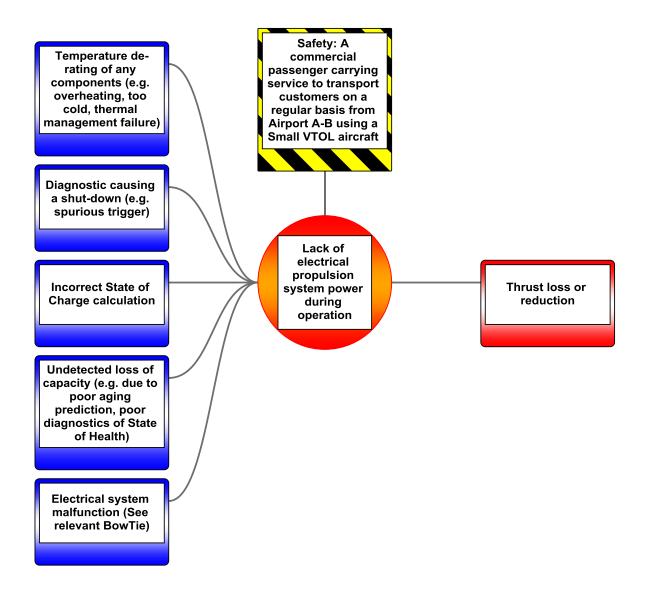


Sub-topic focus: Electrical system (including batteries)

High voltage electrical short (e.g. due to insulation damage, liquid ingress) High voltage electrical arcing (e.g. due to insufficient spacing, humid conditions) **Faulty component** (e.g. inverters, DC-DC, contactors) Safety: A commercial Physical damage passenger carrying (e.g. penetration of service to transport the battery case, customers on a vibration, abrasion, regular basis from Airport A-B using a previous uncontrolled Small VTOL aircraft shutdown) Battery internal short/ Battery Management System malfunction (e.g. Electrical High Voltage to Low system Voltage connection due to internal fluid Malfunction of malfunction critical flight occurs during leak or loose instruments/ operation component) automation/ flight controls **Battery loss of** thermal control (e.g. due to cooling circuit failure - leak or pump/controller failure) Incorrect installation or incorrect/ insufficient maintenance Power distribution unit failure (e.g. control unit malfunctions. contactors stuck) Pre-charge fault (e.g. due to control failure, stuck contactors) Electromagetic interference (e.g. due to electromagnetic coupling)



Incorrect battery storage (e.g. left at high state of charge, high temperatures)

Poor battery handling (e.g. accidental damage during transport)

Incorrect installation and/or maintenance (e.g. resulting in excessive vibrational loads)

Poor charging protocols (e.g. resulting in exessive temperatures, dendrite growth, aging effects)

Poor battery management and diagnostics in-flight (e.g. BMS, thermal management, State of Health, State of Charge)

Poor battery management and diagnostics preflight (e.g. pre-flight checks, State of Health estimation)

Operation outside of SOPs (e.g. in an emergency)

Battery not fit for purpose - (design certification) failure to fully anticipate the envelope

Battery not fit for purpose - (e.g. counterfeit parts) Safety: A commercial passenger carrying service to transport customers on a regular basis from Airport A-B using a Small VTOL aircraft

> Battery failure during operation

Explosion - direct (battery explosion), or secondary (e.g. pooling of gases)

Battery fire - thermal runaway, leading to local structural damage

Battery venting pilot incapacitation due to toxic gases, long term health effects of toxic gases

Battery leaking release of corrosive
and/or toxic
checmicals
compromising
structures and/or
health