the KAPPE LECTURE Series

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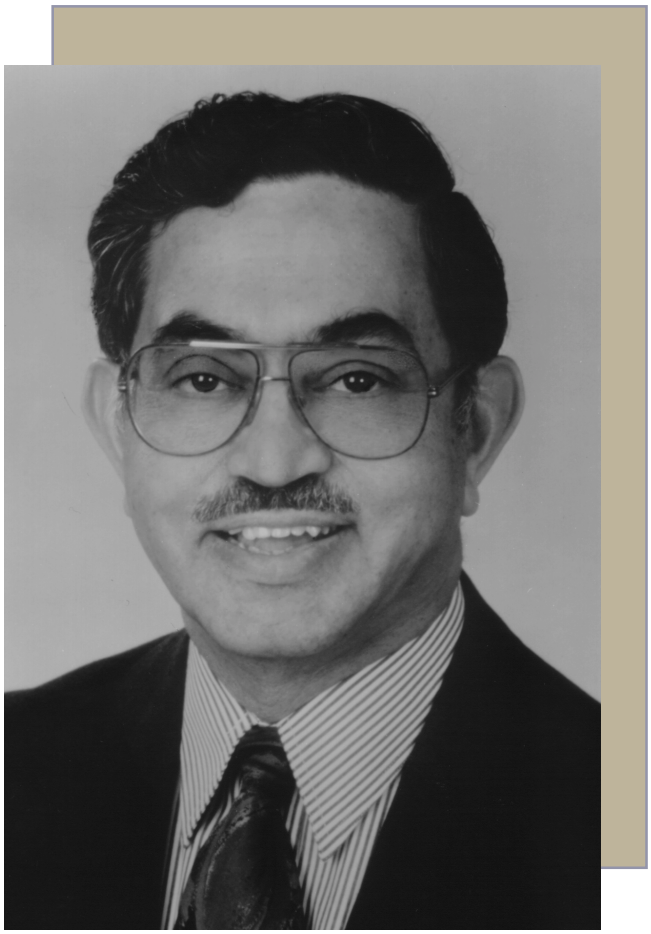
2005

AMERICAN ACADEMY OF ENVIRONMENTAL ENGINEERS®

THE 2005 KAPPE LECTURER



N.C. VASUKI., P.E., DEE

Chief Executive Officer, Delaware Solid Waste Authority

EDUCATION

University of Mysore	1959	BCE
University of Delaware	1963	MCE

PROFESSIONAL CREDENTIALS

Registered Professional Engineer in Delaware
Diplomate, American Academy of Environmental Engineers

PROFESSIONAL HONORS

Robert L. Lawrence Distinguished Service Award, SWANA
Government Engineer of the Year Award, Delaware Engineering Society
Roy F. Weston Award, Journal of Solid Waste Technology & Management
Honorary Fellowship, Chartered Institute of Waste Management – United Kingdom
Edward J. Cleary Award, AAEE
Professional Achievement Award Regular Member, SWANA
Distinguished Alumnus Award, College of Engineering, University of Delaware
"Clean Air" Award, Delaware Lung Association

A well-recognized figure in Solid Waste Management, N.C. Vasuki's exposure to environmental engineering came by way of his grandfather, who was a well-known civil engineer and a specialist in sanitary engineering. In 1948, his grandfather, along with four other engineers started the National Institute of Engineering (NIE) as an affiliate of the University of Mysore (India).

N.C. had early aspirations of a career in marine engineering and was selected by the only school in India that offered such training, but it was his grandfather who convinced N.C. to enter N.I.E. to pursue a career in civil engineering. Upon graduation, N.C. joined the hydraulic research institute headquartered at the K.R. Sagar Dam near Mysore City. He applied to various schools for graduate studies, including the University of Delaware.

In 1960, N.C. entered the University of Delaware with intentions to specialize in prestressed concrete structure engineering, but was encouraged by the Chair of the Civil Engineering Department to pursue environmental engineering. N.C. received his Master of Civil Engineering in 1963.

From 1962 to 1973, N.C. assumed roles ranging from Research Engineering through Manager while working in the water and air quality programs for the State of Delaware. In 1973, he became the Director of Division of Environmental Control for the State of Delaware's Department of Natural Resources and Environmental Control.

In October of 1976, he became General Manager of the newly-formed Delaware Solid Waste Authority. Today, he serves as Chief Executive Officer of this independent body which has full control of solid waste management in the State of Delaware including licensing solid waste collection and disposal.

His professional memberships include: Solid Waste Association of North America, National Society of Professional Engineers, Water Environment Federation, Society of American Military Engineers, Delaware Academy of Science, New York Academy of Science, Sigma Xi — The Scientific Research Society, Rotary Club, and the International Solid Waste Association, of which he currently serves as President.

ABSTRACTS OF LECTURES OFFERED

Solid Waste Processing and Disposal – Another Frontier in Environmental Management

Human beings are the only species that want more than their bare minimum needs. They are also the only species that tinker with natural systems to produce what they want and not always wisely. One consequence is the daily discard of solid wastes. Managing the inexorable solid waste discard stream is a ubiquitous problem. All societies struggle with this issue. The universal solution offered to resolve the problem is Recycling.

Emission of Green House Gases (GHG), dwindling non-renewable resources, loss of wetlands from filling, pollution of ground and surface waters by leachates from waste dumps, and spread of diseases through vermin are some of the major global environmental problems we have to tackle. In resolution of those local and global problems solid waste management issues are intricately inter woven. Wealthy societies pay attention to the consequences of improper management. Poorer societies postpone the action to correct problems until their income levels increase.

Today Global environmental quality cannot be improved only by controlling environmental releases in the wealthy countries. It requires as a minimum, action in two of the most populous nations in the World, China and India, because they collectively dispose more solid wastes each day than USA and Western Europe.

Collection, processing and disposal of solid wastes is a civic challenge and programs to minimize the impact of solid wastes disposal is truly a Global Environmental issue. Historically, urban solid wastes have been collected and transported to dumping areas outside the urban centers. Even now, this is practiced in USA and Canada; however, the solid waste is disposed in well-engineered modern landfills.

In the 1960's, the US Public Health service took steps to minimize the environmental and public health impact of solid wastes disposal. More federal and State environmental protection laws enacted in the 1970 - 1980 period resulted in enormous quantities of various residues.

The effort to efficiently collect, store, transfer, process and dispose solid wastes discarded in any society requires team work of all engineering and scientific disciplines. In addition, a flexible management system is essential for minimizing societal costs. Flexibility is also necessary because of the ever-changing composition of packaging materials used to sell consumer products.

Since wealthy societies do demand and consume a disproportionate amount of the World's natural resources, a good integrated solid waste management program can be considered as an ethical requirement. Wealthy societies must also strive for optimum use of materials (reuse & recycling) to reduce Global imbalances.

This lecture will illustrate the complexity of solid wastes management in the context of engineering and science applications. It will include discussion of recycling and reuse issues, economics of systems, energy recovery and ultimately the ubiquitous landfills that are the foundation of a stable management system.

Since USA and Canada are overly dependent on landfills for solid waste disposal, the long-term implications of landfill design and operations will also be presented. This lecture will also mention Research and Development needs in solid waste management and career development potential.

Engineering Aspects of Solid Waste Management

Americans collectively discard over 450,000 tons of solid wastes every day. Efficient collection, storage, transfer, processing and disposal of the enormous quantity of solid wastes is truly an engineering challenge. Improper management severely impacts local and global economy, environmental quality and public health. This is especially evident in emerging economies such as China and India.

The universal solution offered for solid wastes management is recycling of select materials. Recycling systems are complex and do not always result in environmental quality improvement. While select materials can be separated from the discard stream, the sustainability of recycling materials is very much market dependent. Adding to the complexity is the ever-changing mix of packaging materials. New, more efficient, attractive, and cost efficient packaging material may not be easily recyclable

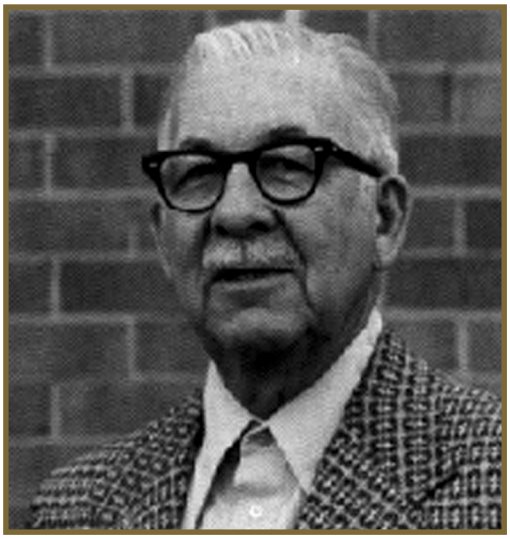
Well-engineered modern sanitary landfills (WEMSL) are the mainstay for solid wastes disposal in USA, Canada, Australia and New Zealand. In Japan and select countries of Western Europe, the plants that use of non-recyclable but combustible solid wastes for energy recovery (WTE) are widely in use. While both WEMSLs and WTE plants offer certain rewards and commensurate risks, the choice of technology is a matter of societal choice and willingness to pay for services.

There are a number of conversion technologies currently available for our use. Incineration with and without energy recovery, methanization of organic wastes, mechanical biological treatment, and composting are examples of conversion technologies. However, WEMSLs are required for disposal of residues generated by all conversion technologies.

WEMSLs are marvelous engineered systems capable of serving the widely varying discards of our affluent society. No other system offers such elasticity. This lecture will offer a pragmatic view of landfill design, operation, closure and post closure maintenance. Systems for leachate and landfill gas collection will be described along with treatment options.

USA and Canada rely mostly on WEMSLs because they offer the lowest near term cost for disposal and it is estimated that in excess of 1.5 billion tons of solid wastes will be disposed during the next decade.

WEMSLs require carefully engineered closure plans and long term care and monitoring — surface water, ground water, landfill gas, settlement, cover integrity – that will require large investments. Money for these costs has to be a part of current landfill operating costs. Otherwise the cost will be borne by future generations. The lecture will also suggest research and development needs in solid waste management and the potential for career development and an increasing number of jobs over the longtime.



"A man's debt
to his profession
is to help
those that follow"

STANLEY E. KAPPE, P.E., DEE, a successful environmental engineer, believed he owed a debt to the profession that rewarded him so well. During his life, he gave of himself to his university and to his profession through countless hours of volunteer activity. And, through this Lecture Series, he continues to share his good fortune with tomorrow's environmental engineers.

He graduated from Pennylvania State University in 1930 with a bachelor's degree in sanitary engineering. He served with the ennsylvania State Health Department and the U.S. Army Corps of Engineers before joining the Chicago Pump Company as its Eastern Regional Manager in 1935. In 1945, he founded Kappe Associates, Inc., a water supply and wastewater equipment company headquartered in Rockville, Maryland, and continued as its Chief Executive Officer until his death in 1986.

His peers recognized his contributions to the profession by numerous awards, including the AWWA Fuller Award, the WPCF Arthur Sidney Bedell Award, the WPCAP Ted Moses and Ted Haseltine Awards, and the AAEE Gordon Maskew Fair Award. In 1985, Pennsylvania State University named him Outstanding Engineer Alumnus.

Stanley E. Kappe was an activist member and leader in several national and Chesapeake region professional societies. He served as the Executive Director of the American Academy of Environmental Engineers from 1971 to 1981.

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