

Using Continuous Integration in the development and verification of a new central controller for JET

Tuesday, 16 July 2024 11:30 (20 minutes)

In the final year of JET's operation new requirements were requested which were not possible with the current central control mechanism used in plasma control operations. The new requirements provided us with a justification to replace the system entirely to expand its operational capability and improve the user experience and processes. Given the nature of the system being replaced, it was necessary to successfully carry out thorough levels of testing to ensure that the replacement system behaved identically to the previous, whilst providing new functionality.

In order to achieve this, we used Gitlab's continuous integration practices in pipelines. The added advantage of this is that developers could have their work verified with each commit prior to merging new developments. Using pytest we were able to define both unit and system level testing comparing JET signal data input to the system and the actuator output, comparing this with complex pulses previously recorded in JET. Using a dockerized yocto environment on remote hardware we were able to perform performance testing in parallel to ensure correct signal data and sufficient timing. The outcome was a robust methodology of testing new code and maintaining confidence in the new system prior to delivery on JET.

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Session Classification: Next Steps/new Fusion devices technologies: Challenges and Opportunities

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