of radioactive and nuclear facilities.
- The application of radiochemical analysis and other techniques to problems in area of nuclear, environmental chemistry and radioactive waste management studies.

**Participating in different projects:**

- Technical Meeting to Discuss Human Intrusion and Future Human Actions in relation to Disposal of Radioactive Waste” (J9-TM-42929) Participant in working group (3) “Siting / Design Aspects”
- The Libyan counter part of IAEA interregional project INT/9/176, “strengthening cradle-to-grave control of radioactive sources”.
- A member of the standing committee for the development of the national policy and strategy for safe management of radioactive waste and disused radioactive sources.
- A member of the Libyan standing committee for design and construct the Libyan radioactive waste central facility in cooperation with GRS Germany
- A member of Libyan committee of search and secure of orphan sources.
- More than 39 years’ experience in research and management in the nuclear filed at Tajura Nuclear Research Center and LAEE.
  
- The Candidate was the Libyan counterpart of INT9176 Strengthening Cradle-to-Grave Control of Radioactive Sources in the Mediterranean Region.
- Participant in INT 9182 „Sustaining Cradle-to-Grave Control of Radioactive Sources”.
- Participated in IAEA TC project entitled "Food Analysis and Routine Monitoring of Aerosols and

Drinking Water Sources using NAA and PIXE". The IAEA project Number LIB/7/003.

- Research projects are often done in cooperation with IAEA and national agencies, and are generally interdisciplinary in nature. For example, one project involves developing instrumental and radiochemical neutron activation analysis (NAA) methods using Tajura Nuclear Research Centre reactor for determination of trace elements of nutritional and toxicological in Libyan human diets, and the level of interested elements in Libyan arable soils and imported fertilizers.

- "Technical Meeting to Discuss Human Intrusion and Future Human Actions in relation to Disposal of Radioactive Waste"(J9-TM-42929) Participant in working group (3) "Siting / Design Aspects"

- Derivation of Specific Clearance Levels For Materials That Are Suitable For Disposal in Landfills, Vienna, Austria, 27-29 November 2017, J9-TM-1702659.- Participated in Technical Meeting on **Forum on Safety of Near Surface Disposal**, Group one "Use of the Safety Case in Decision Making", Vienna, 7 to 11 October 2019

- Now the Libyan counterpart of INT9187 "Sustaining Cradle-to-Grave Control of Radioactive Sources — Phase III".