



The 16th International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering (QR2MSE2026)

July 22-25, 2026, Qingdao, Shandong, China

Special Session #1 on:

Korean Research Activities in Physics-Based Reliability and Safety Assessment (Presentation Only) **[Session Chair: Prof. Nam-Su Huh]**

Recent advances in computational analysis and physics-based modeling have played an important role in improving the reliability and safety of engineering systems. In South Korea, extensive research activities have been carried out to understand thermo-fluid behavior, evaluate structural integrity, and assess the safety of critical industrial systems. These approaches provide essential tools for predicting failure mechanisms, improving system performance, and supporting safety-informed decision-making in various engineering fields.

This special session will present recent Korean research findings in physics-based reliability and safety assessment. The session covers a wide range of topics, including numerical investigation of smoke control characteristics under emergency ventilation conditions in railway platform fires, thermo-fluid prediction methodologies for improving the thermal reliability of cooling passages in AFPM motors, plastic collapse analysis of flawed pipe-to-elbow welds, and probabilistic assessment of nuclear piping rupture frequency considering in-service inspection intervals and probability of detection characteristics.

Through these presentations, the session aims to provide valuable insights into current Korean research activities related to fire safety, thermal reliability, structural integrity, and safety evaluation. This session is expected to promote knowledge exchange and technical collaboration among researchers and practitioners working in reliability, safety, and maintenance engineering.



Prof. Nam-Su Huh

Seoul National University of Science and Technology, Seoul, Korea

nam-su.huh@seoultech.ac.kr



Dr. Sungjin Yang

Korea Electronics Technology Institute, Bucheon, Korea

sjyang@keti.re.kr



Dr. Jongrak Choi

Korea Electronics Technology Institute, Bucheon, Korea

jchoi@keti.re.kr



Presentations:

#1. Sungjin Yang, Yongwoo Shin, Seungmin Guk and Jongrak Choi*

(Korea Electronics Technology Institute),

Numerical Investigation of Smoke Control Characteristics under Emergency Ventilation Conditions in Railway Platform Fires.

#2. Jongrak Choi, Yongwoo Shin, Heemoon Kang and Sungjin Yang*

(Korea Electronics Technology Institute),

Development of Thermo-Fluid Prediction Methodologies for Improving Thermal Reliability of Cooling Passages in AFPM Motors.

#3. Seong-Su Kim and Nam-Su Huh*

(Seoul National University of Science and Technology),

Plastic Collapse Analysis of Flawed Pipe-to-Elbow Welds under Combined Internal Pressure and in-Plane Bending.

#4. Seok-Jun Yoon, Jong-Sung Kim and Nam-Su Huh*

(Seoul National University of Science and Technology),

Impact Assessment of ISI Interval and POD Characteristics on Nuclear Piping Rupture Frequency.