2026 10th International Conference on RELIABILITY ENGINEERING

Hangzhou, China July 19-21, 2026

ICRE RELIABILITY ENGINEERING

Special Session 16

Passive safety system and digital control system relaibity for nuclear power plant

Goal

Passive safety system and digital control system are widely used in new generation reactor design to enhance the nuclear power plant safety, and the new methods are needed to satisfy the request of reliability evaluation of such systems.

For passive safety system, which operates based on natural circulation, the uncertainties of input paramters and Thermal-Hydraulic (T-H) models can influence the output of the model, then the physical process failure is one of the important contributors to system failure, needing to be considered in the system reliability evaluation and PSA model， the subject includes :new method for physical process failure probability evaluation, for passive safety system reliability evalustion, for intregrate physical process failure into PSA model, and so on.

The methods for system reliability/ usability/creditability evaluation, equipment life estimation and operating optimization are developed for digital control system and key equipment, such as control cabinet, control circuit, protection channel, special sub-system, instrument on spot, instrument board card, software and so on, the subject includes : FMEA based on knowledge base/large model, dynamic reliability, accelerated degradation and life test, degradation/ failure physics analysis and simulation, stress-life/life prabilistic distribution model, life estimation based on data driven and machine learning, optimization for test and update period, control system software reliability evaluation, intelligent control system creditability evaluation, and so on.

Topics

Topics of interest include, but are not limited to:

- Physical process failure assessment method
- Passive system reliability assessment method
- Integrate physical process failure into probabilistic safety assessment models
- Knowledge base/large model based FMEA
- Dynamic reliability modeling
- Accelerated degradation/life test
- Degradation/failure physics analysis and simulation
- Stress-life/life probability distribution modeling
- Data-driven/machine learning based life prediction
- Periodic inspection and replacement cycle optimization
- Control system software reliability evaluation
- Intelligent control system credibility evaluation
- .....

Chairs

Yu Yu, North China Electric Power University, China

Shiliang Zhou, North China Electric Power University, China

Publication

The accepted papers passed through the peer-reviewed process after proper registration and presentation will be included in ICRE 2026 Conference Proceedings, which will be archived in IEEE Xplore , and indexed by EI Compendex, Scopus, and other indexing services.

Submission

1. Full paper (presentation and publication)
- The paper must be written in English.
- All submissions will undergo a peer-review process by the conference committee.
- The paper should be at least FIVE pages including all figures, tables, and references.
- The paper should be submitted as a PDF document in .pdf format.
- submitted paper must be unpublished.
- Accepted papers will be invited for oral presentation or poster presentation and will be included in the conference proceedings.

2. Abstract (presentation only)
- Abstracts will be considered for presentation (oral/poster) only without publication.
- The abstract must be written in English.
- Abstracts should be no more than 300 words and clearly outline the title, purpose, methods, and outcomes of the research or practice being described.
- All submissions will undergo a peer-review process by the conference committee.

* Welcome to submit the paper or abstract by Electronic submission system: https://www.zmeeting.org/submission/icre2026
More details about submission, please visit at: https://www.icre.org/sub.html

Conference Program

July 19, 2026 I CONFERENCE
July 20, 2026 I CONFERENCE + COURSE + TRACKS
July 21, 2026 I TECHNICAL EXCELLENCE & TRIBUTE
July 12-25, 2026 I Young Scholar Symposium + 2026 Beihang International Summer School

Conference Venue

Conference Venue:
Hangzhou International Innovation Institute of Beihang University
Address:
No. 166, Shuanghongqiao Street, Pingyao Town, Yuhang District, Hangzhou City

Hangzhou, China

Hangzhou, a renowned Jiangnan city blending millennia of heritage and poetic scenery, boasts three world cultural heritage sites. west Lake ripples with romance; Liangzhu Ruins hold ancient wisdom; the Grand canal carries folk vibes. Timeless song Dynasty elegance meets trendy fun, and delicious local cuisine delights the taste buds. A perfect mix of classic and modern, it awaits visitors from all over the world.

Important Dates

Submission Deadline: May 15, 2026
Notification Deadline: June 10, 2026
Camera-ready Date: June 25, 2026

Sponsors LASAR³ Co-sponsors

Technical Suppot IEEE Reliability Society 75th anniversary

杭州市北京航空航天大学国际创新研究院（北京航空航天大学国际创新学院） HANGZHOU INTERNATIONAL INNOVATION INSTITUTE OF BEIHANG UNIVERSITY

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

Contact conference secretary: Ms. Lesley
Email: icre_conf@outlook.com
web: http://www.icre.org

2026 10th International Conference on RELIABILITY ENGINEERING

Hangzhou, China July 19-21, 2026

ICRE RELIABILITY ENGINEERING

特别专题 16

核电厂非能动系统与数字化仪控可靠性

专题目标 »»»

为提高核电站安全性，非能动安全系统和数字化仪控系统已在新一代核电站设计中得到广泛应用，对非能动安全系统和数字化仪控系统可靠性评估也提出了新的挑战。针对依靠自然循环运行的非能动安全系统，输入参数及热工模型本身的不确定性，都将对模拟计算结果产生影响，进而影响系统可靠性评估，物理过程失效成为系统失效的重要贡献因素之一，需要在系统可靠性评估及概率安全评价模型中予以考虑。针对数字化仪控系统及其关键设备，如控制机柜、控制回路、保护通道、专用子系统、现场仪表、板卡、软件等，开展系统可靠性\可用性\可信性评估、设备寿命预测与运维优化。

专题主题 »»»

征稿主题包括但不限于：

- 物理过程失效评估方法
- 非能动系统可靠性评估方法
- 将物理过程失效融入概率安全评价模型
- 基于知识库\大模型的FMEA
- 动态可靠性建模
- 加速退化\寿命试验
- 退化\失效物理分析与仿真
- 应力-寿命\寿命概率分布建模
- 基于数据驱动\机器学习的寿命预测
- 定检\更换周期优化
- 控制系统软件可靠性评估
- 智能控制系统可信性评估等
- ...

专题主席 »»»

玉宇，华北电力大学，中国

周世梁，华北电力大学，中国

会议出版 »»»

录用文章将被收录至ICRE 2026会议论文集，由IEEE出版，并被EI Compendex 和 Scopus 检索。

投稿方式 »»»

1). 上传文章到电子投稿系统: https://www.zmeeting.org/submission/icre2026
2). 或发送文章至会议邮箱: icre_conf@outlook.com
提示:
1. 全文投稿（含报告与出版）
- 稿件须以英文撰写。
- 所有投稿均由会议委员会进行同行评审。
- 稿件篇幅不少于 5 页，包含所有图表及参考文献。
- 稿件须以 PDF 格式提交。
- 投稿稿件须为未发表的原创成果。
- 录用稿件将受邀进行口头报告或海报展示，并收录至会议论文集。
2. 摘要投稿（仅作报告）
- 摘要仅用于申请报告资格（口头报告 / 海报展示），不纳入出版范围。
- 摘要须以英文撰写。
- 摘要字数不超过 300 词，须清晰阐明所涉研究或实践的标题、研究目的、研究方法及研究成果。
- 所有投稿均由会议委员会进行同行评审。
• 详细信息请见----https://icre.org/sub.html

会议日程 »»»

2026年7月19日- 签到注册
2026年7月20日- 开幕式+主旨报告+作者报告
2026年7月21日- 开幕式+主旨报告+作者报告
2026年7月12-25日- 青年学者论坛 + 2026北航国际暑期学校

会议地址 »»»

杭州市北京航空航天大学国际创新研究院（北京航空航天大学国际创新学院）

地址：杭州市余杭区瓶窑镇双红桥街166号

中国杭州

杭州，一座融千年文脉与诗画风光的江南名城，三大世界文化遗产勾勒其独特魅力。西湖碧波漾诗意，良渚遗址藏远古智慧，大运河流淌南北烟火。宋韵风雅浸润红墙古社，新潮玩法解锁别样体验，鲜醇杭帮菜抚慰味蕾。古典与现代交织，漫步街巷皆是惊喜，正静待八方游客前来探寻。

重要日期 »»»

投稿截止日期：2026年5月15日
审稿通知日期：2026年6月10日
注册截止日期：2026年6月25日

Sponsors LASAR³ Co-sponsors 杭州市北京航空航天大学国际创新研究院（北京航空航天大学国际创新学院） 哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

技术支持 IEEE Reliability Society 75th anniversary

Contact conference secretary: Ms. Lesley
Email: icre_conf@outlook.com
web: http://www.icre.org