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P4.044 Operational experience And evolution of the Real Time Protection Sequencer on JET

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The Real Time Protection Sequencer allows the Session Leader to program magnetic and kinetic actuators in response to alarms. We will deal with the State Diagram, actuator conflicts and Jump to Termination, which drove the changes to the software and architecture in [1].

The State Diagram determines what happens when one response type follows another, e.g a main chamber hot spot response is followed by a request for a divertor hot spot response and ensures that this is re-directed to a combined response type. The State Diagram is defined in a transition table and is changeable to correct flaws or meet new experimental requirements, as will be shown.

Actuator conflicts arise from the integration with older systems, but were not resolved. This is now done by defining rules which identify such conflicts at the pulse design stage and guide the SL towards a valid set up. This move from the real time code to the pre-pulse preparation and validation will be discussed.

Jump To Termination (JTT) allows us to jump forward to a preset time in the pulse in response to an alarm. This is a difficult to implement on JET due to the Central Timing System and the distributed nature of control. All subsystems and operators have to understand JTT in the same way. It has proved extremely powerful, but there are pitfalls. It can only be the first response, the transitions are the same as if reached naturally, and subsequent stops take their definitions from the correct time window.

[1] J Edwards *ibid*.

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