

ENGINEERING ONSITE POWER FOR AVK'S HYPERSCALE DATA CENTERS IN IRELAND

Business Challenge

AVK needed to deliver onsite power generation capacity at hyperscale data center sites in Ireland, where grid connection was not a near-term option.

Key challenges included:

- Designing and integrating complex multi-system plants within **compact, constrained site footprints**
- Meeting **stringent data center uptime and availability requirements** with no margin for error
- Ramping up detailed engineering delivery at pace to align with **aggressive programme schedules**
- Managing **interdependencies across mechanical, electrical, process, safety, and civil systems**
- Ensuring long-term operability, maintainability, and flexibility for future capacity changes

Overview

As hyperscale data centers expand at pace, grid limitations and prolonged connection timelines increasingly leave operators with no viable option but to deploy onsite power generation. For AVK, a developer and operator of power plants supporting hyperscale data centers in Ireland, this meant executing a technically complex, time-critical programme in partnership with Wärtsilä as engine technology and plant equipment provider and Cyient as the balance of plant engineering partner.

Cyient's role was to integrate all systems around the engines, engineering a complete, safe, and operationally robust plant within fixed site and permitting constraints. The result is a proven, scalable delivery model that enables confident deployment of mission-critical generation infrastructure.

The Cyient Solution

Cyient applied a domain-first approach to deliver detailed balance of plant engineering, providing large numbers of experienced resources to support a fast-paced programme. The focus was on integrating complex systems within compact footprints while maintaining long-term operability.

Master Plant Layouts

Developed within fixed site and building constraints, optimising space utilisation across all plant systems.

Process Engineering

Designed system interconnections and process flows to ensure safe, efficient plant operation.

Piping Design

Full piping routing, supports design, and coordination across mechanical and structural interfaces.

Electrical Design

Containment, cable routing, earthing, and lightning protection across all site areas.

Safety Engineering

Evacuation layouts, safety signage, emergency stop philosophy, and hazardous area classification.

Mechanical Utilities

HVAC, domestic water systems, and mechanical utilities designed for operational reliability.

Maintenance Strategy

Plant replacement and maintenance strategies to support long-term asset performance.

OEM-Agnostic Framework

BOP design deliberately engineered to be reusable across different OEMs or future sites.

Wärtsilä supplied the proven engine technology and plant equipment as an OEM, while Cyient delivered the engineering around the engines and plant equipment, a complementary model that allowed each partner to focus on its core strengths. Cyient was selected based on its extensive experience delivering power plant engineering across the US, EU, and UK, along with its ability to ramp up teams quickly and support complex, large-scale programmes, ensuring delivery certainty aligned to data center timelines.

The Results

These outcomes established a reliable, repeatable delivery model for mission-critical onsite power generation, giving AVK a confident path to deployment regardless of grid constraints.

Delivered complete BOP engineering for Wärtsilä-engine plants supporting hyperscale data centers in Ireland

01

Integrated **complex, multi-discipline systems** within fixed permitting and site constraints

02

Rapid team mobilisation ensured programme milestones were met in line with data center go-live requirements

03

Produced **OEM-agnostic engineering frameworks** enabling the same delivery model to be applied to future sites and alternative technology suppliers

04

Established a **scalable, repeatable blueprint** for data center power plant delivery, reducing risk and improving project certainty across the programme

05

Strengthened AVK's ability to **respond confidently to future hyperscale demand** with a proven, bankable delivery approach

06



Designing Tomorrow Together

With Wärtsilä's engines and Cyient's engineering, AVK now has a proven, repeatable model for powering hyperscale data centers, grid or no grid. Complementary strengths. Integrated delivery.

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