**Purdue Project Final Report**

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The SCADA system designed throughout this semester focuses on a water treatment plant, aimed at filtering and purifying undrinkable water. The primary objective of this SCADA design is to ensure that people in surrounding areas, whether in the city or countryside, have access to safe, filtered drinking water. Additionally, the design addresses the security of IoT devices, internet connections, and physical security measures.

At the foundational level, ground zero devices ensure the flow and reliability of the filtration system. These include the Flow Sensor, pH Sensor, and Chlorine Sensor, all feeding data into the PLC, which then controls the Water Pump and Control Valve. Supporting this are the UPS system, RTU, and Cisco Switch, ensuring that all components are interconnected, and data is transferred throughout the system seamlessly.

The next critical components are the IPS, SCADA Monitoring Station, and Historian. These provide layers of security, monitoring the water and filtration processes while logging essential data for future reference. Moving further up, the ERP, BI Tools, CRM, DBMS, and Data Recovery Appliance, along with the IAM system, play crucial roles in monitoring, controlling, analyzing, recovering, and storing key information, such as employee data, machine code, and programming logic.

With all these systems in place, the water treatment plant becomes secure, reliable, efficient, and well-equipped for continuous operation.

**Costs For Each Layer:**

Oracle ERP: $10,000 - $50,000

MySQL DBMS: Free

Power BI: $1,000 - $5,000

Salesforce: $25-300/month (~$3,600 per year)

Okta: $2-15/month (~$180 per year)

Dell EMC Data Domain 3300: $10,000 - $50,000

Siemens WinCC: $3,000 - $5,000

APC Smart-UPS 1500VA: $400 - $700

OSIsoft PI System: $10,000 - $50,000

CISCO Router: $500 - $5,000

Alto Physical Firewall: $2,000 - $5,000

CISCO Firepower IPS: $1,300 - $4,000

APC-Smart UPS: $400 - $700

Flow Sensor (Rosemount 3051S Differential Pressure Transmitter): ~$1,200

pH Sensor (Endress+Hauser CPS11D): ~$400

Chlorine Sensor (ABB 4630-1000 Free Chlorine Sensor): ~$1,000

Allen Bradley CompactLogix PLC: ~$2,500

Grundfos CR 10 Pump: ~$3,500

RSLogix 5000: ~$7,800 per year (licensing)

The total cost of this water treatment would be between $55,280 - $245,180.