Under the Framework of Sustainable Operations Solutions

Egyptian General Petroleum Corporation Hosts Expanded Forum on Immersion Cooling Technology to Enhance Data Center Efficiency and Reliability

As part of implementing the Egyptian State's vision and the Ministry of Petroleum and Mineral Resources' strategy to promote sustainability, optimize energy utilization, and strengthen digital transformation capabilities, the Egyptian General Petroleum Corporation (EGPC) organized an expanded technical forum bringing together information technology representatives from affiliated companies to discuss the latest advancements in **Immersion Cooling Technology** and its role in enhancing the efficiency, reliability, and sustainability of data center operations.

The forum highlighted the growing challenges facing modern data centers, particularly with the rapid adoption of artificial intelligence, advanced analytics, edge computing, and high-performance computing applications, all of which are driving increased power consumption and thermal loads. These challenges require innovative cooling solutions capable of supporting future digital infrastructure while reducing operating costs and environmental impact.

During the event, Dr. Mohamed Abouelmagd, Assistant CEO for Information Technology at EGPC, emphasized that the petroleum sector is continuously evaluating emerging technologies that contribute to operational excellence, energy efficiency, and sustainability. He noted that immersion cooling represents a promising technology capable of significantly reducing cooling energy consumption, improving equipment reliability, and enabling the deployment of advanced digital solutions in both data centers and remote operational environments.

The forum featured a technical presentation delivered by representatives of GRC, a global leader in immersion cooling solutions, and TDS, its authorized Egyptian partner. The presentation demonstrated how immersion cooling systems operate by fully immersing servers and electronic components in a specially engineered dielectric fluid that efficiently transfers heat while remaining electrically non-conductive. This approach enables superior thermal management, reduces dependence on conventional air-conditioning systems, and protects critical equipment from dust, humidity, oxidation, and environmental contaminants.

Participants reviewed global deployment experiences across government, telecommunications, cloud computing, higher education, defense, and enterprise sectors. Case studies presented during the session highlighted substantial reductions in cooling energy requirements, improvements in data center efficiency, higher computing density, and enhanced operational resilience in challenging environments.

The discussions also focused on the potential application of the technology within the petroleum sector, particularly in supporting digital transformation initiatives, industrial data processing, artificial intelligence workloads, and edge computing deployments in production facilities and remote field locations. The technology's ability to operate efficiently in harsh environmental conditions makes it particularly relevant for the sector's operational requirements.

In this context, Dr. Mohamed Abouelmagd highlighted that one of the most significant advantages of immersion cooling technology is its potential to substantially reduce the energy required for data center cooling operations, which traditionally represents a major portion of overall facility power consumption. He noted that international deployment experiences have demonstrated the ability to achieve significant reductions in cooling-related energy usage while improving Power Usage Effectiveness (PUE) to near-optimal levels. Such improvements contribute directly to lowering operational costs, maximizing the utilization of available electrical capacity, and supporting the petroleum sector's energy efficiency and sustainability objectives.

Dr. Abouelmagd further announced that EGPC is currently coordinating with Petroleum Pipelines Company (PPC) and technology partners to implement a Proof of Concept (PoC) deployment of immersion cooling technology at PPC facilities. The pilot project will evaluate the technology's technical, operational, and economic performance under actual operating conditions within the petroleum sector. The assessment will focus on energy savings, cooling efficiency, equipment reliability, operational resilience, and potential reductions in maintenance requirements, providing a practical foundation for evaluating broader adoption opportunities across the sector's digital infrastructure.

The forum concluded with a constructive exchange of technical perspectives among ICT managers, infrastructure specialists, and operations teams from participating companies. Attendees discussed potential pilot deployment opportunities, implementation considerations, integration with existing infrastructure, and methodologies for evaluating operational, financial, and sustainability benefits.

This initiative reflects EGPC's ongoing commitment to exploring innovative technologies that support secure, efficient, and sustainable operations while reinforcing the petroleum sector's digital transformation journey and readiness for future business and technology demands.