

A DISTRIBUTED AND COLLABORATIVE PLC LAB FOR THE SPALLATION NEUTRON SOURCE*

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The control system for the Spallation Neutron Source (SNS) will be developed collaboratively at five different national laboratories. We expect that PLCs will be used heavily in the system. Several of the collaborating labs have experience with PLC systems, but not all use the same hardware and some of the hardware is obsolete. New PLC technology is now available. A collaborative and distributed PLC development lab has been established to help select the most suitable industrial systems and devices for the SNS project. In this paper, we present the configurations, features, performance, reliability and a cost comparison of the prototype systems we have reviewed. The selected PLC development projects cover the following areas: using soft PLC; linking PLCs with TCP/IP based protocols or the ControlNet(TM) network; integrating input/output modules via the DeviceNet(TM) network; using PLC I/O modules such as Flex-I/O(TM) and G3 without ladder-logic to exploit their form-factor and electrical properties; and comparing the low-cost PLC systems versus the most popular used brands. The integration of the PLC prototypes with EPICS will be discussed.