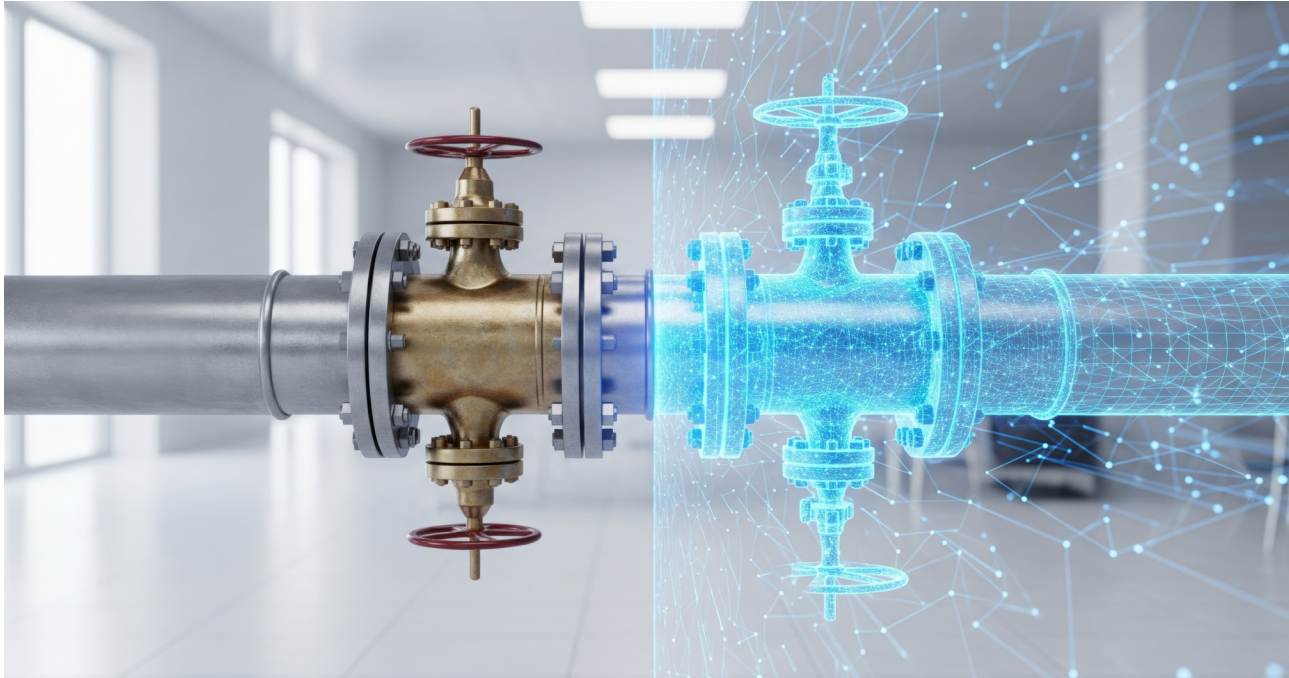


Digital Twins for Water Infrastructure



EMPOWERING RESILIENCE, EFFICIENCY AND INNOVATION

Water infrastructure owners and operators are under increasing pressure to manage aging assets, respond to climate-driven events and meet regulatory demands, while improving efficiency and reducing costs. Traditional approaches often fall short in providing real-time insights, predictive capabilities and cross-functional coordination. There's a growing need for smarter, data-driven solutions that enhance decision-making and resilience.

Integrated Expertise in Water and Digital Twins

Michael Baker International brings together deep domain expertise in water infrastructure with cutting-edge digital twin capabilities to deliver future-ready solutions. Our teams integrate engineering, operations and sensor data to create dynamic, virtual models of real-world assets, from pump stations to levees. These virtual models empower proactive management, predictive maintenance and rapid response.

WHY MICHAEL BAKER?

Foundation for Innovation

We've built a strong digital twin foundation that seamlessly integrates engineering, operational and sensor data. This framework delivers scalable solutions for asset management, risk mitigation and enhanced operational efficiency across infrastructure.

Proven Connectivity

Through real-world pilots, we have demonstrated the capability to integrate live-stream data and operational feeds into digital twin platforms. This empowers teams to visualize, analyze and act on real-time insights.

Cross-Disciplinary Collaboration

Our digital twin initiatives unite engineering, operations and emergency management, fostering a culture of innovation and continuous improvement.

WHY DIGITAL TWINS MATTER FOR WATER

Risk Reduction

Proactively manage flood risk and strengthen infrastructure resilience by simulating performance under diverse scenarios and monitoring critical indicators in real time.

Efficiency and Optimization

Enhance operations, maintenance and asset management through accurate, current data and predictive analytics.

Scalability

Apply validated workflows across asset-level and system-wide applications, supporting internal practice integration and external client delivery.

Stakeholder Alignment

Drive collaboration among engineering, operations and emergency response teams to ensure technology investments deliver measurable value.

ABOUT MICHAEL BAKER

We are a 5,100-person full-service engineering and consulting company with more than 85 years of experience rooted in technology and innovation. We specialize in cradle-to-cradle digital transformation and operational efficiencies for the built environment. Our goal is to help clients maximize asset performance, reduce costs and increase operational efficiency.

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Visit mbakerintl.com/practices/virtual-design-and-construction to learn more about our services.

Michael Baker
INTERNATIONAL

THE NEXT WAVE OF INNOVATION IN WATER

Holistic Data Integration

Unify static and dynamic data—from engineering drawings to Internet of Things (IoT) sensors—across all water assets to achieve comprehensive operational awareness.

Advanced Analytics and Visualization

Leverage digital twins for trend analysis, scenario planning and interactive operational maps that enable rapid, informed decision-making.

Continuous Innovation

Maintain efficiency and security by investing in evolving technology platforms and cross-disciplinary teams. Digital twin solutions are adaptable and built for the future.

Future Focused

Leverage digital twins to manage infrastructure, address climate challenges and ensure reliable customer service as the industry evolves.

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DIGITAL TWINS FOR WATER INFRASTRUCTURE EMERGENCY MANAGEMENT

Rapid response and secure, coordinated operations are critical, yet many organizations still depend on siloed data and manual processes. There's a pressing need for resilient, intelligent systems that enhance situational awareness, support emergency preparedness and protect critical infrastructure.

Michael Baker has deployed digital twin pilots that integrate live operational data with engineering models to create real-time, interactive representations of water assets. These platforms have proven invaluable during emergencies, enabling teams to simulate flood events, monitor critical indicators, and coordinate response efforts securely and efficiently. By connecting live operations data (SCADA, IoT, etc.) with engineering models, we deliver dynamic, living representations that bolster infrastructure resilience, improve emergency readiness and build stakeholder confidence.

Our pilots empower teams to:

- Visualize system performance in real time.
- Simulate emergency scenarios.
- Optimize maintenance schedules.

UNIFIED DATA AND PREDICTIVE ANALYTICS

Leading water agencies are embracing digital twin ecosystems that unify static engineering data, geospatial models and dynamic sensor feeds into a single intelligent platform.

These integrated systems leverage cloud computing, IoT integration, and predictive analytics to deliver real-time operational awareness and actionable insights. By simulating asset performance, forecasting maintenance needs and modeling emergency scenarios, digital twins enable water utilities to make faster, data-driven decisions.

Key Benefits:

- Minimize downtime.
- Optimize capital planning.
- Strengthen regulatory compliance.
- Improve coordination across engineering, operations and emergency response.