

REQUEST FOR PROPOSAL (RFP)

Liu PLC

PROJECT OVERVIEW

Name: Forge Nicholasville Automation Retrofit

Type: Automation Retrofit

Location: South Nicholasville, NJ (Factory Complex)

Industry: Manufacturing

Value: \$14,445,556

Complexity: 3/5

Date: April 09, 2025

Disciplines: Electrical Engineering, Mechanical Engineering, Process Engineering

Regulations: OSHA Regulations, ASME Standards

SCOPE OF WORK

Scope of Work: Generic Automation Retrofit Project

Project Goal: To upgrade existing manufacturing processes within a factory complex through automation retrofitting, improving efficiency, safety, and throughput. Complexity Level: 3/5

I. Electrical Engineering

1. PLC System Upgrade: Replace the existing PLC system (Allen-Bradley PLC-5) with a modern, scalable Rockwell Automation ControlLogix system. This includes programming the new PLC with updated control logic, HMI development using FactoryTalk View SE, and integration with existing SCADA system via Ethernet/IP communication, adhering to IEC 61131-3 programming standards. Deliverables include updated PLC program, HMI screens, and wiring diagrams.
2. Motor Control Center (MCC) Modernization: Retrofit the existing MCC with new variable frequency drives (VFDs) for improved motor control and energy efficiency. This involves replacing outdated contactors and overload relays with modern solid-state equivalents, ensuring compliance with NFPA 79 standards. The project will include detailed electrical schematics, panel layouts, and a comprehensive bill of materials.
3. Safety System Enhancement: Implement a new safety PLC system to enhance machine safety and personnel protection. This will involve integrating emergency stop circuits, light curtains, and interlocks with the main PLC using a safety-rated communication protocol such as PROFIsafe. Documentation will include functional safety assessment according to IEC 61508 standards.

II. Mechanical Engineering

1. Conveyor System Optimization: Redesign and modify a 50-meter long roller conveyor system (using 3-inch diameter rollers, made of steel with 1000-lb capacity) to incorporate automated sorting and stacking capabilities. This involves designing and fabricating new components, including robotic arms (specifications to be determined in detail design), and integrating them into the existing conveyor frame using suitable structural steel components. Deliverables include detailed CAD drawings and a bill of materials for fabricated parts.
2. Robot Integration: Integrate a 6-axis industrial robot (Fanuc R-2000iB/1200R) into the existing manufacturing cell for automated part handling and placement. This includes designing and fabricating necessary robot end-effectors and fixtures for precise handling, creating safety guarding conforming to ANSI/RIA R15.06-2012, and programming the robot using RAPID programming language. Detailed robot programs and safety risk assessment are required.

III. Process Engineering

1. Process Optimization Study: Conduct a detailed process optimization study of the existing manufacturing line using Lean Manufacturing principles. This will involve mapping the current state value stream, identifying bottlenecks, and proposing improvements to the material flow and workflow. Deliverables will include a value stream map, process improvement recommendations, and a cost-benefit analysis of proposed changes.
2. Data Acquisition and Monitoring: Implement a data acquisition system to collect real-time process parameters (temperature, pressure, flow rate etc.) from critical equipment. The system will interface with the existing PLC and SCADA systems, allowing for remote monitoring and data analysis using historian software. The system should conform to ISA-88 standards for batch control systems, ensuring data integrity and traceability.

IV. Cross-Disciplinary Tasks

1. HAZOP Study: Conduct a Hazard and Operability study (HAZOP) encompassing all aspects of the retrofit to identify potential hazards and recommend mitigative measures. This will involve collaborative sessions between electrical, mechanical, and process engineers, resulting in a HAZOP report with detailed recommendations for hazard elimination or risk reduction.

2. Integration Testing & Commissioning: Perform comprehensive integration testing and commissioning of the upgraded system. This includes verification of PLC programs, robot operation, conveyor performance, safety system functionality, and data acquisition system accuracy. Collaboration between all disciplines is crucial to ensure seamless operation of the fully integrated system.

Complexity Impact Note: The complexity level (3/5) reflects the need for significant system integration and process optimization, requiring a moderate level of engineering expertise and project management.

REQUEST FOR QUOTATION

Request for Quotation: Forge Nicholasville Automation Retrofit

Project: Forge Nicholasville Automation Retrofit, South Nicholasville, NJ

Industry: Manufacturing

Issued: April 9, 2025 Due: May 1, 2025

Project Goal: Upgrade existing manufacturing processes through automation retrofitting, improving efficiency, safety, and throughput.
Complexity: 3/5

Scope of Work: A comprehensive automation retrofit encompassing electrical, mechanical, and process engineering aspects (detailed scope attached). This includes PLC system upgrade (Rockwell Automation ControlLogix), MCC modernization, safety system enhancement, conveyor system optimization with robot integration (Fanuc R-2000iB/1200R), process optimization study, data acquisition system implementation, HAZOP study, and integration testing/commissioning.

Required Deliverables:

- * Detailed technical design (1-2 pages)
- * Comprehensive cost breakdown
- * Updated PLC program, HMI screens, electrical schematics, CAD drawings, robot programs, HAZOP report, value stream map, process improvement recommendations, and all relevant documentation.

Qualifications: Minimum 3 years of experience in manufacturing automation retrofits; proven regulatory compliance (NFPA 79, IEC 61131-3, IEC 61508, ANSI/RIA R15.06-2012, ISA-88).

Evaluation Criteria: Technical Approach (50%), Cost (30%), Experience (20%).

Project Timeline:

- * RFQ Release: April 9, 2025
- * Questions Due: April 22, 2025
- * Proposals Due: May 1, 2025
- * Project Start: April 29, 2025
- * Project Duration: 9 months

Contract Type: Time & Materials

Submission: Submit proposals electronically to procurement@manufacturing.com. Include all requested deliverables.

Contact: [Insert Contact Name and Phone Number Here]

(Attached: Detailed Scope of Work as described above)

CONTACT

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TIMELINE

Include key dates such as submission deadlines, inquiry deadlines, and project start dates.