



Industrial Mixing Tank Control System

Automating fluid mixing processes using PLC-based control for efficient industrial operations.

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Project Objectives

1 Automate Mixing Process

Develop a PLC-controlled system for filling, mixing, heating, and draining fluids in an industrial tank.

2 Implement Ladder Logic

Create and deploy a ladder logic program in OpenPLC for precise control of the mixing tank operations.

3 Simulate and Verify

Test the system using virtual or hardware-based sensors and actuators to ensure proper functionality.

System Overview

The Industrial Mixing Tank Control System automates fluid mixing processes using PLC-based control. It manages tank filling, timed mixing, heating, and level control through ladder logic programming in OpenPLC.

Key components include:

- Level sensors for tank filling control
- Temperature sensors for heating regulation
- Solenoid valves for fluid flow management
- Mixer motor for fluid homogenization
- Heater element for temperature control





Implementation

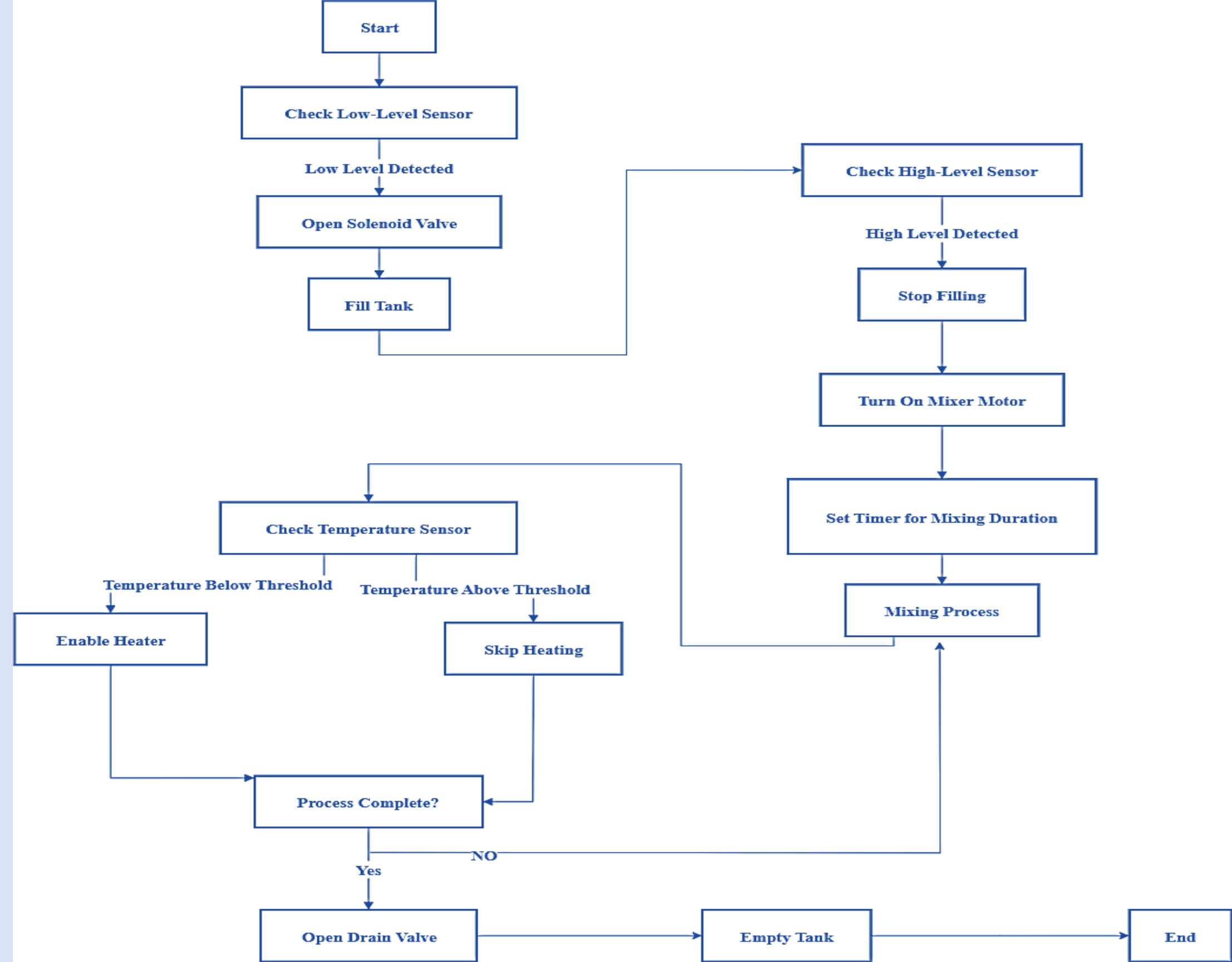
Hardware (components for simulation)

- Level Sensors (Low and High)
- Temperature Sensor
- Solenoid Valves
- Mixer Motor
- Heater Element

Software

GMWIN_V4.18 Software for building and simulating the project using Ladder Diagram.

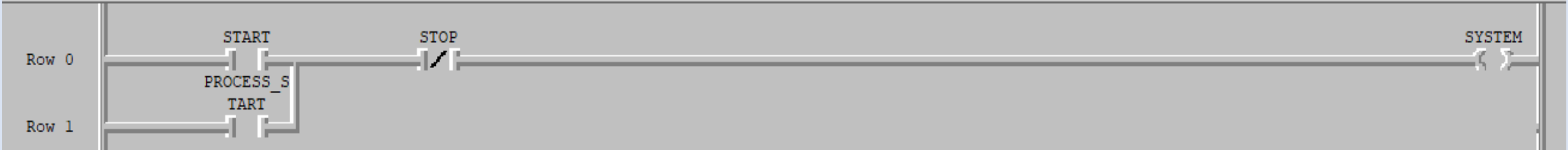
Flow Chart



Ladder Logic Structure & Simulation Results

Below is the Step by step ladder logic design and simulation results:

1. Starting System



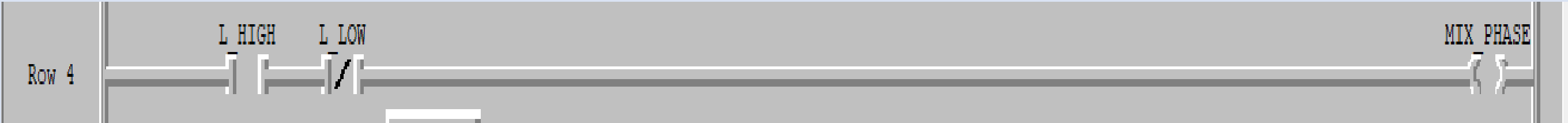
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2. Filling Logic



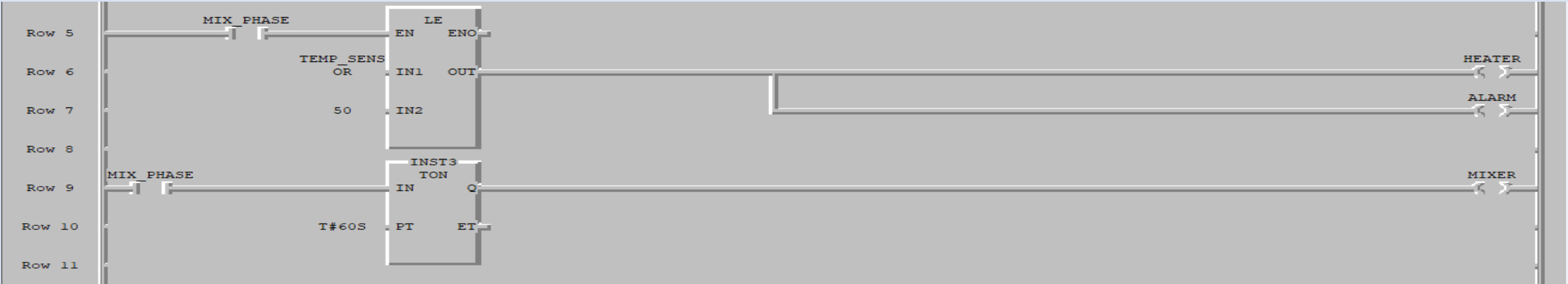
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3. Filling Stop



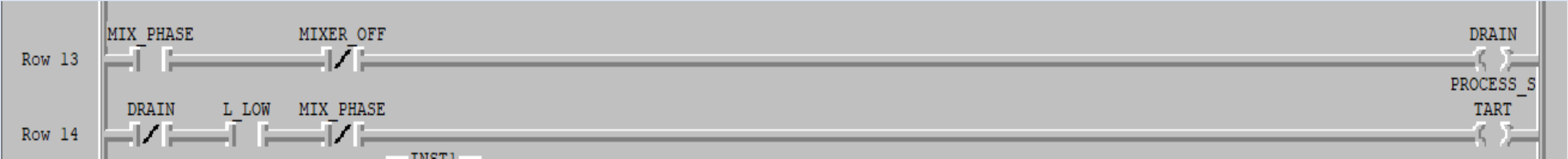
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4. Mixing Phase



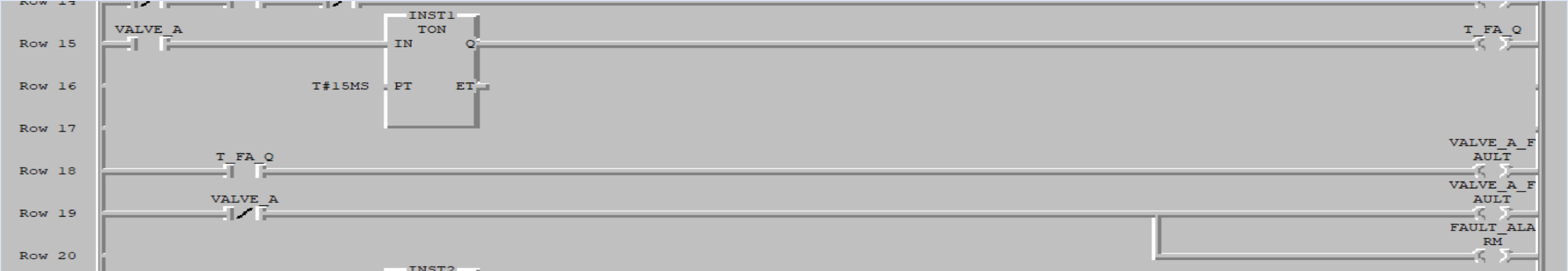
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5. Draining and Restarting Process



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6. Valves Fault Detection



Conclusions

Automated Precision

PLC-based system ensures precise control of tank filling, draining, mixing, and temperature regulation.

Enhanced Safety

Includes fault detection mechanisms for valves, preventing overflows and process disruptions.