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| **Functional Requirements – What functional capability must the Power Supply Trainer have** |
| **Serial** | **Requirement Description** | **MoSCoW[[1]](#footnote-1)** | **Comment** |
| **Alternating Current** |
| FN001 | PST should have the ability to fully emulate a modern twin engine aircraft AC system where Primary Power is three phase AC. Functions should include Generator control, load sharing, load shedding in the event of failure and system switching when Ground Power is brought on line. There is also a need to have a system which can provide the required DC secondary power through use of TRU’s. | Should Have |  |
| FN002 | System must be wired in such a way that we are able to introduce fault conditions, probably remotely through an instructor station computer, and should have sufficient “break in” points to allow students to logically carry out fault finding techniques. | Must Have |  |
| FN003 | Realistic start-up procedure to demonstrate: Battery supplied DC power, External / Ground supplied power, APU supplied power, Main AC generator supplied power (External and APU removed) | Must Have |  |
| FN004 | Emulation of power supplied from a Ram Air Turbine following generator failures. | Must Have |  |
| **Direct Current** |
| FN005 | PST should have the main DC functions available on a modern twin engine aircraft, these should include a Battery with its associated control circuits, a ground power system for both AC and DC ground power complete with safety interlocks, an engine starting system which closely emulates either a FADEC controlled or a Manually controlled start sequence. | Should Have  |  |
| FN006 | There should also be a comprehensive Centralised Warning System with display output and attention getter functions. | Should Have |  |
| FN007 | It should also be able to be switched to emulate a traditional DC primary powered aircraft with associated inverters to produce AC three phase. | Should Have |  |
| FN008 | It could have inclusion of additional systems such as internal/external lighting, fire detction and protection, canopy/door interlocks, etc. | Could Have |  |
| FN009 | It should also be able to be switched to emulate a modern 270V DC primary powered aircraft. | Should Have |  |
| **System Displays and Controls** |
| FN010 | The PST should mimic current aircraft display and control systems. | Should Have |  |
| FN011 | It must have a mix of Multi Functional Displays and modern push switch panels. | Must Have |  |
| FN012 | It should be able to emulate a CIETP scenario. | Should Have |  |
| FN013 | PST should have a volume controlled sound system to provide aural feedback to student during Ignition Testing and Engine Start. | Should Have |  |
| FN014 | It should have Attention Getters associated with the Centralised Warning system. | Should Have |  |
| FN015 | Should have the ability to demonstrate a system operation in real time or in step mode | Should Have |  |
| FN016 | Must be able to simulate a variety of faults including short circuit to ground, open circuit, high resistance, line-to line short and cross connection faults | Must Have |  |
| FN017 | Fault conditions must also include: Main AC generator failure, over / under voltage, over / under frequency, incorrect phase rotation, non-acceptance of external / ground power, component failure. | Must Have |  |
| FN018 | Should be able to demonstrate real and reactive load sharing | Must Have |  |
| **Wiring** |
| FN019 | Wiring should be similar to a modern aircraft utilising DSP 33 cables and each wire should be identified with a cable ident system which ties up with the supplied wiring diagrams (Topic 10) | Must Have |  |
| FN020 | Appropriate 3 phase cabling should be used in the AC system. | Must Have |  |
| **Connectors** |
| FN021 | The PST must include a range of standard plugs and socket connectors such as the 602 series or its replacement and Ward Brook terminal blocks used in modern aircraft | Must Have |  |
| FN022 | The PST must have a series of AC and DC standard connectors used in aircraft | Must Have |  |
| **Electrical Components** |
| FN023 | Students must have access to Leech style relays and mountings, which can be used as break in points during fault finding. | Must Have |  |
| FN024 | Other electrical components must be shape models with the correct electrical connections | Must Have |  |
| **Electronic Components** |
| FN025 | Standard test equipment or a computer driven modified version to suit use with PST | Must Have |  |
| **Supporting Software – (e-Learning)** |
| FN026 | Ability to access a Virtual Learning Environment version of any PST incorporating a software program to allow off line use by individual students | Should Have |  |

1. Must Have, Should Have, Could Have, Will Not Have [↑](#footnote-ref-1)