Implementing a Finite-State Off-Normal & Fault Response (ONFR) System for Robust Disruption Avoidance in Tokamaks

- **ONFR provides critical event handling features**
  1. Sequential responses to cascading events
  2. Event recovery
  3. Simultaneous handling of multiple events
  4. Actuator prioritization

- **Implemented as finite-state logic system**
  - Compact representation of complex logic
  - Tokamak state always well-defined

- **ONFR operating in DIII-D, KSTAR, & EAST PCS**
  - Demonstrated handling of cascading & simultaneous faults (NTM→Locked Mode + hardware faults) to bring highly unstable plasma to safe termination

DIII-D
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