YONG-YI WANG, Ph.D.

President and CTO

Overview

Dr. Wang founded the Center for Reliable Energy Systems (CRES). He is a leading expert on the structural integrity of energy pipelines and piping systems, particularly welds and joints. He is recognized worldwide for his leadership in the development and implementation of fitness-for-service (FFS) assessment procedures and strain-based design and assessment (SBDA) technology. His work spans from fundamental research to code adoption of emerging technologies. He has worked extensively with pipeline operators, industry consortia such as PRCI and INGAA, standards committees, and regulators in the design, construction, inspection, and integrity management of pipelines.

Dr. Wang has authored over 180 technical papers on pipeline integrity assessment, management of geohazards, fitness-for-service (FFS) assessment of anomalies, materials, welding, and fracture mechanics. He was the principal editor of three PVP volumes on fracture, fatigue, residual stress, and structural integrity of piping systems.

Leadership and Participation of Standards Committees and Conferences

- Chair, Fracture Mechanics Subcommittee, API Standard 1104 Welding of Pipelines and Related Facilities
- Track Chair, Geohazards Management and Strain-Based Design and Assessment track, International Pipeline Conference (IPC) by ASME
- Chair, Work Group on Circumferential Cracks, API RP 1176 Management of Cracks
- Lead contributor, API RP 1187 Pipeline Integrity Management of Landslide Hazards
- Member, Joint Task Group of API 1104 and API 5L
- Member, Task Group on Welding of Hydrogen Fuel Gas Pipelines, API 1104
- Contributor, API 579 / ASME FFS-1
- Past participant, ASME B31.8 (natural gas transmission) and B31.12 (hydrogen piping and pipelines)
- Contributing member, Canadian Standard CSA Z662 (pipeline design and construction)

Education

- Ph.D., MIT, Cambridge, Massachusetts, USA
  Major: Mechanics and Materials; Minor: Business Administration
- M.S., MIT, Cambridge, Massachusetts, USA
  Major: Computational Mechanics
- B.S., East China University of Science and Technology, Shanghai, China

Major: Mechanical Engineering

Awards

- *Honoree of the Distinguished Lecture Series*, "to recognize the technical contributions of individuals that have stood the test of time," International Pipeline Conference, Calgary, Canada, 2018. "The goal of the Distinguished Lecture Series is to present technical content that was produced over the past several decades that have provided a foundation for modern pipeline technology," as noted by the award committee comprised of Canadian Energy Pipeline Association (CEPA) and ASME's Pipeline Systems Division.
- *Distinguished Researcher Award "*for dedicated and distinguished service and scientific achievements that have enhanced the integrity, reliability and environmental performance of energy pipelines around the world," PRCI, 2018.
- *Resolution of Appreciation* for "his leadership and technical expertise in advancing research and knowledge in welding of steel pipelines," The API/AGA Joint Committee on Oil and Gas Pipeline Field Welding Practices, 2023.
- *Session Organizer of the Year* for developing the first ISOPE Symposium on Strain-Based Design of Pipelines, 2007.
- *2nd Place in the Best Paper Competition*, International Pipeline Conference, Liu, B., Wang, Y.-Y., and Chen X., "Application of Strain based Assessment in Support of Operational and Mitigation Decisions," IPC2022-87337, September 26 – 30, 2022, Calgary, Alberta, Canada.
- *Best paper*, the International Pipeline Conference, Cheng, W., Wang, Y.-Y., W. Amend, and Swatzel, J., "Weld Microstructure and Hardness Prediction for In-Service Hot Tap Welds," Calgary, Alberta, Canada, October 4-8, 2004.

Work Experience

06/2007 − Present, President and CTO, Center for Reliable Energy Systems (CRES), Dublin, Ohio
10/1998 − 05/2007, Vice President, Engineering Mechanics Corporation of Columbus, Columbus, Ohio
08-1991 − 09/1998, Senior Research Engineer, Edison Welding Institute, Columbus, Ohio

Major Accomplishments

1. Dr. Wang has been leading the investigation of girth weld failure incidents of newly constructed pipelines and the development of mitigation options. His work has generated significant positive impact on the industry practice and standards in the areas of linepipe specifications, welding process selection and welding procedure qualification requirements, field girth welding, and weld repair procedures.
2. Dr. Wang has led the industry in the application of strain-based design and assessment in the management of ground movement hazards.
    a. Lead author of an INGAA sponsored JIP report, "Framework for Geohazard Management," March 27, 2023.
    b. One of the lead authors of an INGAA sponsored JIP report, "Recommended Practice for Pipeline Integrity Management of Landslide Hazards," April 2023. This report has been the base document for the current drafting of API RP 1187 Pipeline Integrity Management of Landslide Hazards.

c. One of the lead authors an INGAA white paper on Guidelines for Management of Landslide Hazards for Pipelines published in August 2020.
d. Principal Investigator (PI) of a JIP on the Management of Ground Movement Hazards for Pipelines, completed in 2017. This JIP provides a comprehensive integrated geohazards management framework involving both geotechnical and pipeline structural integrity approaches.
e. Lead technical organizer of an ASME Symposium, Pipeline Integrity under Geohazard Conditions, 2019.
f. PI of many PRCI projects on the strain capacity of pipelines of various vintages, post-geohazard-event response plans, and mitigation options for the enhancement of pipeline strain capacity.
g. PI of many projects with pipeline operators for the development of screening criteria for mitigating geohazards, case-specific assessment of pipeline integrity after geohazard events to determine the need and timing of mitigation, development strain limit criteria for strain monitoring, etc.
h. Reviewer of PHMSA's Special Permit Conditions for Strain-Based Design.
i. Lead author of a PRCI technical bulletin on the Mitigation of Low-Strain Failures of Girth Welds in Newly Constructed Pipelines.

3. Dr. Wang was the principal investigator on the development of strain-based design and assessment models for DOT/PHMSA and industry partners for both new pipeline construction and integrity management of in-service pipelines.
4. Dr. Wang was the lead architect and developer of the Annex A alternative girth weld defect acceptance criteria of API Standard 1104.
5. Dr. Wang served as the lead organizer and chair of the first dedicated symposia on the strain-based design of pipelines under the auspices of ISOPE (International Society of Offshore and Polar Engineers).