

# Dr. Placid Rodriguez Memorial Lecture

Organised by Kalpakkam & Chennai Chapters of  
The Indian Institute of Metals



05.10.1940-31.08.2008



To perpetuate the strong scientific spirit and the value system which Dr. Placid Rodriguez practiced during his life time, “Dr. Placid Rodriguez Memorial Lecture” was instituted by The Indian Institute of Metals (IIM), in 2009, under the pioneering leadership of Dr. Baldev Raj, Director, National Institute of Advanced Studies, Bangalore. Since then, this event is being organised annually by the Kalpakkam and Chennai chapters of The IIM.

The previous Placid Rodriguez Memorial Lectures were delivered by

- ❖ Prof. Atul Chokshi, Indian Institute of Science, Bangalore (2009)
- ❖ Prof. Seeram Ramakrishna, National University of Singapore (2010)
- ❖ Dr. Srikanth, Director, NML, Jamshedpur.(2011) and
- ❖ Prof. B.S. Murty, IIT, Madras (2012)
- ❖ Prof. Indranil Manna, Director, IIT Kanpur (2013)
- ❖ Dr. Amol A. Gokhale, Director, DMRL Hyderabad (2014)
- ❖ Dr. G. K. Dey, Associate Director, Materials Group, BARC, Mumbai (2015)

Dr. Placid Rodriguez, born in Quilon, Kerala on October 5, 1940, obtained his B.Sc. from Kerala University, B.E.(Metallurgy) from the Indian Institute of Science, Bangalore, M.S. from University of Tennessee, USA, Ph.D. from IISc and MBA from IGNOU. He joined the Department of Atomic Energy in 1960 and moved to The Indira Gandhi Centre for Atomic Research, (then known as Reactor Research Centre) in 1974. He established one of the leading metallurgical research laboratory at Kalpakkam. He was Director of IGCAR, Kalpakkam from 1992 to 2000. Subsequently he served as the Chairman, Recruitment and Assessment Centre, DRDO, Delhi and Raja Ramanna Fellow and AICTE-INAE Distinguished Visiting Professor at IIT, Madras.

Dr. Placid Rodriguez had an exemplary career of four decades, leading research in metallurgy, materials development for fast reactor programme of our country, shaping up human resources in defence programme and academic institutions.

Dr. Placid Rodriguez has been a member of Editorial Board of several reputed international journals in Metallurgy and Materials Science and was the Chief Editor of Transactions of The Indian Institute of Metals. Dr. Placid Rodriguez served as the President of many leading national, professional institutes. Dr. Placid Rodriguez has been a recipient of many national and international awards. He has been a Fellow of many prestigious Academies of our country.

Dr. Placid Rodriguez passed away in Chennai on 31<sup>st</sup> August, 2008.

# **Issues and Challenges in Welding and Hardfacing of Prototype Fast Breeder Reactor Components**

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## **Abstract**

Prior to the start of construction of the 500 MWe Prototype Fast Breeder Reactor (PFBR), extensive research-backed technology development was planned and implemented for materials, welding consumables, fabrication of stringent-specification components and finalisation of quality assurance procedures of fabricated components. With close interaction amongst design, materials and non-destructive evaluation engineers, materials and welding consumable manufactures, and the fabrication industries, it has been possible to overcome the challenges during fabrication of all the structural welds and pipes. A comprehensive experience of the development of welding and hardfacing technology for PFBR is presented.

## About Dr. A.K. Bhaduri



Dr. Arun Kumar Bhaduri, a B.Tech. and Ph.D. in Metallurgical Engineering from Indian Institute of Technology, Kharagpur, joined Department of Atomic Energy in 1983, and thereafter. He joined the Metallurgy and Materials Group at Indira Gandhi Centre for Atomic Research, Kalpakkam in 1984, where he is presently Distinguished Scientist and Director, and also a Senior Professor, Homi Bhabha National Institute. He received *Research Fellowship* from Alexander von Humboldt Foundation, Germany in 1994 for a 2-year post-doctoral research at University of Stuttgart, Germany. He anchors the development of materials and their fabrication technologies for Indian programmes on sodium-cooled fast reactors, fusion reactors and advanced ultra supercritical thermal power. He specialises in the field of materials joining, and has to his credit more than 220 journal publications, 360 conference presentations and 2 international patents. He is a fellow of Indian National Academy of Engineering, Indian Institute of Metals and Fellow, Indian Institute of Welding. At the International Institute of Welding, he is a member of its Board of Directors (from 2016), Vice-Chairman of Commission-II on “Arc Welding and Filler Metals” (from 2014); Member, Editorial Board of *Welding in the World* (from 2008), and has been Member, Technical Management Board (2007-2010). He is a recipient of the *National Metallurgists’ Day Metallurgist of the Year Award* (2003), *Homi Bhabha Science & Technology Award* (2002), *Indian Nuclear Society Medal Award* (2002), *VASVIK Award* (2005), *DAE Group Achievement Awards* 9 times during 2006-2014 (including 3 times as Group Leader), *Sir L.P. Misra Memorial Lecture Award* (2010), and *IIW-India Golden Jubilee Welding Ratna Award* (2016).