

2019 - Sustainable Industrial Processing Summit & Exhibition

2019 SIPS



**PARAMESWARAN
INTERNATIONAL
SYMPOSIUM**

23-27 Oct. 2019, Coral Beach Resort, Paphos, Cyprus

Dr. Krishna Parameswaran Biography

Member The Minerals, Metals & Materials Society (TMS), Society of Mining Engineers (SME), American Society for Metals (ASM) International- The Materials Information Society, Environmental Professionals of Arizona and the Global Reporting Initiative (GRI) Community.

Previously represented ASARCO LLC on the Executive Committee and Board of Directors of the Arizona Mining Association, *National Mining Association (NMA), Lead Industries Association, International Copper Association, International Lead Zinc Research Association and International Copper Research Association.*

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Biography

Krishna Parameswaran, 72, received a Bachelor of Technology degree in metallurgical engineering from the Indian Institute of Technology, Mumbai, India in 1968; a Master of Science degree in metallurgical engineering from the University of Missouri-Rolla in 1971 and a Doctor of Philosophy in metallurgy from Pennsylvania State University in 1974. He has been a licensed professional engineer in Pennsylvania since 1989.

He is currently President of tfgMM Strategic Consulting located in Scottsdale, Arizona, U.S.A. a consulting firm focusing on environmental compliance, permitting and sustainable development in the extractive industries, especially metal mining and metal recycling industries. Krishna retired from ASARCO LLC (Asarco) after 34 years of service on March 31, 2015. He joined Asarco, an integrated primary U.S. copper producer, as a Senior Research Engineer in 1981 at Asarco's Central Research Laboratories in South Plainfield, New Jersey. His most recent position was Director of Environmental Services and Compliance Assurance in Asarco's Environmental Affairs Department in Tucson, Arizona. His responsibilities included oversight of environmental permitting and compliance activities at Asarco's operating facilities; coordination of environmental activities among the facilities; providing technical support to environmental programs within the operations; developing environmental policy, goals and objectives for the company and operations and ensuring internal consistency within Asarco on environmental issues. In addition, he coordinated the company's Sustainable Development activities and managed its Environmental Management System (EMS) and compliance auditing programs. He has edited, authored/coauthored chapters in books dealing with sustainability development considerations in mining, innovative mineral and

metallurgical process development and marketing and has published a number of papers on sustainability, water and energy use and conservation, resource conservation, reclamation in the arid areas of the southwestern United States and innovative post-mining land uses and the utilization of copper slags and tailings to produce geopolymers as an effective cement substitute. He has made numerous presentations to university students and professional societies on sustainability considerations in mining, innovative reclamation techniques in arid areas, water management in the mining industry and siting of renewable energy projects on disturbed mine lands.

Prior to joining Asarco, he was a member of professional staff in the Chemical and Metallurgical Engineering Section of Arthur D. Little, Inc., engineering and management consultancy located in Cambridge Massachusetts, USA. He contributed importantly to ferrous and non-ferrous metallurgy projects involving process and technology evaluation, process development, energy use and conservation, scrap recycling, solid waste utilization, mathematical modeling, environmental impact analysis and policy analysis.

Parameswaran has been interested in sustainable development for well over two decades. As Director of Environmental Services and Compliance Assurance at Asarco he advocated for the incorporation of sustainable mining practices throughout the entire production life cycle in the company's operation. He led the company's efforts to push for sustainability in the area of reclamation and innovative land use that led to the siting of a 57 MW photovoltaic solar generating facility on retired agricultural land that had been acquired for water rights purposes.

At Asarco he was also a strong proponent of collaboration with stakeholders on sustainability initiatives. For example, he led the development of research partnership with various departments of the University of Arizona and the Pima County Regional Wastewater Reclamation Department. Examples of projects include:

- Utilization of Class A and Class B biosolids in the reclamation of copper mine tailings.
- Evaluation of the efficacy of dust suppressants for copper mine tailings
- Treatment of large volume mining/smelting wastes to produce geopolymer as a substitute for ordinary Portland cement.

Parameswaran has also made important contributions in the area of mineral policy and the mining industries relations with governments and communities. He served on the Board of Directors, the Executive Committee and various environmental committees of the Arizona Mining Association. In September 2018, he was re-appointed by the U.S. Secretary of the Interior to the Arizona Bureau of Land Management (BLM) Resource Advisory Council (RAC) for a second three-year term representing mineral and energy interests. The RAC provides advice to the state BLM Director on public land issues. He has previously served on several federal and state advisory bodies, including the U.S. Department of Energy Mining Industry of the Future Program, Sustainable Minerals Roundtable co-chaired by the U.S. Forest Service and the U.S. Geological Survey and as an Advisory Committee member for the Arizona Department of Environmental Quality Voluntary Environmental Stewardship Program.

In his current role as President of tfgMM Strategic Consulting he continues to be active in studying the role of sustainable development in the minerals industry. He maintains engagement with professional societies such as The Minerals, Metals & Materials Society (TMS), Society of Mining Engineers SME and the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) and offers guidance and mentoring to students in mining, metallurgy and environmental engineering,