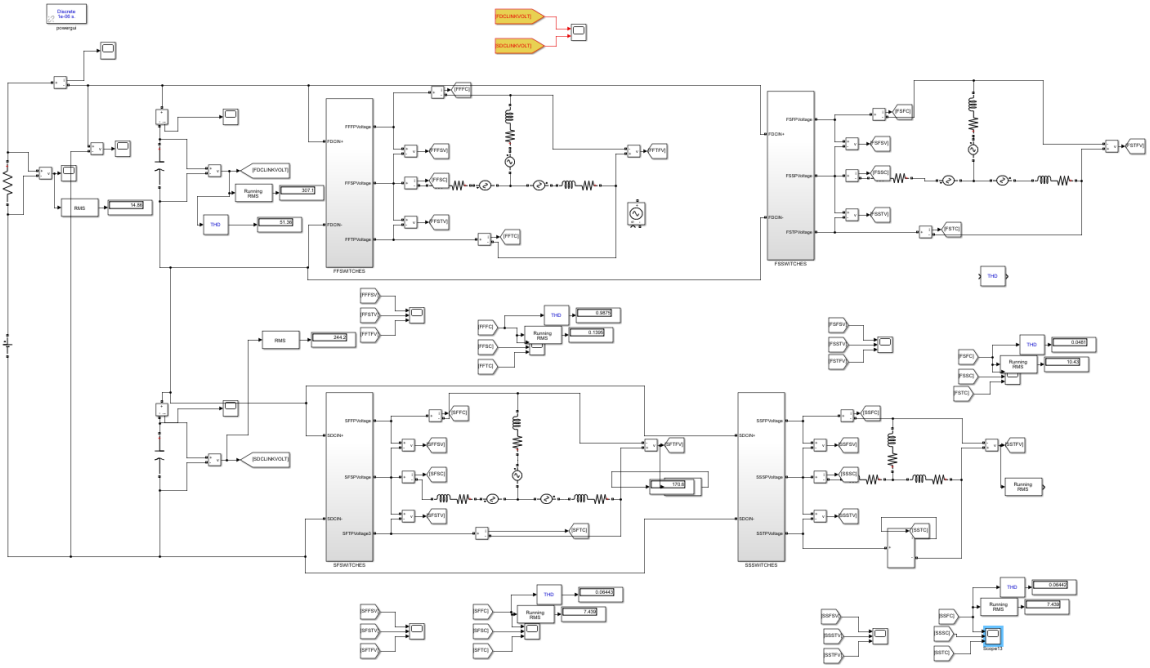

Steps of Building Fault Tolerant System

1- Fault Estimation

2- Fault Tolerant Builds

3- Fault Detection

4 – Fault Diagnosis

5- Fault-Mode Operation

Most common failures in the electric motor & drive system

Cause of failure	Failure rate/phase (per hour)
Open-circuit in windings	1.3×10^{-5}
Open-circuit in connections	1×10^{-6}
Open-circuit in others	0.4×10^{-6}
Short-circuit between phases	6.7×10^{-6}
Short-circuit in connections	1×10^{-6}
Short-circuit in others	0.4×10^{-6}
Total electrical failure	**6.6×10^{-5}**
Power supply	5.4×10^{-5}
Power electronic controller	8.5×10^{-5}
Control signal	1.3×10^{-5}
DSP failure	1×10^{-5}
Total electronic failure	**1.5×10^{-4}**

To achieve this, we need redundancy and different control techniques.

My current topology is simply inadequate.

Fault Detection Algorithms

Park's Vector Approach

space vector trajectory diameter

Voltage-Based Techniques

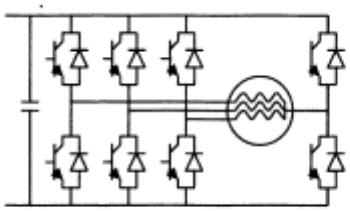

Figure 3: 3-phase Inverter with Neutral Leg

Only for short circuit protection, causes stress

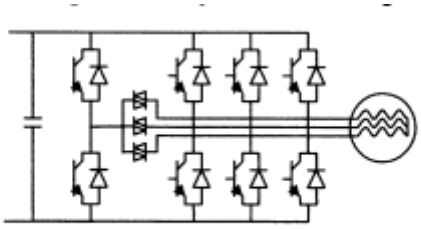

Figure 5: 3-phase Inverter with Redundant Leg