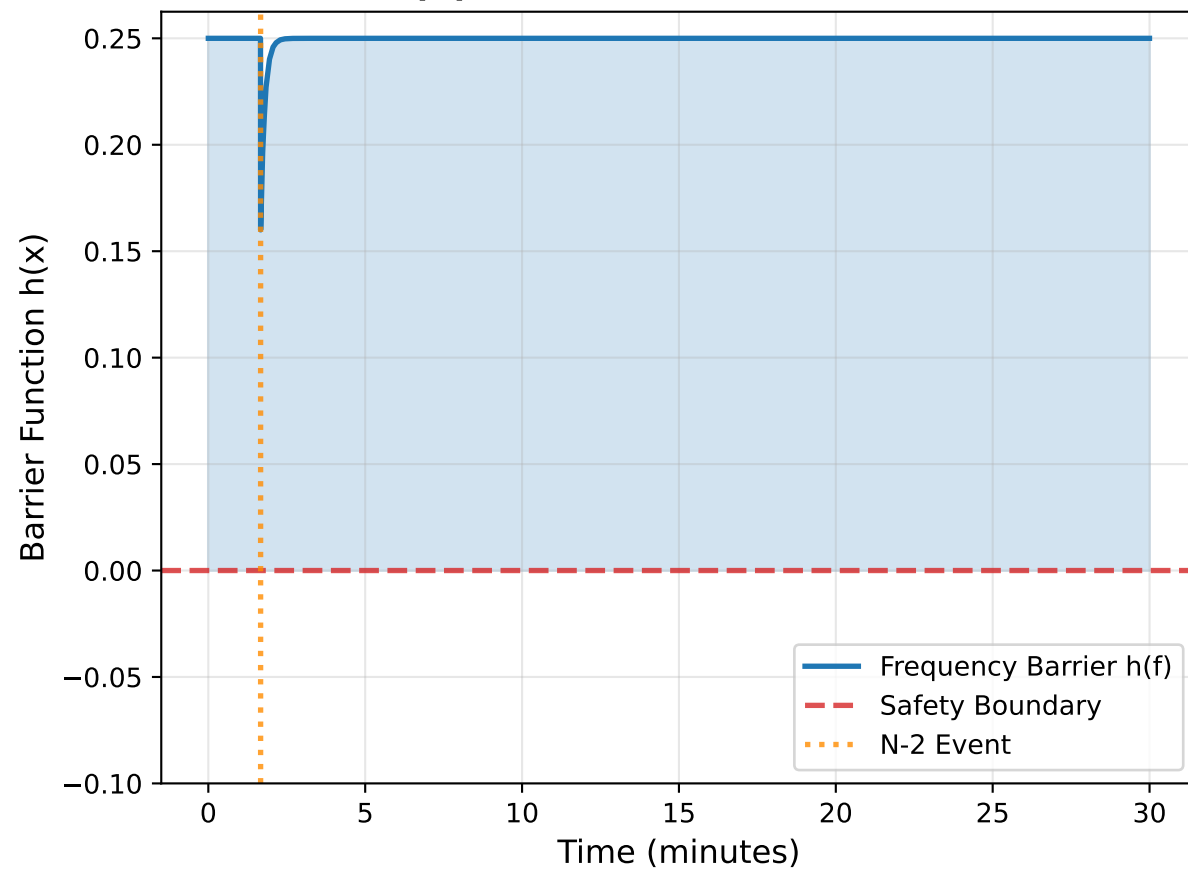


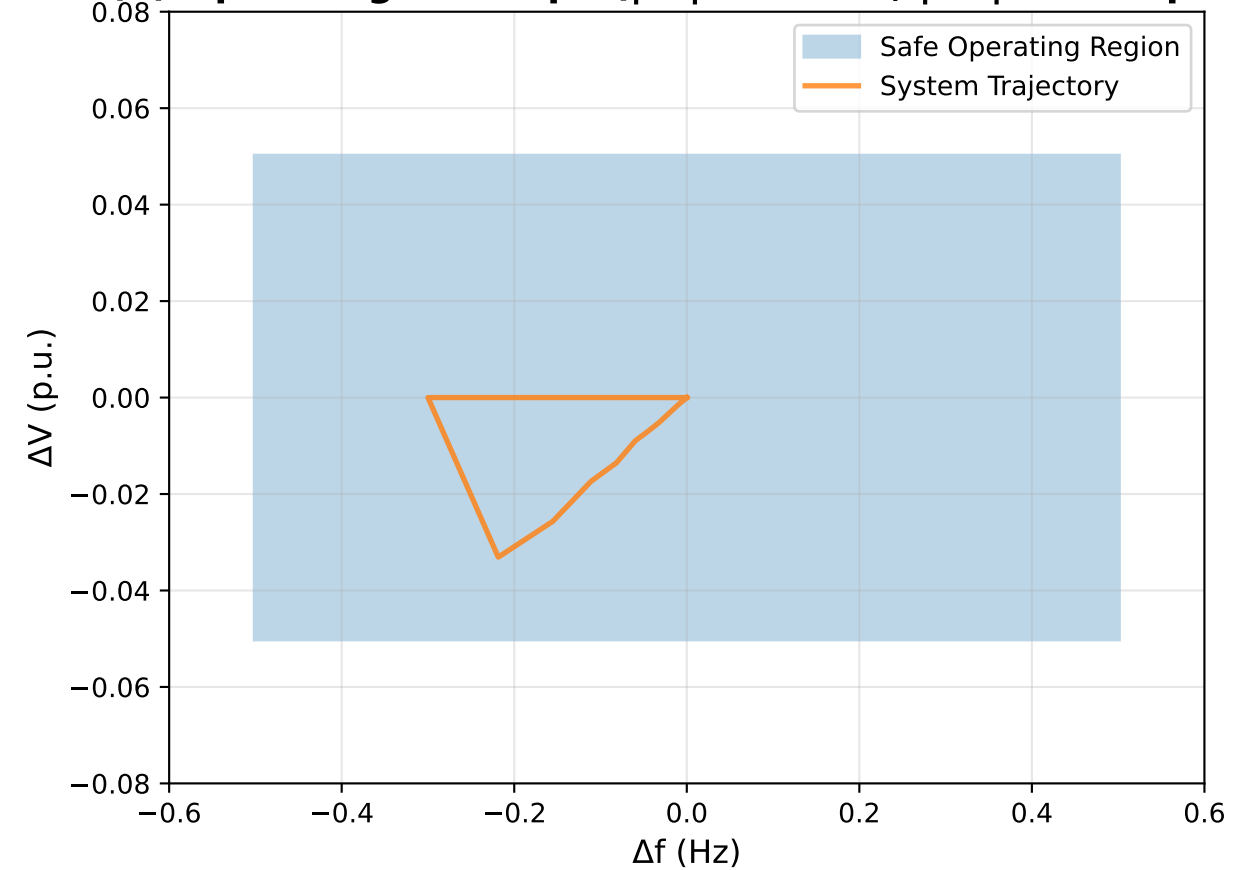
Control Barrier Function Safety Verification - Realistic Simulation

Test Conditions: Delay = 150ms (jitter 10-150ms), Packet Loss = 20%, Event Dwell = 200ms, $h(f) = 0.5^2 - \Delta f^2$, $dt = 0.1s$

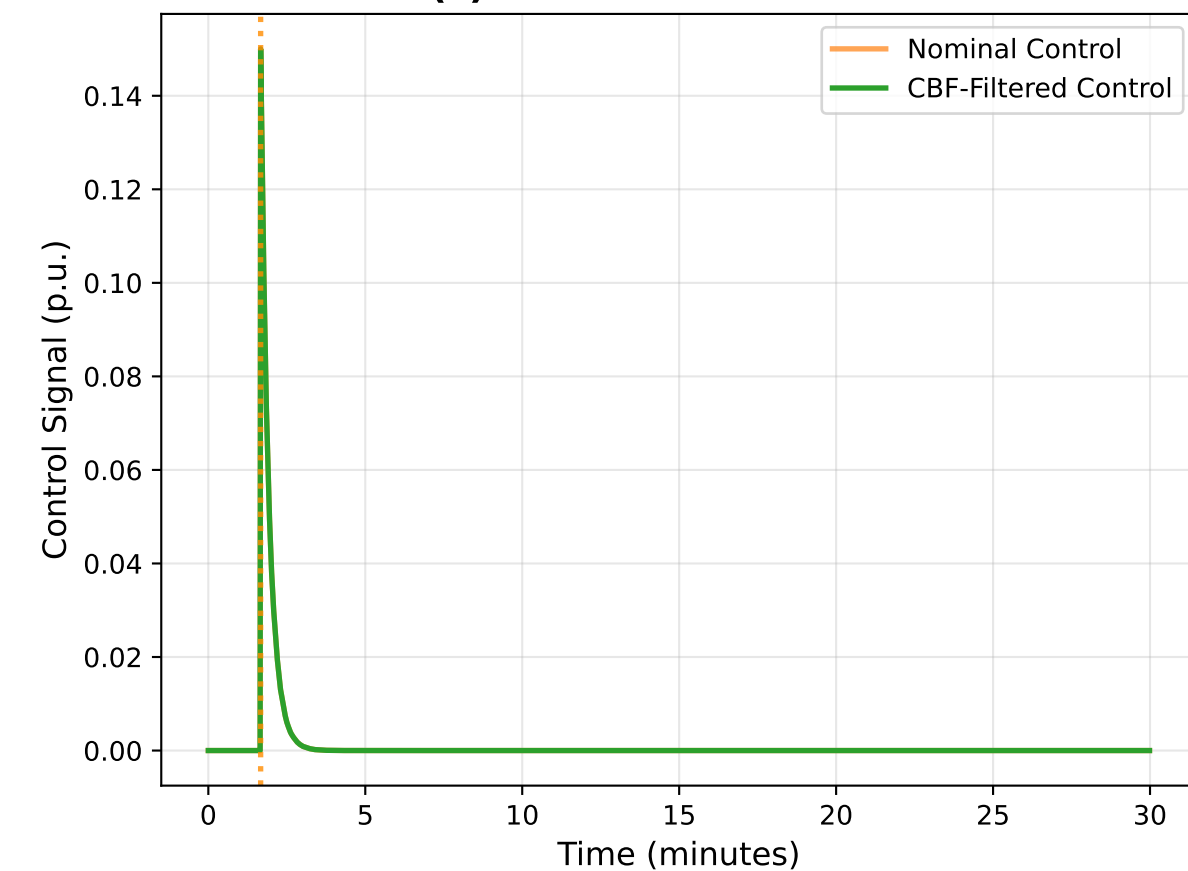
(a) Real Barrier Evolution



(b) Operating Envelope ($|\Delta f| \leq 0.5$ Hz, $|\Delta V| \leq 0.05$ p.u.)



(c) Control Modification



(d) N-2 Contingency Response

