An Automated Change Process for Embedded Controller Software of a Full Authority Digital Engine Control System

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Abstract
A Full Authority Digital Engine Control (FADEC) system is used in the development and testing of aero-engines and its derivatives at the Gas Turbine Research Establishment. This system incorporates a dual-redundant Digital Electronic Control Unit with embedded software performing control functions. In the development phase of the engine, the control schedules and algorithms are continuously evolving resulting in frequent changes in the control software. Consequently, numerous software versions called builds are generated for different engines. The embedded software, being an extremely critical component of the control system, demands a high degree of reliability in the change management practices. Manual software changes carried out on a large scale are not only error prone but also time consuming thereby leading to slippages in stringent deadlines and entail high cost of correction. Hence, to enhance the reliability and quality of the software, a robust fully automated software change management process has been developed. This process ensures shorter turnaround time and minimizes human errors thereby improving the quality of the safety critical embedded software. This automated change process has been very useful in reducing the development and testing time of the aero-engines and its derivatives.

References

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