

## Pasta plant Zambia

## Engineering Consistency in Food Production

### Precision in Batch Variability

## The Challenge

### The Complexity of Batch Variability

For this large-scale pasta production facility situated in Zambia, maintaining structural integrity and food safety depends on high-precision environmental control. In manual or semi-automated environments, several critical pain points often emerge:

- **Inconsistent Textures:** Variations in the vertical lift speed and drying times can lead to product clumping or uneven moisture levels.
- **Asset Vulnerability:** Without automated speed synchronization, vertical elevators like Archimedes screws are at risk of mechanical jams if overfed by the main conveyors.
- **Reactive Quality Control:** Operators often only identify drying errors (such as "checking" or cracking) after the pasta has left the long-stage dryers, leading to high waste.

## SPG Solution

SPG Control & Automation implemented a sophisticated "digital brain" to manage the high-volume production line, replacing manual guesswork with a centralized control architecture. The solution focused on three technical pillars:

- **Synchronized Motion Control:** We integrated Variable Frequency Drives (VFDs) and photo-eye sensors to ensure the vertical Archimedes screw and vibratory feeders operate in perfect harmony.
- **Autonomous Climate Regulation:** The system utilizes a PLC-driven PID loop to automatically adjust heat and exhaust fans within the drying tunnels based on real-time humidity feedback.
- **Safety & Operational Interlocks:** Automated shutdown protocols and physical interlocks protect the high-volume equipment and staff the moment a mechanical or thermal parameter falls outside safety limits.

## SPG Results

By modernising the control infrastructure, the plant transitioned from a state of constant manual checking to optimized, data-driven production:

- **Guaranteed Product Integrity:** Automated environmental control has eliminated the human error associated with manual drying adjustments, resulting in a consistent, high-quality final product.
- **Extended Asset Life:** By automating the protection of the vertical lift systems and conveyor motors, the facility has significantly reduced mechanical wear and maintenance costs.
- **Operational Peace of Mind:** With an instant HMI alert system, operators can now focus on high-level optimization rather than reacting to line blockages.
- **Increased Profitability:** Reducing product waste and labor-intensive manual logging allowed the facility to reallocate resources toward expanding production capacity.

At SPG Control & Automation, we believe technology should empower your team, not complicate their lives.

