Name: Ramprashad Prabhakaran
Title: Materials Scientist
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Education and Training

University of Idaho, Idaho Falls, ID, M. Engr. in Nuclear Engineering (Nuclear Materials), 2014
University of Nevada, Las Vegas, NV, M.S. in Mechanical Engineering (Materials), 2004
University of Madras, India, B.E. in Mechanical Engineering, 2001

Research and Professional Experience

Materials Scientist (From Jan'16): Pacific Northwest National Laboratory, Richland, WA

- Leading the tasks related to mechanical (room and elevated temperature) and microstructural characterizations, to understand irradiation effects/hardening mechanisms on various irradiated structural materials (NSUF, FCR&D, NEET, LWRS, RaDIATE and Fusion projects).
- Leading the efforts to obtain the mechanical properties, microstructural characteristics and corrosion behavior of friction stir welded alloys (ODS, steels and aluminum) for DOE and industrial clients.
- Leading the efforts to evaluate the mechanical properties, corrosion behavior and microstructural characteristics of U-10Mo, Hf, 316SS, Zr-2 and Zr-4, Al and Mg alloys (NNSA RERTE/M^3, Tritium technology program, NSUF, VTO).

Research Associate (Sep 2014-Dec 2015): Pacific Northwest National Laboratory, Richland, WA

- Studied the mechanical properties and microstructure of U-Mo before & after processing/fabrication.
- Investigated the mechanical properties and microstructural characteristics of friction stir welded alloys.

Materials Engineer (Oct'13-June'14) - A. B. Carter, Inc., Gastonia, NC

- Involved in the research and development of steel components for high temperature and wear applications. Studied the effect of various fabrication process (wire drawing, rolling, forming) variables and evaluating material's behavior.
- Improved the material's performance by performing various heat treatments and studying its effect on the resultant metallurgical microstructure.

Research Associate (Aug'05-Sep'13): Idaho National Laboratory, Idaho Falls, ID

- Studied the microstructure and mechanical properties of nuclear fuels and structural materials before and after processing/fabrication (rolling, friction bonding, hot isostatic pressing, welding).
- Played a key role in establishing a small-scale specimen mechanical testing, and mechanical testing capability inside the INL hot-cell for studying irradiated materials.

Intern (Jan'05-Aug'05): Idaho National Laboratory, Idaho Falls, ID

- Worked on an AFCI project related to the fabrication and characterization of dispersion fuels (silicon carbide) for use in high-temperature, gas-cooled fast reactors (GFR).
- Conducted metallurgical operations, fractographic and metallographic evaluations.

Research Associate (Aug'02-July'04): University of Nevada, Las Vegas, NV

- Evaluated the microstructural characteristics, mechanical properties and susceptibility of martensitic stainless steels to SCC, hydrogen embrittlement and localized corrosion in various environments and temperatures.

Intern (Jan'01-May'01): Addison and Co. Limited (A member of the Amalgamations Group), India

- Studied the process and machine capability (6 sigma) of various centerless grinding machines.

Selected Publications

1. P. Agrawal, S. Gupta, A. Dhal, R. Prabhakaran, L. Shao, and R.S. Mishra, Irradiation response of innovatively engineered metastable TRIP high entropy alloy, *Journal of Nuclear Materials*, Volume 574, February 2023, 154217.
2. R. Prabhakaran, I. Charit, R. Mishra, K.L. Murty, A. Hoffman, D. Edwards, M. Toloczko, and S. Maloy, "Progress report: Effect of neutron irradiation on friction stir welded Ni-based ODS MA754 alloy", PNNL-33206, Pacific Northwest National Laboratory, Richland, WA, 2022.
3. R. Prabhakaran, G. Coffey, O. Marina, J. Hardy, D. Edwards, and A. Casella, "Final report: Improved understanding of Zircaloy hydrogen pickup mechanisms in BWRs", PNNL-32984, Pacific Northwest National Laboratory, Richland, WA, 2022.
4. R. Prabhakaran, C.H. Henager, and W. Setyawan, "Status of the elevated temperature mechanical test facility setup at PNNL", PNNL-SA-176100, In Fusion Materials Semiannual Progress Report for Period Ending June 30, 2022, DOE/ER-0313/72, U.S. Department of Energy, 2022.
5. R. Prabhakaran, "Mechanical properties of proton irradiated Ti grades (DS-Ti2 and US-Ti)", PNNL-SA-154380, 2020, Pacific Northwest National Laboratory, Richland, WA.
6. R. Prabhakaran, L. Gardner, D. Burkes, V. Joshi, C. Lavender, "Effect of homogenization and hot rolling on the mechanical properties, microstructure and corrosion behavior of U-10Mo monolithic fuel", *Journal of Nuclear Materials,* Vol 527, Dec 2019, 151804.
7. R. Prabhakaran, "Mechanical properties of irradiated beryllium grades (PF-60 and S-65F)", PNNL-SA-147992, 2019, Pacific Northwest National Laboratory, Richland, WA.
8. J. Wang, M. Toloczko, and R. Prabhakaran, "Ion and neutron irradiation effects studies of ferritic/martensitic steels", PNNL-29224, 2019, Pacific Northwest National Laboratory, Richland, WA.
9. D. Burkes, R. Prabhakaran, J-F. Jue, F. Rice, "Mechanical properties of DU-xMo alloys with x = 7-12 wt%", Metallurgical and Materials Transactions A, May 2009, Vol. 40A, No. 5, pp. 1069-1079.
10. R. Prabhakaran, A. Roy, "Degradations of Type 422 stainless steel in aqueous environments", Materials Science and Engineering A, April 2006, Vol. 421, No. 1-2, pp. 290-297.

Synergistic Activities

1. Actively involved with TMS committees and board in various leadership positions (Chair, Vice-Chair, Council and Board member): Nuclear Materials Committee, Corrosion and Environmental Effects Committee, Young Professionals Committee, Structural Material Division Council, Program Board Committee and Professional Development Board Committee
2. Lead symposium organizer and session chair - TMS (2012, 2013, 2014, 2015, 2016, 2017 & 2018) - Symposiums on nuclear fuels & materials
3. Key Reader/Associate Editor, JOM and Metallurgical and Materials Transactions A; E journals
4. Reviewer, Metallurgical and Materials Transactions: A; E & JOM; Scripta Materialia, Metallography, Microstructure & Analysis, Journal of Materials Engineering & Performance, Corrosion Reviews, Materials Today Communications, Journal of Nuclear Materials and Nuclear Technology journals. Reviewed over 100 manuscripts
5. Recognized by TMS professional society in a number of ways: Winner of 2017 TMS Structural Materials Division Young Professional Best Poster Award (related to FSW ODS alloys); 2015 TMS Structural Materials Division Young Leader Professional Development Award; Highlighted (one-page article) in the December 2017 issue of the JOM journal for scientific interests, achievements as a young professional and being the Guest Editor for a special topic on U-Mo metallic monolithic fuel.