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(57) Abstract :
An event-driven key management system (102) designed for smart grid cybersecurity. The system (102) is focused on real-time event monitoring, the system dynamically generates unique cryptographic profiles customized to individual grid assets. Additionally, the system (102) assesses the impact of anomalies, changes in grid topology, and security incidents, promptly initiating pre-emptive key management actions. Machine learning is integrated for predictive analysis, enhancing risk identification and mitigation. Operating in a decentralized manner, the system (102) distributes key management responsibilities, ensuring fault tolerance and scalability. Adaptability of the system (102) to dynamic smart grid environment and proactive security measures contribute to robust infrastructure. Scalable and compliant with regulations, this system (102) addresses the evolving needs of smart grid deployments, aligning with Sustainable Development Goal 9 for industry, innovation, and infrastructure, and indirectly supporting Goal 7 for affordable and clean energy.

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