**Purdue Project and Weekly Assignments – Level 0-1**

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The industry I will be researching and developing for is Water Treatment. I will be talking and explaining the water treatment process, with several stages including filtration, chemical treatment, and water distribution. To begin, the main process will be to monitor and control various stages of the water treatment process. First we will be filtrating the water that passes through filters to remove any impurities. After filtration, we will be adding chemicals, which will disinfect and adjust the pH of the water. Finally, we will be distributing the water into storage tanks to be used directly in homes or businesses.

For Level 0, we are monitoring the water flow, pressure, temperature and chemical level (e.g., chlorine, pH sensors). We will also have actuators which have control valves, pumps, and motors that move water or adjust the chemical levels.

For level 1, we will have main controls-PLC’s and RTUs. We will have a control which will handle the pumps and valves, and the monitor, which will receive data from the sensors and send commands to the actuators to adjust the water flow or chemical treatment.

The devices we will be using are Flow Sensors, pH Sensors, Chlorine Sensors, Pumps and Motors, and Control Valves. For level 1 equipment, we will be using PLCs that read sensor data and controls pumps and valves, and RTUs which may be used to control remote sits and pump stations.

**Equipment and Costs**

* **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).
* **PLC: Allen Bradley CompactLogix** (~$2,500).
* **Pump: Grundfos CR 10** (~$3,500).
* **Software: RSLogix 5000** (~$7,800 per year for licensing).