

H9000 COMPUTER MONITORING SYSTEM (V1.0-V6.0)



产品类成果

H9000 计算机监控系统(V1.0-V6.0)

【创新性】

H9000 计算机监控系统是具有完全自主知识产权的面向水利水电及新能源行业的自动监视与控制系列产品，为工程的安全高效、可靠稳定运行及管理提供成套智能化解决方案。该系列产品自主创新了分布开放、无主冗余的系统模型，实现了实时快速响应、软硬件兼容、跨平台应用、全分布、高冗余的系统构架。1996 年成功应用于国内首座关门运行电站。1997 年在国内首创大型梯级水电站的计算机远程集控系统。海量实时数据高速采集、处理和通信的独创技术解决了巨型电站系统性能与可靠性难题。可视化的人机交互通用模型与完备的开发维护工具极大提升了自动化系统建设与维护效率。面向对象的一体化平台，重点解决多专业应用的互联、互通、互动和异构数据融合难题，致力于水利水电及新能源领域的智能化应用和智慧化发展。

主要完成人：王德宽、王桂平、张毅、文正国、李建辉

获奖单位：中水科技

【影响力】

H9000 系列计算机监控系统诞生于上世纪 90 年代，历经 25 年开拓创新和升级打磨，已成为我国水电事业“大国重器”的中枢神经。从国内首座关门运行电站、首个大型梯级电站远程集控，到首个智慧化监管平台，从“无人值班，少人值守”到现在的智能化时代，始终站在时代的前沿，引领着技术的进步。不仅实现了水利水电监控系统的全面国产化，还成功推向了国际水电市场。H9000 系统成功应用于三峡、溪洛渡、向家坝、委内瑞拉古里等国内外水利水电工程 400 余套，其中包括 4 座世界水电 TOP10 电站。目前最大的区域水电集控中心的 H9000 调控一体化系统整体达到国际领先水平。众多新技术和新产品，形成了行业智能化、智慧化成套解决方案，并推广应用于新能源行业，为水风光多能互补提供了有力的技术支撑。产品行业跨度大，应用范围广，共获得省部级科技进步一等奖 3 项，其他科技奖项 10 余项。

【Innovation】

The H9000 computer monitoring system involves automatic monitoring and control series products with completely independent intellectual property rights facing the water resources and hydropower as well as new energy sectors, and provides complete sets of intelligent solutions for the safe, high-efficient, reliable and steady operation and management of projects. This series of products have achieved independent innovation in system models with open distribution and without master redundancy as well as system architectures with real-time fast response, software and hardware compatibility, cross-platform applications and full distribution and high redundancy. In 1996, the Department successfully applied the system to China's first power station with closed operation; in 1997, it initially created a remote

centralized control computer system for large cascade hydropower stations. Its original technology for the fast acquisition, handling and communication of massive real-time data has solved the system performance and reliability issues of huge power stations. The visualized universal model for man-machine interactions and complete development and maintenance tools have significantly improved the construction and maintenance efficiency of the automation system. The object-oriented integrated platform focuses on addressing the interconnection, intercommunication and interaction issues of multi-disciplinary applications as well as the heterogeneous data integration issue, and is dedicated to facilitating intelligent applications and smart development in water resources and hydropower as well as new energy sectors.

【Influence】

Launched in the 1990s, the H9000 computer monitoring system has now become the nerve center of the “pillars of a great power” for China's hydropower cause through 25 years of pioneering innovation and upgrading. From the country's first power station with closed operation to the remote control of the first large cascade power stations and to the first smart supervision platform, and from “unmanned duty and guard with fewer people” to the intelligent era today, it has been standing in the forefront of the age and leading the technological advancements. This has achieved the all-around localization of the water resources and hydropower monitoring system as well as the successful popularization to the international hydropower market. The H9000 system has been applied in nearly 400 sets of water resources and hydropower projects at

home and abroad, including Three Gorges, Xiluodu, Xiangjiaba, Venezuela's Guri as well as four top 10 international hydropower stations. The H9000 regulation integration system of the largest-ever regional hydropower centralized control center has reached the international advanced level as a whole. Various new technologies and products have shaped complete sets of intelligent and smart solutions, and have been applied in new energy sector, which has provided vigorous technical support for the complementation of multiple energy sources, such as hydropower, wind energy and light energy. Crossing various industries and enjoying widespread applications, the product has won three first prizes of scientific and technological progress awards at provincial and ministerial levels and nearly 10 other scientific and technological awards.

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