

# HARDARSHAN SINGH VALIA

## 36-YEAR LIFE MEMBER



**HARDARSHAN VALIA** completed his M.Sc. Tech. in applied geology at Nagpur University, India; his M.A. in geology at Bryn Mawr College; and his Ph.D. in geology at Boston University. After teaching for a short period at Case Western Reserve University and Oberlin College, he entered the industrial world in 1979 as a research engineer at Inland Steel Co.'s research and development laboratories, East Chicago, Ind., USA. His initial work began with improving blast furnace performance/operation by finding ways to improve coke strength after reaction (CSR) with CO<sub>2</sub>, which resulted in the development of a CSR predictive model. The model is successfully used to predict CSR from coal properties and helped increase CSR that resulted in performance and operation improvements at No. 7 blast furnace. During his career, Valia worked on a wide range of projects: coke behavior in the blast furnace utilizing blast furnace tuyere sampling; modification of Chinese beehive cokes for blast furnace usability; coal selection and blend design for heat recovery/non-recovery and slot oven cokemaking; research on carbonization behavior of coal in heat recovery/non-recovery and slot oven cokemaking; use of poor-quality (low-rank) coals in cokemaking; prediction of coking quality of coal reserves; effect of oxidation on coke quality; new cokemaking technologies; coal selection and coal behavior in blast furnace pulverized coal injection; and the use of additives in cokemaking, ironmaking and steelmaking. Valia retired from ArcelorMittal as a staff scientist in 2002 and started a consulting firm, Coal Science Inc.

From my nascent days in coal petrography, I've marveled at the magical formation of colorful carbon forms during the coal-to-coke carbonization process. To an untrained eye, coal and coke are dirty-looking materials. But looking under an optical microscope, seeing how the organic entities in coal melt into nematic liquid crystals that come closer, talk to each other and coalesce into a beautiful entity called coke, one can fall in love with nature's wonder.

I consider myself blessed that Inland Steel Co. (now ArcelorMittal) provided me with the opportunity to explore this world of magic when I joined its research and development laboratories

in East Chicago, Ind., USA, in the fall of 1979 as a research engineer. I had a free hand to explore ideas that would increase productivity, enhance operation efficiency, improve quality and reduce cost, always with an eye on environmental conservation. At Inland/ArcelorMittal, both the research and cokemaking/ironmaking operations worked hand in hand every step of the way due to management's vision, leadership skills, and faith in its employees and the team members' cooperative spirit and selflessness. We celebrated our victories; we shed tears for our losses. Our greatest victory was to bring a non-polluting cokemaking technology called SunCoke Heat Recovery Cokemaking to Inland Steel in 1998.

To my knowledge, we were the first steel company in the world to have adapted heat recovery technology, paving the road so other domestic steelmakers could follow. Prior to the installation of heat recovery cokemaking, a major loss occurred when the shutting down of slot-oven coke batteries caused many employees to lose their jobs. We took comfort in likening our efforts to life's journey in which victories often outweigh defeats.

My first association with AIST goes back to my early days at Inland, where I was advised to join the Iron & Steel Society to enhance my professional growth. What a precious gift I was handed! The society offered me a world of giants



▶ American Iron & Steel Institute Award, Waldorf Astoria, New York, N.Y., 1990.



▶ Sharing the Joseph Becker Award with his family, 1999.

who were more than willing to share their wisdom, help me navigate my path and pick me up when I fell. Most of all, they were genuinely interested in the personal welfare of its members and of the industry as a whole. I am forever indebted to the Society and its members for contributing to the person I've become!

I was humbled to the core when the Iron & Steel Society awarded me with the Joseph Becker Award in 1999 for "distinguished contributions in the field of coal carbonization and coal technology," followed by the AIST 2006 Joseph Kapitan Award for Ironmaking. Another highlight of my professional career occurred when the American Iron and Steel Institute awarded my co-authors and me the Presidential Medal. Since joining AIST, I have worked to give back, participating in program committees, co-chairing cokemaking sessions and publishing my work. My association with the Association of Iron and Steel Engineers (another predecessor of AIST) began when I contributed

a chapter on cokemaking to *The Making, Shaping and Treating of Steel*<sup>®</sup>, 11th Edition, *Ironmaking Volume*.

I have received two patents, published/presented about 85 papers, contributed to five books and to the AISI website, co-authored a book entitled *Indiana Coals and The Steel Industry*, chaired 30 national and international conferences, and taught 20 courses worldwide.

Our industry is changing. However, those joining our world must remember that as long as iron is made through the blast furnace route, coal and coke will be used. I advise new graduates entering our industry to fall passionately in love with the pursuit of knowledge, but to also be at peace with yourself. Worldly storms are a part of life; both actions help navigate ill weather. Be good, give others what you have received and good things will ultimately follow your path. And most importantly, be humane. What use is achieving success if you've lost your soul along the way? ♦



▶ Childhood in India.

## VOLCANOES OF NORTHWEST INDIANA

From spoon that fetches you food  
To needle that stitches your wound  
All came from my womb  
Bloodied, exhausted  
Mother of Volcanoes  
Yes, I am the Blast Furnace of Northwest Indiana.

Oh! The sons and daughters of this land  
Can you spare some time  
Ignore Dante's Inferno  
Watch Miracle on Cline.

In the amphitheater of life  
Along the serene Michigan Lake  
Under the shadow of shifting sand dunes  
Belching hot lava of steel  
That flows, meanders through the uneven land  
Erecting houses, bridges, highways, rail tracks  
Giving shapes to cars, trains, ships, bicycles  
Running turbines, generating electricity  
Propelling windmills  
Pumping oil and gas.

Yes, I do explode  
Yes, I do spew ash  
Yes, I do emit noxious fumes  
Shed enough tears repenting over mistakes  
Took many corrective actions to improve.

I refuse to be boarded up  
I will not let grass obliterate my housing  
I have promises to keep  
To deliver nature's bounty  
To improve lives of masses  
So long I can deliver goods  
And protect them with an invisible blanket  
Woven with steel threads,  
I shall survive!

—Hardarshan Singh Valia