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LANSCE accelerator instrumentation and control technology choices

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From being the first computer-controlled accelerator, through its 52-year long operational history, today the LANSCE Instrumentation and Control System (LICS) shows little resemblance of its early days. Over the past 5 decades, generations of control system engineers were faced with the challenge of maintaining the LICS. However, its maintainability depends on the ability that a failed component or system can be restored or repaired. Complicating this task is the undeniable fact that technology has significantly evolved over the last decades and that older component and systems, while still performing their function, have become obsolete and unmaintainable. When a technology migration path isn't viable to ensure LICS maintainability, the only alternative and opportunity is to upgrade to a new technology platform. Consideration needs to be given that the new technology platform needs to seamlessly integrate with the existing LICS infrastructure while allowing for technological progress. Given LICS's technology complexity multiple dependencies make the migration and upgrade paths a challenging one. In this paper, we discuss technology choices and compromises made, technology migration and upgrade challenges still faced, and LICS vision for the future. All this under the budgetary and schedule constraints of an operating accelerator facility with an enduring mission.

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