IDLE STATE (HVBP OFF, LVBP ON, SDC OPEN, Brakes ACTUATED, COMMS OFF)

COMMS ON

ACTIVE STATE

CONNECTED STATE
Connects to the Base Station and Trackside

SDC CLOSE

CHECK STATE
Checks if the following variables are within acceptable limits:
1. IMD insulation
2. Brake and LIM pressure
...

FAULT : Failed 3 times

STATIONARY PHASE FAILURE

Fault

Fault Handler - Waits For Reset

HVMS ON

HVBP ON

LEVITATION PRECHARGE

PROPULSION PRECHARGE

Takes longer than 2*expected time

SDC OPEN

SDC Acknowledgement

HV(+) ON

STATIONARY PHASE

DISCHARGE PHASE

SDC OPEN

Propulsion Discharge

DEMO STATE

MOVING PHASE

GUI RETRACT BRAKES

RETRACT FRICTION BRAKES

Proximity sensors confirm all 4 brakes retracted

Any of the EMS failed to power up

LEVITATION ON
All 4 HEMS and LEMS initialise

FAULT

Inverter unresponsive or failed to init

POD BOOSTER ON
Signal Inverter to output Constant DC

Send Start signal to track side controller

BOOSTING

POD LIM about to cross the booster length
Turn off constant DC

Pneumatic Pressure low or mechanical lock fail to open

LIM ADJUSTMENT
Move the LIMs closer inward to account for change in gap

INVERTER REINITIALISE
Signal Inverter to switch to PWM output

CRUISING

ABNORMAL GAP SENSOR READING → ROLLING

OVERHEATING → OPEN SDC

HANDLED BY PCU ONLY SENDS ERROR OVER CAN

LIM OVERHEATING → COASTING

OVERSPEEDING → OPEN SDC

STATIONARY PHASE FAILURE

RETRY STATE
Try thrice again

NO → DISCHARGE PHASE

MOVING PHASE FAILURE

RETRY STATE
Try thrice again

NO → STOPPING PHASE

COMMUNICATION FAILURE

ACTIVE STATE

MQTT FAILURE
Heartbeat not recieved

CAN FAILURE
Error frame observed / Heartbeat not recieved

WAIT FOR RECONNECTION ?

NO → STATIONARY PHASE FAILURE

DEMO STATE

OPEN SDC (EMERGENCY)

IMD / BMS FAILURES

INSULATION BELOW THRESHOLD

OPEN SDC (EMERGENCY)

BMS WARNING
Battery Overheating / Overcurrent / Overdischarge

STOPPING PHASE

Engage Friction Brakes

Levitation OFF

VELOCITY = 0

RETRACT FRICTION BRAKES

VELOCITY = 0

ENGAGE FRICTION BRAKES

Inverter fails to output Constant DC

DC BRAKING ON
Signal Inverter to output Constant DC

PROPULSION OFF
Signal Inverter to Stop PWM

FAULT → RAISE PNEUMATIC PRESSURE LOW FAULT

FAULT → OPEN SDC