

## Memo

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*to:* RSC

*from:* D. Beavis 

*subject:* Commissioning of the Operator-Less Controlled Access System at NSRL

### **Commissioning of the Operator-Less Controlled Access System at NSRL**

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In this report we summarize the results on the recent testing and commissioning of the NSRL operator-less controlled access system. Problems encountered during the four-week commissioning period were dealt with recently, and we here report on the test of the modified system.

The system was used under the watchful eye of MCR and HP operators, whose task was to record instances of sweep loss, hardware-faults and any other problem they saw. They had the means to drop the sweep any time our activities during access made them uncomfortable in any way, which they never had to resort to.

During the approximately four weeks of testing we used the system about 1600 times, and experienced 65 sweep losses. Of these, 50 were caused by failure to properly read RFID cards. These failures are understood, preventable by proper handling of the RFID cards, and are not a safety concern.

There were, however, some 15 sweep losses which were not understood at the time. It is important to note that *none of these sweep losses ever resulted in an unsafe condition*. After the run we initiated an investigation into these anomalies, and all evidence pointed to the PLC software as the root cause of the problem. The hardware was deemed to be reliable. A new engineer was assigned to fully review the PLC code, and make modifications where necessary. While the basic program logic remains unchanged, the code has been streamlined and potential race conditions eliminated. The modified code was fully tested on February 24<sup>th</sup> 2010, and found to meet all specifications. Furthermore, we are now unable to recreate any of the unexpected sweep losses experienced with the first version.

Because there have been some modifications made to the PLC code, we feel it advisable for the system to remain under MCR observation for an additional two week period. At the end of this period, assuming reliable operations, we would like to release the system for use. Also, it is desirable that during the two week observation period the resetting of the Access PLC following a sweep loss be a local function, as opposed to requiring the intervention of an MCR operator. Waiting for release to implement this would require PLC modification and testing during the run, which could prove to be very difficult.