

## Special Issue

# Risk Assessment and Reliability-Centered Optimization for Asset Management and Maintenance Strategies in Renewable-Penetrated Power Systems

### Message from the Guest Editors

As global power systems rapidly integrate renewable energy as a primary source, the grid is experiencing fundamental shifts in its operational landscape. The intermittency, volatility, and uncertainty of renewable generation, together with the increasing reliance on power electronics and advanced control devices, introduce new challenges for asset management and maintenance strategies. Traditional maintenance practices are no longer sufficient; instead, utilities require risk-informed and reliability-centered frameworks that ensure both resilience and cost-effectiveness. The "dual challenge" of renewable penetration and aging infrastructure has significantly altered equipment performance profiles and failure risks. It is now critical to develop quantitative risk assessment models, optimize maintenance scheduling under uncertainty, and establish adaptive strategies that balance reliability, economics, and sustainability. Moreover, digital technologies—such as data analytics, stochastic optimization, and reinforcement learning—play a pivotal role in enabling predictive, intelligent, and resource-constrained decision-making in asset management.

### Guest Editors

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### Deadline for manuscript submissions

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## Electronics

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