PROJECT CASE STUDY

Moisture Control System — FAP Polyol Oil Storage Facility

Location	Tema, Ghana
Client	FAP
Duration	4 months
Role	Detailed Design and Material Procurement
Scope	Dry Air / Nitrogen Moisture Control System, Tank Safety Accessories, Pressure Control Equipment

PROJECT BACKGROUND

FAP operates a polyol storage facility at Tema, Ghana's primary industrial port and petrochemical hub. Polyols are highly hygroscopic chemical intermediates: exposure to atmospheric moisture during storage triggers hydrolysis reactions that degrade product quality, generate contaminants, and shorten usable shelf life. For a storage operator handling polyols at industrial scale, controlling moisture ingress is therefore not a routine maintenance issue but a core product-protection requirement.

The project objective was to design and procure a complete moisture control system for FAP's polyol storage tanks — covering the inert atmosphere generation and distribution circuit, the associated tank safety accessories, and the pressure control equipment required to keep the tanks operating safely under all loading, unloading, and ambient temperature conditions.

SCOPE OF SERVICES

- **Detailed Design** — full engineering design of the dry air / nitrogen blanketing system for the polyol storage tanks, including the inert gas supply circuit, distribution piping, tank connections, and the pressure-vacuum control architecture.
- **Tank Safety Accessories** — specification and integration of the safety accessories required to protect the tanks under blanketing operation, covering pressure-vacuum relief, flame protection, and emergency venting in line with applicable storage codes.
- **Pressure Control Equipment** — design of the automated pressure regulation circuit controlling the blanket gas supply and the relief setpoints, ensuring stable internal pressure during tank breathing, product transfer, and ambient temperature swings.
- **Material Procurement** — technical specifications, vendor qualification support, and procurement of equipment for the complete moisture control package.

THE DESIGN SOLUTION

The system was engineered to maintain a continuous dry inert atmosphere above the stored polyol, isolating the product from ambient moisture under all operating modes. Blanket gas supply is regulated automatically against tank pressure: gas is admitted as tank pressure falls (during product outflow or temperature contraction) and excess pressure is relieved through dedicated safety devices (during product inflow or temperature expansion). The combination of automated pressure regulation and properly specified safety accessories was sized to handle the worst-case filling, emptying, and thermal transient scenarios for the FAP tank fleet, while keeping operator intervention to routine inspection and verification only.

KEY OUTCOMES

- **Product Protection** — the moisture control system was designed to prevent hydrolytic contamination of stored polyol and to extend usable shelf life by maintaining a dry inert atmosphere inside each tank at all times.
- **Automated Pressure Control** — the automated regulation circuit maintains optimal storage conditions across loading, unloading, and ambient temperature cycles with minimal operator intervention required.
- **Safety Compliance** — the integrated tank safety accessories ensure that the tanks remain protected against both over-pressure and vacuum scenarios under all anticipated operating conditions.
- **Rapid Delivery** — the full detailed design and material procurement scope was completed within a four-month programme, allowing FAP to bring the moisture control system into service without extended downtime to the storage facility.

DISCIPLINES COVERED

Process • Mechanical • Piping • Instrumentation and Control • Storage Tank Engineering • Hazardous Product Storage • Safety Engineering

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