DR. JUAN CARLOS NAVA

EDUCATION

BS Chemical Engineering, Universidad Del Zulia, Venezuela, 12/16/1982.
Course work emphasized process design with a minor on electrochemistry for corrosion research.

MS Metallurgical Engineering, The Ohio State University, 12/13/1985.
Course work emphasized chemical metallurgy principles, and corrosion design.

PhD Metallurgical Engineering, The Ohio State University, 03/20/1987.
Dissertation**:** Electrochemical studies in V_2O_5- Na_2SO_4 and $NaVO_3$- Na_2SO_4 melts at 1200 K

WORK EXPERIENCE

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA, CA **2013 – PRESENT**
Lecturer, Chemical and Materials Engineering Department

Courses taught

CHE 1421L – Chemical and Materials Engineering Analysis
MTE 2070 – Materials Science and Engineering
MTE 3170L – Materials Science and Engineering Laboratory
MTE 4010/4010L – Corrosion and Materials Degradation
MTE 3030L – Polymer Materials Laboratory
MTE 4060L – Physical Metallurgy, Solidification and Strengthening Reactions Laboratory.

Project Support

Worked on several sponsored projects with the PI, Dr. Ravi:

- Evaluation Weld overlay claddings in high temperature concentrated sulfuric acid solutions
- Evaluation of Fe-base amorphous alloys for applications in chloride containing environments.
- Evaluation of sorbents and catalyst for distributed hydrogen generation
- Evaluation of inhibitor mechanism for chloride induced hot corrosion.
- Evaluation of reference electrodes for hot corrosion electrochemistry.

AEGIS PRIME SOLUTIONS, CHATTANOOGA, TN **2012 – 2013**
Consulting in Corrosion, Materials, and Surface Engineering

- Systematic failure analyses of structural components to determine the root-cause of corrosion and failure mechanism of metals and non-metals.
- Determined the most adequate material replacement options including but not limited to the implementation of various surface technology modification techniques such as thermal spray, weld overlays, laser claddings, plasma transfer arc claddings, brazes, polymeric coatings.
- Management of R&D efforts for life-time prediction data to solve corrosion related recurrent component failures including the use of electrochemical techniques.
- Composition of technical reports and structuring of technical training packages on the subjects of metallurgy and corrosion phenomena.

ALSTOM POWER INC, THERMAL SERVICES, WINDSOR, CT **1998 - 2012**
Applications & Technology Manager

- Managed the integration of lasers and conventional welding technologies to generate a proprietary and cost competitive cladding product line eliminating outsourcing and positioning ALSTOM as the leader in the component replacement for Super Critical Boiler designs.
- Implemented guidelines for boiler components reliability with the standardization of replacement cycles resulting in a 20% increase in margin retention.
- In collaboration with commercial product suppliers, implemented cost-effective in-process product quality control matrixes improving component reliability by 30%.
- Designed and conducted Materials/Corrosion technical training packages for sales and technical personnel improving captured sales opportunities by 50 %.

ABB-CE MATERIALS -WATER CHEMISTRY, WINDSOR, CT **1994 – 1998**
Senior Corrosion Engineer

- Elucidated the operational conditions leading to high temperature sulfidation attack in the furnace cavity of coal fired boilers for power generation.
- Optimized the commercial operation of chromizing of boiler tubing using minimum powder loads to maximize heat up and cooling rate profiles.
- Evaluated the use of the chromizing technology to manufacture chromia-magnesia high emissivity ceramic tiling.

SHELL International Petroleum Co, Arnhem, Holland **1990 – 1993**
Corrosion Engineer

- Elucidated the operational conditions leading to the sulfide induced Stress Corrosion Cracking of SS 300 series in the overhead lines of hydrotreating units.
- Elucidated the limits of operation of SS 304 under liquid metal attack by Al-silica based paints, Al foil grade 1200, ALUZINK and pure antimony (Sb).
- Study the susceptibility of corrosion resistant alloys to high temperature Oxidation-Chloridation-Carburization in the catalyst regeneration tower in platformer units.
- Study of the susceptibility of C4140 HV 350-400 steel to high temperature sulfidation by MOLYKOTE.

Max-Planck-Institute for Metal Research, Dusseldorf, Germany **1988 – 1990**
Post-Doctoral Research Fellowship

- Elucidated the mechanism of low temperature carburization, Metal Dusting.

- Study the limits of carbon content in ferritic steels affecting the stability of protective chromia layers formed on Fe-Cr model alloys during high temperature oxidation at 900^{o}C.

PROFESSIONAL DEVELOPMENT

- *Effective Teaching practices*, Association of College and University Educators (ACUE), CPP-A, Spring 2019 – Fall 2019 Cohort A
- *Promoting Active Learning Online*, ACUE, CSU,Al-N_July 2020 Cohort N.
- *Remote Course design for Fall 2020*, Faculty Affairs the CAFÉ team, June – August 2020.
- *Laboratory on line design*, College of Engineering and Science, CPP, July-August 2020.
- *Management, Effective Presentations and Lean Manufacturing*, ALSTOM University, Year?

- Languages
    - Fluent in Spanish (Mother language) and English
    - Conversational in German

HONORS AND AWARDS

- Eminent Engineer Tau Beta PI, 2015.
- Member, Alpha Sigma Mu, The International Professional Honor Society for Materials Science and Engineering, 1987.

PUBLICATIONS

1. "Electrochemical Reactions by $NaVO_3$ and Na_2CrO_4 solutes in fused Na_2SO_4", D.Z. Shi, J.C. Nava, R.A. Rapp *JOURNAL OF THE ELECTROCHEMICAL SOCIETY*, Volume 134, Issue 8B, Page C466-C466, 1987.
2. "Metal Dusting", J.C. Nava Paz and H.J. Grabke, *Oxidation of Metals*, Volume 39, pages 437 – 456, 1993.
3. "On the mechanism of catastrophic carburization: metal dusting", H.J. Grabke, R. Krajak, J.C. Nava Paz, *Corrosion Science*, Volume 35, # 5 – 8, Pages 1141-1145, 1147-1150, 1993.
4. "Fabrication of dense shaped Barium Cerate by the oxidation of solid metal-bearing precursors", Hans J. Schmutzler, Kenneth H. Sandhag, Juan C. Nava, *Journal of the American Ceramic Society,* Volume 79, # 6, Pages 1575 -1684, 1996.
5. "Waterwall corrosion mechanisms in coal combustion environments", Nava-Paz, J.C, Plumley, A.L, Chow, O.K., *MATERIALS AT HIGH TEMPERATURES*, Volume 19, # 3, Page 127-137. 2002.
6. "The kinetics of oxidation of diffusion coatings in superheated steam", Juan Carlos Nava, Stephen Goodstine & Edward Sylva, *MATERIALS AT HIGH EMPERATURES*, Volume 2, #1-2, page 87-91, 2005.
7. "Performance of Composite Coatings in a Coal-Fired Boiler Environment", Nava, Juan Carlos, *MATERIALS PERFORMANCE*, Volume 48, # 9, Page 40-45, 2009.
8. "Cost Effective Thermal Spray Coatings for the boiler industry", Nava Juan Carlos, *WELDING JOURNAL,* Volume 88, # 7, Page 38-41, 2009.
9. "Thermal spray metallic coating for offshore platform risers", Nava, Juan Carlos, *MATERIALS PERFORMANCE*, Volume 48, # 12, Page 38-41, 2009.
10. "Corrosion of High Entropy Alloys in Molten Salts", Alexander Jalbuena, Jared Logier, J. C. Nava, Shaik Adil, B.S Murty and Vilupanur Ravi, *Corrosion/2018, Paper No. C2018-11664* (Houston, TX: NACE, 2018).
11. "Electrochemical Characterization of Ni- & Fe-Based Alloys in Simulated Biomass Environments at 700°C", Obed Villalpando, Juan Carlos Nava and Vilupanur A. Ravi, *Corrosion/2016, NACE, Vancouver, Canada, Paper No. 7822 (C2016-7822).*
12. "Hot Corrosion of Nickel-Chromium Alloys in a Molten Eutectic Salt Environment", Bradley Stuart, Juan Carlos Nava, Obed Villalpando and Vilupanur A. Ravi, *Corrosion/2016, NACE, Vancouver, Canada, Paper No. 7824 (C2016-7824).*
13. "Sulfuric Acid Corrosion of Several Ni-Base Alloy Weld Overlays", Bingtao Li, George Lai, Charles Gepford, Obed Villalpando, Armen Kvryan, Juan Nava and Vilupanur Ravi, *Corrosion/2015, NACE, Dallas, TX, Paper No. 5749 (C2015-5749).*
14. "The Effect of Chromium Content on the Hot Corrosion Resistance of Nickel-Chromium Alloys in Molten Sodium Sulfate", Charles Gepford, Stephen Schoniger, Zack Gentry, Andrew Sakamoto, Karim Ali, Norton Thongchua, Juan Carlos Nava and Vilupanur Ravi, *Corrosion/2014, NACE, San Antonio, Paper No. 4432.*
15. "Aluminizing of steel to improve high temperature corrosion resistance," in Thermochemical surface engineering of steels, V. A. Ravi, T. K. Nguyen and J. C. Nava

Chapter 21, Mittemeijer and Somers (editors), Woodhead Publishing, Elsevier, Cambridge, UK, 2015 (ISBN: 978-0-85709-592-3).

PATENTS

1. Patent No.: US 7,153,802B2, *Method of making an electrode for a membrane electrode assembly and method of making the membrane electrode assembly,* Judith Manco, Christopher Capuano, Juan Nava, Flavio Tinoco, Dec. 26, 2006.

2. Patent Application No.: US 20160304993A1, *Ductile nickel based austenitic alloy coating and method of fabrication,* Vilupanur Ravi, George Lai, Juan Carlos Nava, Oct. 20, 2016.

3. Patent No.: US 9,869,629B1, *Innovative and safe method to conduct high temperature halogenation of metallic alloys* Vilupanur Ravi, Juan Carlos Nava, Shahan Kasnakjan, Jan. 16, 2018.