

EXHIBIT A

Interest to Provide Services

Simulation's interest is to sustainably design and manufacture a state-of-the-art Narrow-Body Multipurpose Aircraft Rescue Firefighting Facility (ARFF) Fire Training Simulator for Denver International Airport that will provide world-class training opportunity for many years to come.

Understanding of Design Specifications

Simulation will supply an ARFF simulator that provides a safe training environment that is also visually and physically realistic, repeatable, and able to be documented. Optimal training will be achieved through a balance of realism and safety.

The work includes design, fabrication, inspections, delivery, installation, testing and commissioning of the facility. The design will include internal, external, and fuel spill/burn pit fire scenarios that can be utilized in any weather conditions at the Denver International Airport Fire Training Ground.

In order to accommodate the new aircraft simulator, the existing aircraft will be removed under a separate contract and the fire-ground infrastructure and primary utilities will be modified to accept the new simulator by a DEN Civil/Infrastructure Contractor. Responsibilities for each element of work have been set out in our Workshare Responsibility Matrix included in this proposal (Tab 9).

The new aircraft simulator will be designed to represent a modern narrow-bodied aircraft that combines the features of an Airbus A320, Boeing 737, De Havilland DHC 8, and a Bombardier CRJ 900. The simulator will be constructed of material, such as weathered steel, that will be resistant to atmospheric conditions and high heat generated by propane fueled fires, both interior and exterior.

The simulator will have 4 engines - two with capabilities for replicating an A320/B737 (one of which has operating cowlings with an interior propane vapor fire while the other is to have a larger hotter exterior and interior liquid propane fireplace), one replicating a turboprop engine mounted on the starboard (right) wing similar to that found on a De Havilland DHC 8, and one turbofan engine replicating that found at the rear of a bombardier CRJ900.

Fuselage dimensions will be approximately 13' 1-1/2" W x 98.5' L. with an approximate wing span of 63' and an aircraft compartment floor height of 11'5". The interior of the mock-up will incorporate various interior components such as bulkheads, seats, stairs, luggage racks, galleys, etc. typically found in an aircraft.

The chart on the following page identifies the fire features included in our simulator.

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Fire Location	Type of Fire	Fuel	Fireplace Intensity Levels		
			Variable	3 Stages	
DHC 8 Starboard Engine	Combustion Chamber	LPG Liquid	Variable	3 Stages	
DHC 8 Starboard Engine	Exhaust	LPG Liquid	Variable	3 Stages	
DHC 8 Starboard Undercarriage	Wheel Brake	LPG Liquid	Variable	3 Stages	
Starboard Side	Fuselage Fire	LPG Liquid	Variable	3 Stages	
CRJ 900 Starboard Engine	Engine Fire	LPG Liquid	Variable	3 Stages	
APU	Smoke	NA	NA		
Port Side	Fuselage Fire	LPG Liquid	Variable	3 Stages	
A320 Undercarriage	Wheel - Smoke	NA	NA		
A320 Undercarriage	Wheel Brake	LPG Liquid	Variable	3 Stages	
A320 Undercarriage	Oleo Leg	LPG Liquid	Variable	3 Stages	
A320 Port engine	Combustion Chamber	LPG Liquid	Variable	3 Stages	
A320 Port engine	Exhaust	LPG Liquid	Variable	3 Stages	
Port Wing	Split Wing	LPG Liquid	Variable	3 Stages	
Port Wing	Underwing	LPG Liquid	Variable	3 Stages	
A320 2nd Engine	Full Accessory Section/Hatch	LPG Vapor	Single		
Fuel Spill Burn Pit	Starboard Engine - Forward Zone 1	LPG Liquid	Variable	3 Stages	54 sq. ft.
Fuel Spill Burn Pit	Starboard Engine - Forward Zone 2	LPG Liquid	Variable	3 Stages	54 sq. ft.
Fuel Spill Burn Pit	Starboard Engine - Forward Zone 3	LPG Liquid	Variable	3 Stages	54 sq. ft.
Fuel Spill Burn Pit	Starboard Engine - Forward Zone 4	LPG Liquid	Variable	3 Stages	54 sq. ft.
Fuel Spill Burn Pit	Starboard Engine - Forward Zone 5	LPG Liquid	Variable	3 Stages	54 sq. ft.
Fuel Spill Burn Pit	Starboard Engine - Forward Zone 6	LPG Liquid	Variable	3 Stages	54 sq. ft.
Fuel Spill Burn Pit	Starboard Engine - Forward Zone 7	LPG Liquid	Variable	3 Stages	54 sq. ft.
Fuel Spill Burn Pit	Starboard Engine - Forward Zone 8	LPG Liquid	Variable	3 Stages	54 sq. ft.
Fuel Spill Burn Pit	Starboard Fuselage - Rear Zone 1	LPG Liquid	Variable	3 Stages	65 sq. ft.
Fuel Spill Burn Pit	Starboard Fuselage - Rear Zone 2	LPG Liquid	Variable	3 Stages	65 sq. ft.
Fuel Spill Burn Pit	Starboard Fuselage - Rear Zone 3	LPG Liquid	Variable	3 Stages	65 sq. ft.
Fuel Spill Burn Pit	Starboard Fuselage - Rear Zone 4	LPG Liquid	Variable	3 Stages	65 sq. ft.
Fuel Spill Burn Pit	Port Fuselage - Front Zone 1	LPG Liquid	Variable	3 Stages	135 sq. ft.
Fuel Spill Burn Pit	Port Fuselage - Front Zone 2	LPG Liquid	Variable	3 Stages	135 sq. ft.
Fuel Spill Burn Pit	Port Fuselage - Front Zone 3	LPG Liquid	Variable	3 Stages	135 sq. ft.
Fuel Spill Burn Pit	Port Fuselage - Front Zone 4	LPG Liquid	Variable	3 Stages	135 sq. ft.
Fuel Spill Burn Pit	Port Fuselage - Front Zone 5	LPG Liquid	Variable	3 Stages	135 sq. ft.
Fuel Spill Burn Pit	Port Under wing	LPG Liquid	Variable	3 Stages	108 sq. ft.
Fuel Spill Burn Pit	Port Fuselage - Rear Zone 1	LPG Liquid	Variable	3 Stages	65 sq. ft.
Fuel Spill Burn Pit	Port Fuselage - Rear Zone 2	LPG Liquid	Variable	3 Stages	65 sq. ft.
Fuel Spill Burn Pit	Port Fuselage - Rear Zone 3	LPG Liquid	Variable	3 Stages	65 sq. ft.
Fuel Spill Burn Pit	Port Fuselage - Rear Zone 4	LPG Liquid	Variable	3 Stages	65 sq. ft.
Internal Fire	Flight Deck Control Console	LPG Vapor	Single		
Internal Fire	Flight Deck Overhead Controls	LPG Vapor	Single		
Internal Fire	Galley	LPG Vapor	Single		
Internal Fire	Ceiling Rollover Fire	LPG Vapor	Single		
Internal Fire	Seat Fire	LPG Vapor	Variable	3 Stages	
Internal Fire	WC Fire	LPG Vapor	Single		
Internal Fire	ULD Fire	LPG Vapor	Single		

Understanding of Doors and Access Panels

All cargo doors, main deck doors, and access panels/doors will at minimum replicate those of either a Boeing 737 or an Airbus A-320 aircraft in size, location, and operation will meet the requirements listed below:

- R-1 Door (Forward Starboard Side Door) will closely represent the opening and closing movement and operation mechanism representative of the actual door on a Boeing 737 aircraft. This door will be 6'-0" high and 2'-10" in width.
- L-1 Door (Forward Port Side Door) will closely represent the opening and closing movement and operation mechanism representative of the actual door on an Airbus A-320 aircraft. This door will be 6'-1" high and 2'-11½" wide.
- R-2 Door (Rear Starboard Side Door) will closely represent the opening and closing movement and operation mechanism representative of the actual door on a Boeing 737 aircraft. This door will be 6'-0" high and 2'-10" wide.
- L-2 Door (Rear Port Side Door) will closely represent the opening and closing movement and operation mechanism representative of the actual door on an Airbus A320 aircraft. This door will be 6'-1" high and 2'-11½" wide.
- Self-closing safety gates on the four passenger doors will be provided. In the event that a door is opened, a visible and audible alarm will be activated inside the cabin and the wireless instructors pendants will indicate on the main control desk in the control room which door has been opened.
- Provisions will be made in the design of the simulator that allows for the access of an "Air Stair vehicle" to one of the passenger doors.
- On the port side of the aircraft, there will be two emergency over-wing exits onto the wing. One of these doors will replicate an "open and throw out" design as seen on an A320 (3'-4" high x 1'-7¾" wide) while the other door opens "up and over" replicating the B737 over-wing exit design (3'-2" high x 1'-8" wide).
- There will be an exterior access hatch to the avionics bay 1'-11¾" x 1'-7¾" in size situated on the underside of the nose cone giving access into the lower crawl level of the simulator from the front.
- There will be two internal floor hatches (one forward and one rear) to allow access from the main passenger cabin into the cargo area.
- On the starboard side of the aircraft at the rear, there will be a double leaf door with simple manual hinge construction to allow for egress/ingress to the aircraft.
- On the starboard side rear of the aircraft, there will be a fully operational, hydraulically operated cargo door that replicates an Airbus A-320 cargo door 5'-1 ¾" wide x 4'-¾" high that allows access into the cargo area of the aircraft.

- On the port side rear of the aircraft, there will be a fully operational hydraulic cargo door for entry into the rear main cargo deck of the aircraft, where a unit load device (ULD) will be positioned at passenger cabin level, door dimensions to be 5'-1 $\frac{3}{4}$ " wide x 6'-3/4" high.
- All hydraulic doors will be designed to be operated from both inside and outside the aircraft with operating controls in line with the model of aircraft the door represents.
- There will be two towable purpose-built portable steel staircases with platforms to allow access to the passenger doors provided with the simulator.

Understanding of Interior Features

The interior features of the ARFF simulator will be as follows:

- The aircraft compartment will feature a flight deck cockpit section 6'-0" in length with an approximate floor area of 55 square feet complete with center console and instrument panel (including fire and smoke scenarios), overhead panel (including fire and smoke scenarios), two seats, and a door to the main passenger compartment. The nose cone of the fuselage will be 3'-4" long from the front of the simulator fuselage to the flight deck and will have a bulkhead to separate it from the cockpit area. This section will contain the air inlet grilles for the fuselage ventilation system.
- There will be a partition bulkhead between the flight deck and the forward section of the aircraft cabin giving this section a floor area of approximately 52 square feet. There will be a distance of 4'-0" from this bulkhead to the rear of the flight deck partition. The bulkhead will be designed to allow for movement of smoke and operation of the extraction systems.
- The aircraft forward passenger compartment will have a forward galley area (complete with fire and smoke scenarios) and lavatory. This section will be 4'-0" long with a floor area of approximately 52 square feet.
- There will be a 1-2-1 seating arrangement, twin aisle, in the forward section of the passenger cabin and this will be a minimum of 5 rows of seats. This area will be 20'-0" long from the flight deck bulkhead to the rear of the center toilet wall with a floor area of approximately 260 square feet. The seat dimensions for the 1-2-1 seating arrangement will be double seats complete width of 3'-6" with the single seat width 1'-10". The pitch of these seats will be 2'-8".
- There will be a center lavatory between the forward seating area of the passenger compartment and the rear seating area of the passenger compartment.
- There will be a 3-3 seating arrangement, single aisle, in the rear section of the passenger compartment that will include a minimum of 12 rows of seats. Each set of 3 seats will be 5'-1 $\frac{3}{4}$ " wide. The 3-3 seating section will be 36'-6" long from the rear of the center toilet wall to the front of the rear cargo bulkhead, providing a floor area of approximately 475 square feet in the rear passenger section.
- The starboard side seats in the 3-3 seating section will house a seat fire scenario. There will also be a ceiling rollover fireplace installed in the cabin or the fuselage.

- The 3-3 seating area will include overhead lockers. Due to the rollover fire scenario in this section, only half of the overhead lockers must be openable.
- At the rear of the aircraft compartment, there will be a lavatory (with waste bin fire scenario), a bulkhead partition, and an open area with an ULD device (including a fire scenario). The passenger deck cargo area will be 12'-6" long from the back of the rear passenger area bulkhead to the front of the plant/control room bulkhead giving a floor area of approximately 163 square feet.
- At the rear of the fuselage, there will be a bulkhead, which leads to the rear electrical control and plant room, including storage for the internal Wi-Fi pendant charging stations, industrial Wi-Fi receiver, and any other equipment necessary for the operation of the simulator. This room will be 6'-0" long from the rear of the passenger deck cargo area bulkhead to the rear of the simulator fuselage giving a floor area of approximately 78 square feet.
- The internal floor will be constructed using an open grid/mesh flooring with solid flooring being installed in the aisles.
- 2 oil based, nitrogen charged, smoke machines will be provided for the passenger compartment. Each machine will be oil based for a temperature layering resistant smoke. A nitrogen carrier gas will be supplied to each smoke machine location. Each machine will have low fluid indication to notify the operator of low fluid levels. Each machine will have a smoke distribution fan attached to the unit to allow good distribution of smoke. Each machine will have an operational temperature indication. The machines will warm up once the simulator is in operation. A pressure switch will be fitted to the nitrogen system to indicate low pressure and inhibit the use of the smoke machines.

Understanding of Exterior Features

The exterior features of the ARFF simulator will be as follows:

- The port side wing will have capabilities for two turbofan engine fires that replicate in size and shape those found on an Airbus A-320 or Boeing 737 aircraft. The inboard engine fire will be fueled by liquid propane and be of varying intensity. The second port side engine will be positioned on the outside of the main engine. This engine will have an internal accessory feature, a full-size "lift-up" lightweight aluminum panel (cowling) and an internal LPG vapor single intensity fire scenario.
- The port side wing will have an undercarriage that replicates one found on the Airbus A-320 or Boeing 737. This undercarriage will have both smoke and fire capabilities included.
- On the starboard side of the aircraft, the turboprop engine and undercarriage assembly will replicate that of a high-winged aircraft such as the De Havilland DHC-8. Both the engine and undercarriage will have both smoke and fire capabilities included.
- On the starboard side rear of the fuselage, there will be a turbofan engine that replicates an engine found on a CRJ-900 aircraft. This engine will have both smoke and fire capabilities included.

- There will be an on-board Auxiliary Power Unit (APU) installed and equipped with a smoke generator.
- 1 oil based/nitrogen charged smoke machine will be provided for the undercarriage and 1 oil based/nitrogen charged smoke machine will be provided for the APU.
- HRET piercing panels/areas will be provided on the simulator - 2 on the port side and 2 on the starboard side. The design will allow for easy and quick change of light aluminum replacement panels.
- Capabilities for multiple exterior fuel spill fires fueled by liquid propane will be installed around the simulator with sizes and locations identified in the table located earlier in this document.
- All fuel spill fire areas will be constructed with a recessed design allowing both fire fighting vehicles and persons to drive and walk across them.
- All fuel spill fires will have multiple pilot lights to ensure lighting of main flame in differing wind conditions.
- The fuel spill fires will be designed for year-round use and will be a 'dry design' (not water filled).
- We will submit a brief technical specification for the design of these fuel spill fireplaces.
- As noted in the chart identified in the "Specifications" section of this document, there are three specific dimensional sizes for the exterior fuel spill fireplaces. Each of these sizes will have the following requirements for BTU's per hour:
 - Area 54 sq. ft. Fire size – 150,000 BTU/Hr. as per the addendum
 - Area 65 sq. ft. Fire size – 180,000 BTU/Hr. as per the addendum
 - Area 135 sq. ft. Fire Size – 360,000 BTU/Hr. as per the addendum
- The combined square footage of the fuel spill fireplaces will be a minimum of 1700 sq. ft.

Understanding of Safety Systems

The safety systems of the ARFF simulator will be as follows:

- Gas monitoring will be provided. The gas monitors used will incorporate Infra-red technology and will be self-calibrating and self-diagnosing allowing a Safety Level 2 system to be created.
- The gas monitoring system will provide an audible alarm at 10% LEL of propane and shutdown of fires and start of extraction fans at 20% LEL of propane. It will also create a safe environment by disabling any fires and extracting any smoke and heat along with excess gas.
- Gas monitoring will be logged and able to be downloaded to a USB storage device.

- Internal temperature monitoring will be provided. These will be K-type and will run from sensing the tip to the panel as a mineral insulated cable.
- The internal temperature monitoring system will provide an audible alarm once the temperature set point has been reached. It will also create a safe environment by disabling fire scenarios, enabling lighting at 100% of the simulator's capabilities and extracting any smoke and heat from the simulator.
- Two thermocouples will be provided in each sensing location, one at ceiling level and one 1.5m from floor level.
- Temperature monitoring will be logged and able to be downloaded to a USB storage device.
- All ignition burners will be pre-mixed gas/air automatic high tension (HT) spark ignition with flame ionization monitoring.
- An internal lighting system will be installed that allows a 0% / 25% / 50% / 75% / 100% level of control. The lighting utilized will be LED floodlights installed at a low level in the simulator within protective cages. In the event of an emergency, a separate power supply will be used and a hard-wired switch to bring the lighting on at full brightness will be installed in the simulator.
- All equipment rooms will have separately fed and locally switched fluorescent lighting systems in them.
- A mechanical extraction system will be provided that will extract all smoke, heat and gasses from the simulator within 45 seconds of activation. Mechanical extraction will be designed on 80 air changes per hour and smoke clearance within 45 seconds, which will shut off the fuel leading to all fire props immediately upon activation.
- Internal exercise stop (E-Stop) buttons will be provided, which will shut off the fuel leading to all fire props immediately upon activation.
- 2 wireless touch screen human machine interface (HMI) control pendants will be provided to control internal fires, lighting, smoke, extraction, and emergency shutdown. Push button pendants can also be provided and this decision will be made with the customer during the preliminary design phase. There will no financial impact to our offer based on the customer's preference regarding internal pendants.
- A central control room operator panel will be provided with two HMI touch screen control interfaces. The central control panel will have:
 - A safety system health indication and trip reset button
 - A two-position rotary key switch
 - An emergency stop
 - Input/output pressure gauges
 - HMI touch screens

- The control panel will have a remote diagnostic facility to allow for remote access over the internet for technical support to operators.
- A wireless 'Deadman' button, a device that when the users finger is removed from a plunger the simulators gas flow shuts off, will be provided for the control of external fires.
- All fire scenarios will have full electronic ignition and lit flame supervision.
- The simulator will have audible and visual alarms for fault/emergency situations and for 'simulator in use'.
- All vapor controls will use dual solenoid (redundancy) controls.
- All pneumatic controls will have dual solenoid (redundancy) controls.
- All pneumatic liquid propane gas (LPG) actuators will have dual valve fail to close (redundancy) controls.

Approach

In our many years of experience, the most effective approach to management begins with a solid foundation of communication and cooperation with the customer. We leverage technology to efficiently and effectively manage the project in a sustainable way that minimizes waste. Our proven expertise and strong commitment to providing a quality product can be seen in our innovative features and attention to detail.

Using our BS EN ISO 9001: 2008 Quality Management System, we will complete the work in accordance with requirements of the B.4 Project Schedule of the Denver International RFP. Our schedule accommodates two x 2 week factory shutdowns for the Christmas and New Year vacations in 2017 and 2018.

Plan for Implementing and Monitoring the Services

We generally use the process depicted on page 10 of this Tab, along with customer input, to successfully implement and monitor the services.

Strategies, Tools, & Safeguards for Timely/Quality Performance

As previously mentioned, our Quality Management System has gained BS EN ISO 9001: 2008 certification, including aspects specific to the design, manufacture and installation of fire training equipment.

Our commitment to the continuous improvement of our processes and products is the reason that we have been able to design, manufacture, install, and maintain over 45 aircraft simulator projects around the world over the past number of years.

Effective communication is an important tool to safeguard timely and quality performance. We will ensure that customer needs and expectations are understood. Throughout our organization, we will communicate these needs and expectations, as well as relevant statutory and regulatory requirements. Using that information, we will establish objectives specific to the project; ensure the availability of resources; and craft a Quality Policy according to our Quality Management

System. Throughout the project, our Quality Policy includes means of monitoring, measuring, and communicating the status of the job as compared to the project schedule.

Equipment, Software, and Hardware Considerations

Our design will incorporate the latest equipment, software, and hardware that is available at the time of the build. This includes, but is not limited to, internet-based remote diagnostics, robust wireless handheld pendant controls, realistic opening mechanisms and features, HMI touch screen operator panels, and maintenance-friendly hydraulic cargo doors.

For more information, please see Tab 10 – Build Processes, Features, & Designs That Set Simulation Apart.

Training and On-Going Support

Simulation will provide Operator Training for 30 persons divided into two groups of 15. Each person will receive 16 hours of operator training split evenly between classroom and practical instruction.

Simulation will provide the operator training manual in both electronic (PowerPoint) and hard copy formats. Technical support will be provided via our office in Pittsburgh as well as via internet-based remote assistance. Phone and online technical support will be available during normal working hours Monday to Friday.

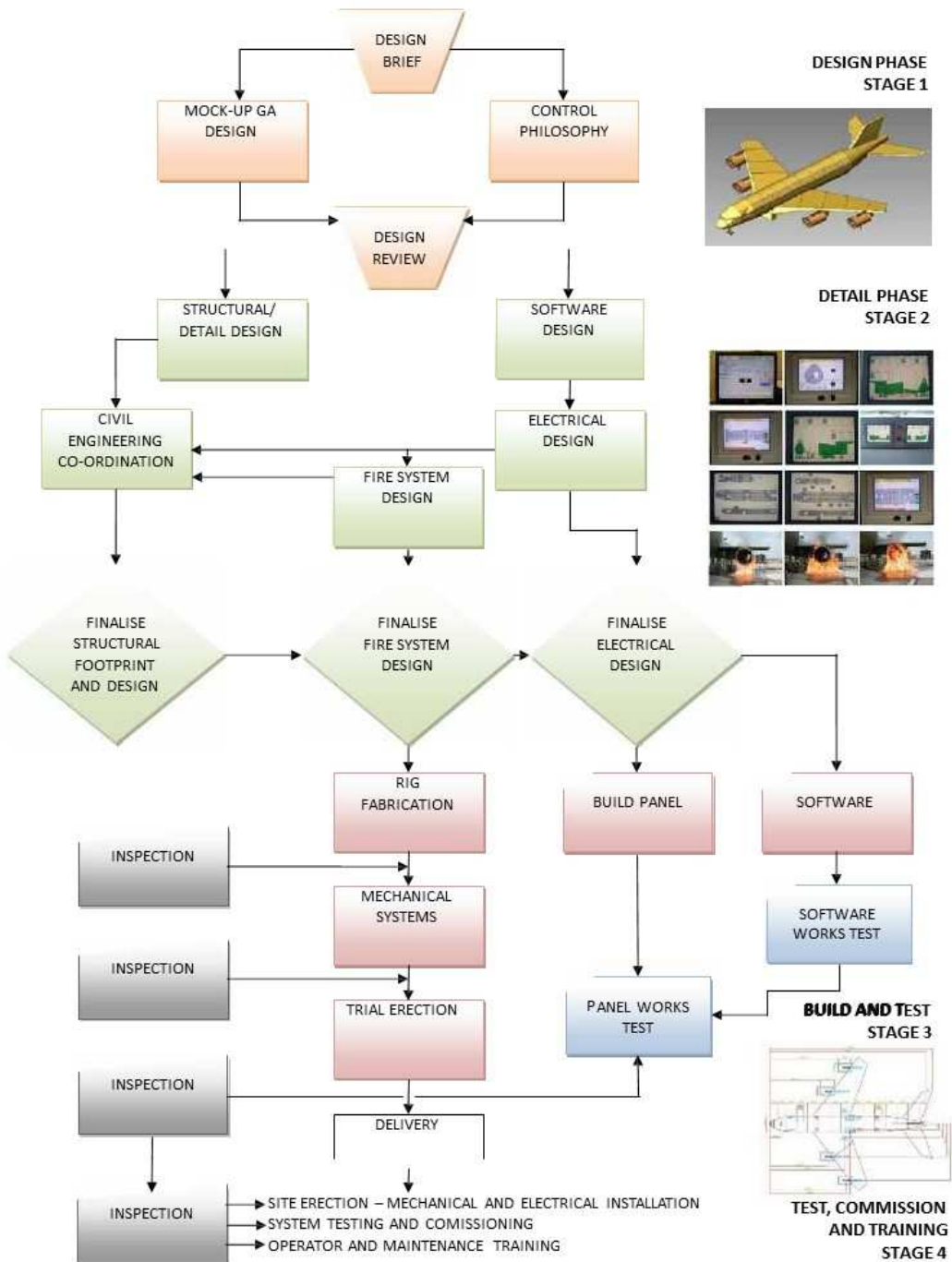
Additional on-site support will be provided during the 24 month warranty period. Our technician will visit the site at 3-month intervals to carry out a planned maintenance inspection of the simulator. We have included up to 8 emergency call outs during the 24 month period each of which will allow for 2 persons on site for one full working day.

We have included a 10-year maintenance contract which would commence on expiration of the 24-month warranty period. Please see Tab 7 for more details.

Subcontractors

Simulation will review the qualifications of any and all subcontractors. We will also ensure compliance with all applicable rules, regulations, ordinances, and laws governing equal employment opportunity, affirmative action programs, and SBE, M/WBE, or DBE requirements.

**METHODOLOGY FOR THE DESIGN AND BUILD PROCESS FOR THE AIRCRAFT
 FIRE TRAINING SIMULATOR**



Tab 7 – Short Term Warranty and Long-Term Maintenance

Short-Term Warranty

In accordance with Section D.8 of RFP 28496, Simulation warrants and guarantees to City that all goods furnished will be free from defects in workmanship and materials, will be merchantable, and fit for the purposes for which they will be used.

Our offer includes a 24-month warranty period, Phase 2C, on all parts and labor.

The warranty is contingent upon the following:

- The fire training facility being operated in accordance with the operator manual and training instruction provided at the time of handover
- The fire training simulator maintenance period commences immediately following the date of handover

Short-Term Maintenance

Per Phase 2C of the contract, Simulation's offer includes a two-year warranty/maintenance period. Included will be:

- 4 standard service visits per year (8 in total over 2 years)
- Up to 4 emergency call-outs per year consisting of one full day on site with two people (8 in total over 2 years)

Long-Term Maintenance

Per Phase 3, a separate ten-year contract will cover long-term maintenance and will commence immediately after Phase 2C. Included will be:

- 4 standard service visits per year (40 in total over 10 years)
- Up to 4 emergency call-outs per year consisting of one full day on site with two people (40 in total over 10 years)

For pricing of the long-term maintenance plan, please see Appendix B – Price Schedule.

Spare Parts

Any part failure during the 24-month warranty period will be replaced free of charge.

During the long-term maintenance period, favorable pricing on spare parts will be charged in addition to the maintenance costs on the basis of prior approval before ordering parts. Volume discounts as well as discounted payment terms will be open to negotiation.

For any goods furnished during the long-term maintenance period which become defective within twelve (12) months after date of receipt by City, Simulation will either, at City's election and to City's satisfaction, remedy any and all defects or replace the defective goods at no expense to City. Simulation will be fully responsible for any and all warranty work, regardless of third party warranty coverage.

Summary of our short and long term maintenance strategy included in our proposal

		Planned Maintenance	Emergency Call-Outs	Spare Parts	Consumables (i.e. Smoke Fluid)
Warranty Period	Year 1	Yes	Yes	Yes	No
Warranty Period	Year 2	Yes	Yes	Yes	No
Maintenance Period	Year 3	Yes	Yes	No	No
Maintenance Period	Year 4	Yes	Yes	No	No
Maintenance Period	Year 5	Yes	Yes	No	No
Maintenance Period	Year 6	Yes	Yes	No	No
Maintenance Period	Year 7	Yes	Yes	No	No
Maintenance Period	Year 8	Yes	Yes	No	No
Maintenance Period	Year 9	Yes	Yes	No	No
Maintenance Period	Year 10	Yes	Yes	No	No
Maintenance Period	Year 11	Yes	Yes	No	No
Maintenance Period	Year 12	Yes	Yes	No	No

Tab 8 - Meeting the Time Line: Specific Aspects on Meeting the Schedule

Section B.4 of the RFP presents a “Project Phase Completion Schedule” that breaks down the different phases of the project. In the following report, each specific area will be addressed as to how Simulation will accomplish the phases in a manner that will keep the project on its time schedule. See the Gantt chart on the last page of this Tab 8 in order to see a visualization of the project.

Phase I, Design:

A. Phase 1A - Project kick-off and field evaluations: Completion duration 30 days after PO

Immediately upon receipt of the purchase order, an internal kick-off meeting occurs through the project manager. It is finalized and cemented as to who the key players will be and what roles they will take (See Tab 6.). It is also determined which of the key players will be attending the kick-off meeting and the field evaluations and the schedule is set with the City of Denver for a date to attend site. Critical aspects of the project will be agreed including scope of work and take-over points, as well as responsibilities of the members of the Simulation and Denver teams. A full report is compiled for our internal use following the attendance of the kick off meeting and performance of the field evaluation. A separate report is compiled by the project manager for the City of Denver’s project and engineering team assigned to the project which will include a checklist of open items and questions that need to be answered before proceeding with Phase 1B. Denver’s goal is to have this review completed within 7 calendar days and report it back to Simulation project manager.

B. Phase 1B - Preliminary design - General arrangement, Preliminary structural loads: Completion duration 30 Calendar days after approval of Phase 1A.

Immediately upon receipt and agreement of comments and answers from Denver, multiple departments within Simulation commence work to meet this deadline. The project manager will develop a task list for the managers of the design, engineering, process engineering, production, and compliance departments. All details will be analyzed and the design and engineering department will convert the concept/design from the proposal into a preliminary design. This design phase will yield accurate dimensions and requirements so that the loads and spaces and civil work can be analyzed, adjusted, and then confirmed by Denver’s project team. During this phase significant communication will occur between Denver and Simulation (including possible additional site visits) so that the preliminary design is as close to being what both parties require as possible, thus saving time so that detail work can begin. Denver’s goal is to have a stamp of approval on the preliminary design within 7 calendar days

C. Phase 1C - Design, Final design documents: Completion duration 45 days after approval of Phase B1.

Immediately upon approval of the preliminary design the engineering and design departments begin the detail design work to turn the preliminary design into final design. During this phase, it is still possible for some minor changes or additions to be made by

Denver as long as there is not an impact to costing or significant extra design work (this could potentially add cost and delivery time). Significant communication continues with both parties to ensure that the progress is according to plan so that no unexpected items of significance emerge during the approval process. The project manager and chief design engineers will review the final design and then submit it to Denver. Release to purchasing for critical time sensitive components is given as well as approval for fabrication subcontractors to order the steel structural materials for the project. As a part of this final design, detail design drawings will also be created that are intended solely for the fabrication and machine shops and are proprietary. Note, in order to meet the timeline and speed up the process, very little of the automation, control, electrical design work for the simulator itself will be done (that will occur in the next phase). All basic design information that was agreed that Simulation would supply in the kick-off meeting for the civil engineering work and Denver subcontractors will be submitted. Denver's goal is to have this final design phase approved within 14 calendar days.

Phase II, Construction:

- A. Phase 2A - Fabrication & Mobilization: Completion 232 calendar days after approval of Phase 1C

Immediately upon approval, the fabricator for the aircraft simulator body, and structural components thereof, is given the approval to commence the fabrication with the steel purchased during Phase I. The automation, control, and electrical design departments commence work on the detail design and layout of the software program and the control cabinets. The gas control devices, safety systems, burners, and all other applicable parts are ordered immediately. During this time Simulation will also coordinate with Denver and be on site regularly to be the liaison for the civil contractors and sub-contractors completing the civil works, and supply infrastructure required by their scope of the project. Pre-inspection and quality control measures will be initiated BEFORE shipping to site so that checks for fit and correct function can be made. Project members from Denver will be invited to these quality control and progress checks to witness workmanship and functionality. In addition, preparations will be made to be prepared for the delivery of the components (i.e. space requirements, lifting equipment, subcontractor duties, etc.). It is the responsibility of the project manager and project management team to coordinate the timing of the different aspects of the job. The theory of "Just-in-Time" is loosely used to bring everything together at the critical point to make sure everything is delivered on site on time. As a part of this process, a supervisory team of experts will be mobilized and sent to site in coordination with the arrival of the simulator.

- B. Phase 2B - Assembly/Installation; Start-up/Testing/Punch List and Training: Completion 90 calendar days after completion of Phase 2A

The Phase 2A cross blends into phase 2B as the project manager and supervisory/commissioning team is on site to coordinate the assembly and locating of all components of the project. The large aircraft structure will be placed on the foundations and assembled in pieces from the truckloads arriving from the fabricator. Coordination between welders, fitters, and electricians will be made. The Simulation control and automation experts will supervise installation of the cabinets and electrical equipment and all control

devices for the system. Tests will be initiated to see that all connections are made and safety requirements followed. This is the start of the commissioning process whereby a set of procedures is followed to bring the system up to operating condition in a predefined order to avoid damage, to maintain a safe environment, and ensure a speedy process. The commissioning engineers will test all mechanical and functional systems and bring them on line while the control engineers test the automation systems and bring the control side on line. Once the individual systems have been thoroughly checked for function and operation, a predefined series of tests and run-throughs begin, making sure that every function required of the simulator is operating as prescribed. Once these tests are thoroughly completed and Denver's punch list items are resolved, Denver will sign final acceptance and training will commence. The training will include all aspects, including normal operation, various scenarios, trouble shooting, emergency scenarios, basic maintenance requirements, and advanced functionality. Once the training is complete, Denver will assume responsibility for the operational control of the simulator.

C. Phase 2C - Warranty/Maintenance Period: Completion 24 months following Final Acceptance

Following the final acceptance, the team of technicians based in Pittsburgh, PA will take over the responsibility for the pre-prescribed maintenance schedule. This team includes trained mechanical technicians, gas control experts, and automation experts. The benefit of Simulation being a part of the Alpine Metal Tech group is that our service and support staff is large because we service many customers throughout the USA, which has enabled us to cross train many experts in the maintenance and support of aircraft fire simulators. Coordination will be made with the airport fire department to arrange scheduled visits and a service call out system will be established in the case of an unforeseen problem. In addition, phone support and online support will be made available as many issues can be rectified over the internet with our access to the simulator via online troubleshooting and diagnosis. The design and engineering teams who built the simulator will always be available to provide secondary levels of support for any issues that are of a complex nature. Details on the warranty and maintenance are outlined in Section 7.

Phase III, Maintenance Period: Completion 10 years after Phase 2C ends

The maintenance period is just a continuation of services provided in the 24 month maintenance session, the details of which are outlined in Section 7. The same support staff that supported Denver during the 24 month warranty period, either in Pittsburgh or internationally, will continue to offer world class service and support.

Project Schedule, Start Date and Delays

Please see Gantt chart on the following page for the visual outline of the project schedule. The start date of the project is purely an estimation and will be actually set based on the issuance of the purchase order by the City of Denver. In addition, delays or time extensions caused by the City of Denver or any of its subcontractors or factors out of the control of Simulation, will be added to the overall delivery time. In all events, all parties will strive for on time, on budget completion of the project.

DENVER INTERNATIONAL AIRPORT , COLRADO , USA			30th June 2017	
WORKSHARE RESPONSILIBITY MATIX Issue Rev 001			Denver Airport or	
SUMMARY OF THE PRIMARY SCOPE OF WORKS			their appointed	Simulation
			general contractor	
A		Site Location	✓	
B		Main Utility Services - Availability at the Simulator Training Area	✓	
C		Planning Approvals	✓	
D		Master Planning	✓	
E		All infrastructure outside of the Training Area	✓	
F		Co-ordination of Simulation Specialist and Civil Engineering Contractor		✓
G		Responsibility for Management of Simulation		✓
H		Responsibility for Management of Civil Engineering Contractor	✓	
I		Any Electrical/Control Interface with any other Airport Management Systems	✓	
K		Approval of Simulator General Arrangement Drawings	✓	
L		Inspection of Simulator System - Stage 1 - Offsite	✓	
M		Inspection of Simulator System - Stage 2 - Offsite	✓	
N		Translation of any docs	NOT APPLICABLE	NOT APPLICABLE
O		Temporary Site Accommodation of Construction Staff	✓	
P		Planning Permission	✓	
Q		Environmental Approvals	✓	
U		Provision of 12 month multi-entry visas for all Simulation staff		✓
R		Simulation approved to all of its own components and vendor approval not required by client		✓
1	Simulator			
1.1	Structure			
	1.1.1	General Arrangement Layout and Design		✓
	1.1.2	Structural Calculations		✓
	1.1.3	Site Footprint and Loads		✓
	1.1.4	Detailed Fabrication Drawings		✓
	1.1.5	Overall Weight Estimation		✓
	1.1.6	Overall Material Listing		✓
	1.1.7	Material Purchase		✓
	1.1.8	Steelwork Fabrication		✓
	1.1.9	Steelwork part trial assembly		✓
	1.1.10	Steelwork painting		✓
	1.1.11	Steelwork delivery		✓
	1.1.12	Supervision of Fabrication		✓
1.2	Systems - Control, Safety and Fire			
	1.2.1	Control System Software - Safety		✓
	1.2.2	Control System Software - Fire Scenarios		✓
	1.2.3	Control Panel		✓
	1.2.4	Control Distribution Centres		✓
	1.2.5	Main Flame External Fire Scenario Pipework on the Simulator		✓
	1.2.6	Pilot Flame External Fire Scenario Pipework on the Simulator		✓
	1.2.7	External Fire Scenario LPG Vapour Pilot Ignition System with handheld lighting lance		✓
	1.2.8	Water Cooling System Design		✓
	1.2.9	Water Cooling Pipework		✓
	1.2.10	Main Flame Internal Fire Scenario Pipework on the Simulator		✓
	1.2.11	Pilot Flame Internal Fire Scenario Pipework on the Simulator		✓
	1.2.12	Gas Monitoring		✓
	1.2.13	Temperature Monitoring		✓
	1.2.14	Internal Lighting		✓
	1.2.15	Internal Electrical Power - Simulator systems only		✓
	1.2.16	Control Cabling (I/O `s)		✓
1.3	Mechanical and Electrical Works ASSOCIATED WITH THE FIRE SIMULATOR SYSTEMS ONLY			
	1.3.1	Supply and Fit Mechanical Systems		✓
	1.3.2	Supply and Fit Electrical Systems		✓
	1.3.4	Painting of Rig		✓
	1.3.5	Main Electrical Power to our Control Room	✓	
	1.3.5	Electrical Power from our Control Room to the Simulator		✓
	1.3.6	Electrical Power to the Water Pump if required (We have excluded any water pump)		✓
	1.3.7	NOT APPLICABLE		
	1.3.8	Electrical Power in the Simulator		✓
	1.3.9	Control Cabling from the Control Room to the LPG Tanks		✓
	1.3.10	Control Cabling from Control Room to Water Pump if required		✓
	1.3.11	Control Cabling from LCU to Simulation CDCs (Control Distribution Centres)		✓
	1.3.12	Control Cabling from LCU to the the Simulator		✓
	1.3.13	NA		
	1.3.14	Water Supply Pump if required		✓
	1.3.15	Water Supply - Storage Tank IF REQUIRED		✓
	1.3.16	Water Storage Tank - Main water feed - this is the main water supplt to fill the tank		
	1.3.17	Water Pipework from Water Pump to Simulators by Civil Engineering Contractor	✓	
	1.3.18	Water a 7 bar pressure and at a rate of 2000 litres/minute for colling system		✓
	1.3.19	Water Cooling Pipework on the Simulator		✓
	1.3.20	Kerosene Storage Tank	NOT APPLICABLE	NOT APPLICABLE
	1.3.21	Kerosene Pump	NOT APPLICABLE	NOT APPLICABLE
	1.3.22	Kerosene Fill Point and and Fire Suplestion Systems or Foam Pourer Systems	NOT APPLICABLE	NOT APPLICABLE
	1.3.23	LPG Tanks	✓	

	1.3.24	All underground LPG Liquid Pipework from the LPG Tanks to the Simulators	EXISTING TO BE USED	
	1.3.25	Any necessary upgrage to ANY underground sevicees to meet the new requirements	✓	
	1.3.26	All Underground LPG Vaour Pipework from the LPG Tanks to the Simulators	EXISTING TO BE USED	
	1.3.28	Trace heating and insulation of any pipework to the water pump	✓	
	1.3.29	Trace heating and insulation of any above ground water pipework from the water pump	✓	
1.4	Delivery of Goods			
	1.4.1a	Delivery and Freight of Simulator-		✓
	1.4.1b	Installation of Simulator		✓
1.5	Electrical			
	1.5.1	Main Power Supply	✓	
1.6	Civil Engineering			
	1.6.1	Civil Engineering Design	✓	
	1.6.2	Civil Engineering Construction	✓	
	1.6.3	Underground ducts for Air from Control room to Aircraft Simulator and Fuel Spills	✓	
	1.6.4	Underground Ignition Cable for Air from Control room to LPG Tanks, Aircraft Simulator and Fuel Spills	✓	
	1.6.5	Provision of Air Supply for Comustion Air - either a compressor or BA bottles	✓	
	1.6.6	Dismantling and removal of existing airfract simualtor and associated services	✓	
	1.6.7	Provision of new suitable tie in points to existing LPG gas pipework, power and water inc draw pits etc	✓	
	1.6.7	Underground Duct for Control Cabling from Control Room to Water Pump	✓	
	1.6.8	Surveying of existing slab to identify any 'live services' prior to excavation	✓	
	1.6.9	Underground Duct for Control Cabling from Control Room to Simulation CDCs (Control Distribution)	✓	
	1.6.10	Underground Duct for Control Cabling from Control Room to Control Room in the Simulator	✓	
	1.6.11	Underground Duct for Control Cabling from Control Room to LPG Tanks	✓	
	1.6.12	Underground Ducts for Control Cabling to All Fuel Spills	✓	
	1.6.13	NA		
	1.6.14	Water Storage Tank - Main water feed - IF REQUIRED	✓	
	1.6.15	Water Pipework from Water Pump to Simulator	✓	
	1.6.16	Underground Ducts for all LPG Vapour Pipework from LPG Tanks to the LPG CDCS and to the Fuel Spills	✓	
	1.6.17	Underground Ducts for all LPG Liquid Pipweork from LPG Tanks to the LPG CDCS and to the Fuel Spills	✓	
	1.6.18	Underground Duct for LPG Liquid Pipework from the LPG Tanks to the LPG CDC`'s at the Simulator	✓	
	1.6.19	NA		
	1.6.20	Underground Duct for LPG Vapour Pipework from the LPG Tanks to the LPG CDC`'s at the Simulator	✓	
	1.6.21	NA		
	1.6.22	Control Room Foundation - Design	EXISTING TO BE USED	
	1.6.23	Control Room Foudnation- Construction	EXISTING TO BE USED	
	1.6.24			
	1.6.25	Supply and install control shelter and platform	EXISTING TO BE USED	
	1.6.26	LPG Storage Slab - Design	EXISTING TO BE USED	
	1.6.27	LPG Storage Slab - Construction	EXISTING TO BE USED	
	1.6.28	Water Storage Tank Base Design	✓	
	1.6.29	Water Storage Tank Base Construction	✓	
	1.6.30	Supply and Install staircase and platform to control room - IF REQUIRED	Optional Extra	✓
1.7	Drainage			
	1.7.1	Design and install and drainage for the Fire Training Ground	EXISTING TO BE USED	
	1.7.2	Design and installation of Service Routes / Trenches / Ducts	EXISTING TO BE USED	
	1.7.3	Any requirement to modify or upgrade the existing drainage -	✓	
	1.7.4	Any requirement to modify or upgrade the service routes, trenches, ducts	✓	
1.8	Control Room			
	1.8.1	Design and build control room/enclosure	EXISTING TO BE USED	
1.9	Others			
	1.9.0	Scada system for Simulators in Fire House only	EXCLUDED	EXCLUDED
	1.9.1	Any PA or communication systems	EXCLUDED	EXCLUDED
	1.9.2	Any street or floodlighting	EXCLUDED	EXCLUDED
	1.9.3	Any External Fire Ground Surveillance or CCTV systems	EXCLUDED	EXCLUDED
	1.9.4	Any Infra Red - Thermal Camera Systems	EXCLUDED	EXCLUDED
	1.9.5	Any earthing	✓	
	1.9.6	Any water treatment collection, treatment or recycling plant	EXCLUDED	
	1.9.9	Any artificial smoke system		✓
	1.9.10	Any mechanical extraction system AIRCRAFT ONLY		✓
	1.9.11	Any telephone of moden in control room	✓	
	1.9.12	Any external floodlighting	EXCLUDED	EXCLUDED
	1.9.13	Any Sound Effects	EXCLUDED	EXCLUDED
	1.9.14	Any Visual Effects	EXCLUDED	EXCLUDED
	1.9.15	Any Heat Effects	EXCLUDED	EXCLUDED

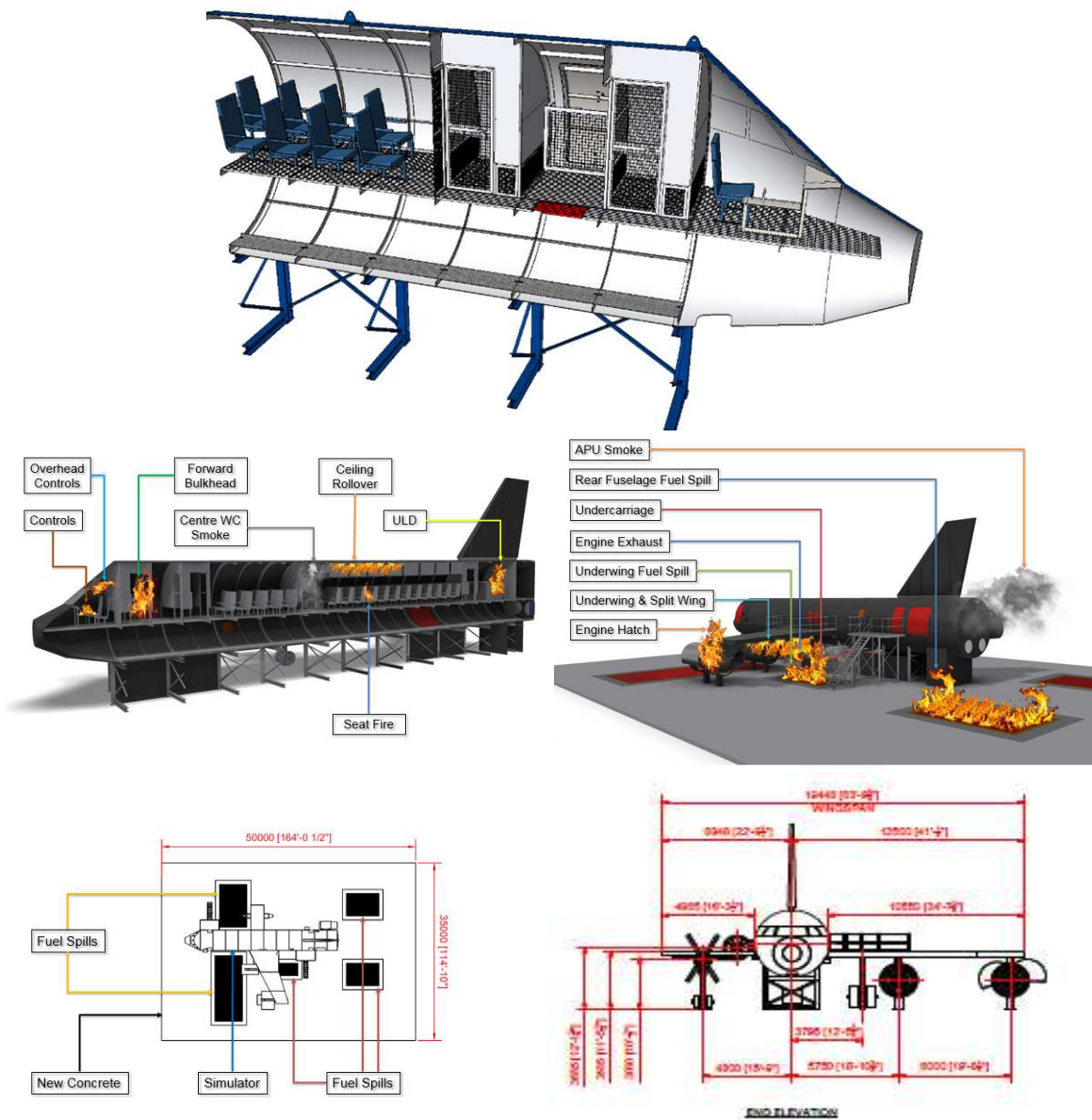
	1.9.16	Any Steam Generation System	EXCLUDED	EXCLUDED
	1.9.17	Any Thermal Image Camera	EXCLUDED	EXCLUDED
	1.9.18	Any Infra Red Camera	EXCLUDED	EXCLUDED
	1.9.19	Any camera recording or playback or screen/desk viewing facility	EXCLUDED	EXCLUDED
	1.9.20	Any area or non simulator internal or external lighting	EXCLUDED	EXCLUDED
	1.9.21	Any sacrificial plates		✓
	1.9.22	Any Small power	EXCLUDED	EXCLUDED
	1.9.23	Any UPS	EXCLUDED	EXCLUDED
	1.9.24	Any other AC ventilation systems	EXCLUDED	EXCLUDED
	1.9.25	Any other mechanical extraction systems	EXCLUDED	EXCLUDED
	1.9.26	Any air intake louvres		✓
	1.9.27	NOT APPLICABLE		NOT APPLICABLE
	1.9.28	Remote Diagnositic Facility to be supplied by Simulation		✓
	1.9.29	Supply either ethernet connection or wireless 3G modem in control for remote diagnostics	✓	
	1.9.30	Any ventilation or airconditioning ductwork		NOT APPLICABLE
	1.9.30	Any work in the Dehumidifying Building		NOT APPLICABLE
	1.9.31	Any real or mock up lift installations		NOT APPLICABLE
1.10	Installation Works			
	1.10.1	Transport of simulator from workshop to site		✓
	1.10.2	Freight of Any specilaised components from overseas to site		✓
	1.10.3	Transport of simulator from port point of entry to construction site		✓
	1.10.4	Import duty	✓	
	1.10.5	Installation		✓
	1.10.6	Site Craneage		✓
	1.10.7	UPS or Back Generator is excluded from a supply point of view	EXCLUDED	EXCLUDED
	1.10.8	Removal of redunant aircraft sim , equipment or infrastrucure	✓	
1.11	Testing			
	1.11.1	System Pressure Tests		✓
	1.11.2	System Functional Tests		✓
	1.11.3	System Electrical Tests		✓
1.12	Commissioning, Manual and Training			
	1.12.1	Extraction		✓
	1.12.2	Water Cooling		✓
	1.12.3	Fire Scenario Systems		✓
	1.12.4	Safety Control and Management Systems		✓
	1.12.5	Complete system commissioning		✓
	1.12.6	Prepare Training Manual		✓
	1.12.7	Training of Operators		✓
1.13	Others			
	1.13.1	All Docs will be in English -		✓
	1.13.2	Training will be delivered in English		✓
	1.13.3	Simulator Earthing to Ground		✓
	1.13.4	Simulator Earthing above Ground	✓	
1.14	Finance			
	1.14.1	All International and domestic travelling, hotel & subsistence for Simulation staff, customer & agent for any travel		✓
	1.14.2	All in country commissions, custom duties, fees and local taxes		✓
	1.14.3	All security, transport and transfers from the airport, hotel, customer amd construction site during the		✓
		tender , construction and commissioning phases of the project		
	1.14.4	Terms of Payment as per our proposal		see PROPOSAL
	1.14.5	Bid Bond		NOT APPLICABLE
	1.14.6	Advance Payment Bond		as required by RFP
	1.14.7	Bank Guarantee		as required by RFP
EXCLUDED ITEMS				
A		Training Needs Analysis	EXCLUDED	EXCLUDED
B		Fire Fighting Water Main and Hydrant System inc Tanks and Pumps	EXCLUDED	EXCLUDED
C		Risk Assessments prior to Fire Fighting Training	EXCLUDED	EXCLUDED
D		Obtaining any third party approvals	EXCLUDED	EXCLUDED
E		Fire Training Course Preparation	EXCLUDED	EXCLUDED
F		Fire Training Instructors	EXCLUDED	EXCLUDED
G		Any third party accreditations	EXCLUDED	EXCLUDED
H		Spare Parts	EXCLUDED	EXCLUDED
I		Planned Preventative Maintenance Programme or Training of Staff to carry out maintenance	EXCLUDED	see PROPOSAL
J		Any third party consultants	EXCLUDED	EXCLUDED
K		Any third party inspectors	EXCLUDED	EXCLUDED
L		LPG Gas Tank Fire Suppression System	EXCLUDED	EXCLUDED

Tab 10 – Build Processes, Features, & Designs That Set Simulation Apart

In order to improve the maintenance service and to demonstrate our commitment to ‘strong and robust’ engineering we have set out some of the features that we have included in our proposal as standard.

Build Process & Designs

A. Comprehensive design and design review



Simulation Live Fire Training Solutions Inc.

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B. Fabrication



C. Site construction and assembly



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D. Commissioning & Testing



Features

A. Gas Monitors



B. Temperature Monitors



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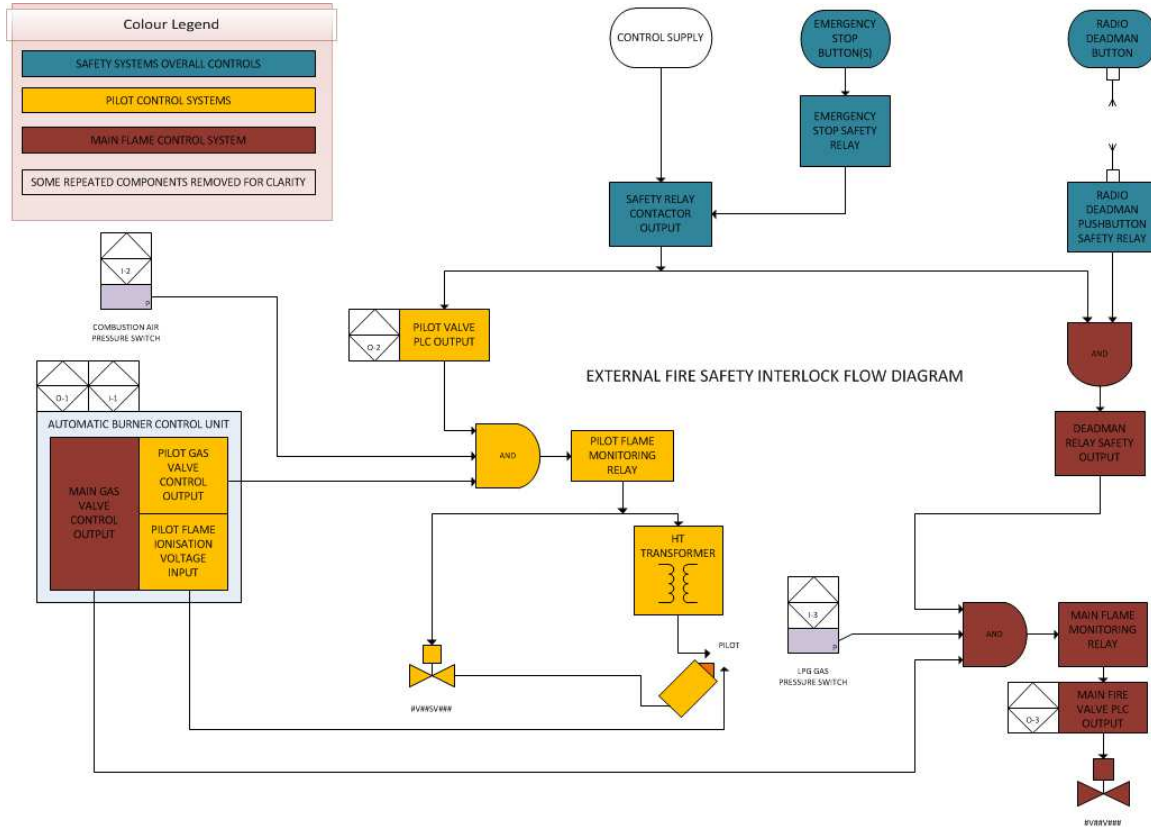
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C. Combustion Air Fans



D. Electronic Ignition and Safety Management Systems



E. Remote diagnostics

17/10/2014 04:09:21		Deadman Drench	Combustion Air Emergency Stop	Alarms		03:40:33 PM 17/10/2014 01:47:51 PM 17/10/2014	Pneumatic Air Pressure Low Plot 18.3A/18.3B -Fuel Spill (5mx10m) Zone 3 ABCU Fault
No.	Time	Date	Status	Text			
175	03:40:33 PM	17/10/2014	I	Pneumatic Air Pressure Low			
260	01:47:51 PM	17/10/2014	I	Plot 18.3A/18.3B -Fuel Spill (5mx10m) Zone 3 ABCU Fault			
265	01:26:28 PM	17/10/2014	IO	Plot 18.3A/18.3B -Fuel Spill (5mx10m) Zone 3 ABCU Lockout			
293	01:15:04 PM	17/10/2014	IO				
292	01:15:04 PM	17/10/2014	IO				
181	11:50:29 AM	12/10/2014	IO	Plot 19A/19B -Fuel Spill (5mx2m) ABCU Fault			
180	11:50:29 AM	12/10/2014	IO	Plot 16.3A/16.3B -Fuel Spill (5mx4m) Zone 3 ABCU Fault			
149	11:36:48 AM	09/10/2014	IO				
213	11:36:47 AM	09/10/2014	IO				
244	11:36:33 AM	09/10/2014	IO	Plot 18.2A/18.2B -Fuel Spill (5mx10m) Zone 2 ABCU Fault			
372	11:08:35 AM	09/10/2014	IO	Plot 24 -Ceiling Fire ABCU Fault			
100	10:30:30 AM	09/10/2014	IO	Plot 11/12 -Port Engine Combustion & Exhaust ABCU Fault			
20	09:15:20 AM	09/10/2014	IO	Plot 03 -Starboard Undercarriage ABCU Fault			
340	07:20:18 AM	09/10/2014	IO	Plot 22 -Toilet Fire ABCU Fault			
18	11:00:48 AM	08/10/2014	IO	Plot 03 -Starboard Undercarriage ABCU Fail to Flame			
25	09:23:36 AM	08/10/2014	IO	Plot 03 -Starboard Undercarriage ABCU Lockout			
9	05:15:34 PM	07/10/2014	IO	Plot 01/02 -Starboard Engine Combustion & Exhaust ABCU Fault			
277	10:30:33 AM	07/10/2014	IO				
14	09:28:51 AM	07/10/2014	IO	Plot 01/02 -Starboard Engine Combustion & Exhaust ABCU Lockout			
13	07:10:33 PM	06/10/2014	IO	Plot 01/02/03 -Port Engine & Underwing MCB Trip			
24	07:10:33 PM	06/10/2014	IO	Plot 01/02/03 - MCB Trip			
40	07:10:33 PM	06/10/2014	IO	Plot 04/05 - MCB Trip			
56	07:10:33 PM	06/10/2014	IO	Plot 04/05 - MCB Trip			
72	07:10:33 PM	06/10/2014	IO	Plot 07/09/10 - MCB Trip			
88	07:10:33 PM	06/10/2014	IO	Plot 11/12/13/14 - MCB Trip			
104	07:10:33 PM	06/10/2014	IO	Plot 11/12/13/14 - MCB Trip			
120	07:10:33 PM	06/10/2014	IO	Plot 11/12/13/14 - MCB Trip			
136	07:10:33 PM	06/10/2014	IO	Plot 15/16/1A - MCB Trip			
152	07:10:33 PM	06/10/2014	IO	Plot 16.1B/16.2A - MCB Trip			
168	07:10:33 PM	06/10/2014	IO	Plot 16.2B/16.3A - MCB Trip			
184	07:10:33 PM	06/10/2014	IO	Plot 16.3B/16.4A - MCB Trip			
200	07:10:33 PM	06/10/2014	IO	Plot 16.4B/17A - MCB Trip			
216	07:10:33 PM	06/10/2014	IO	Plot 17B/18.1A - MCB Trip			
232	07:10:33 PM	06/10/2014	IO	Plot 17B/18A - MCB Trip			
248	07:10:33 PM	06/10/2014	IO	Plot 18.1B/18.2A - MCB Trip			
264	07:10:33 PM	06/10/2014	IO	Plot 18.2B/18.3A - MCB Trip			
280	07:10:33 PM	06/10/2014	IO	Plot 18.3B/18.4A - MCB Trip			
296	07:10:33 PM	06/10/2014	IO	Plot 18.4B/19A - MCB Trip			
312	07:10:33 PM	06/10/2014	IO	Plot 19B/20 - MCB Trip			
328	07:10:33 PM	06/10/2014	IO	Plot 21/22 - MCB Trip			
344	07:10:33 PM	06/10/2014	IO	Plot 21/22 - MCB Trip			
360	07:10:33 PM	06/10/2014	IO	Plot 23/24 - MCB Trip			
376	07:10:33 PM	06/10/2014	IO	Plot 23/24 - MCB Trip			

31/12/2000 10:59:59		Deadman Drench	Combustion Air Emergency Stop	System Setup	
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Selected	
		EXTERNAL		INTERNAL	
External LPG Fire Scenario Prerequisites					
Air Purge complete in 000 seconds				<input checked="" type="checkbox"/>	
Emergency Stop Healthy				<input checked="" type="checkbox"/>	
Electrical System Healthy				<input checked="" type="checkbox"/>	
Air Pressure Healthy				<input checked="" type="checkbox"/>	
Gas Monitors Healthy				<input checked="" type="checkbox"/>	
External Combustion Air Ready				<input checked="" type="checkbox"/>	
Extraction System Healthy				<input checked="" type="checkbox"/>	
Water System Healthy				<input checked="" type="checkbox"/>	
START EXTERNAL SCENARIO					
Internal Fire Scenario Prerequisites					
Air Purge complete in 000 seconds				<input checked="" type="checkbox"/>	
Emergency Stop Healthy				<input checked="" type="checkbox"/>	
Electrical System Healthy				<input checked="" type="checkbox"/>	
Air Pressure Healthy				<input checked="" type="checkbox"/>	
Gas Monitors Healthy				<input checked="" type="checkbox"/>	
Internal Combustion Air Ready				<input checked="" type="checkbox"/>	
Extraction System Healthy				<input checked="" type="checkbox"/>	
Lighting System Healthy				<input checked="" type="checkbox"/>	
START INTERNAL SCENARIO					

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The screenshots show the following data:

External SP (Top Left)

Description	Heat Status	Fuel Flow	No. of Items	Max Fuel Flow (L)	Low Flow (%)	Mid Flow (%)	High Flow (%)
1. Starboard Engine Combustion	Flt Disabled	30	5	180			
2. Starboard Engine Exhaust	Flt Disabled	30	5	180			
3. Starboard Undercarriage	Flt Disabled	30	5	180			
4. Starboard Fuelage	Flt Disabled	30	5	180			
5. Starboard Oil 800 Engine	Flt Disabled	30	5	180			
7. Port Fuelage	Flt Disabled	30	5	180			
8. Port Wheel	Flt Disabled	30	5	180			
16. Port CRKO Log	Flt Disabled	30	5	180			
11. Port Engine 1 Combustion	Flt Disabled	30	5	180			
12. Port Engine 2 Exhaust	Flt Disabled	30	5	180			
13. Port Split Wing	Flt Disabled	30	5	180			
15. Tailor 200 Accessory Fire	Flt Disabled	30	5	180			
16.1. Fuel Spill Zone 1 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.2. Fuel Spill Zone 2 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.3. Fuel Spill Zone 3 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.4. Fuel Spill Zone 4 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.5. Fuel Spill Zone 5 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.6. Fuel Spill Zone 6 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.7. Fuel Spill Zone 7 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.8. Fuel Spill Zone 8 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.9. Fuel Spill Zone 9 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.10. Fuel Spill Zone 10 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.11. Fuel Spill Zone 11 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.12. Fuel Spill Zone 12 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.13. Fuel Spill Zone 13 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.14. Fuel Spill Zone 14 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.15. Fuel Spill Zone 15 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.16. Fuel Spill Zone 16 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.17. Fuel Spill Zone 17 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.18. Fuel Spill Zone 18 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.19. Fuel Spill Zone 19 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35
16.20. Fuel Spill Zone 20 (Dim x 4m)	Flt Disabled	30	5	60	28	30	35

External SP (Top Right)

System MCBs	Status
MCB - Inverter	OK
MCB - A/CU Muxler	OK
MCB - Photo 1, 2 & 3	OK
MCB - Photo 4 & 5	OK
MCB - Photo 6 & 7	OK
MCB - Photo 8 & 9	OK
MCB - Photo 10 & 11	OK
MCB - Photo 12, 13 & 14	OK
MCB - Photo 15 & 16	OK
MCB - Photo 17 & 18	OK
MCB - Photo 19 & 20	OK
MCB - Photo 21 & 22	OK
MCB - Photo 23 & 24	OK
MCB - Photo 25 & 26	OK

Internal SP (Bottom Left)

Thermocouple	State	Value	Setpoint	Units
Thermocouple 1: Front Galley Upper	OK	13.0	70.0	°C
Thermocouple 2: Front Galley Upper	OK	13.0	250.0	°C
Thermocouple 3: Safety Area Upper	OK	13.0	250.0	°C
Thermocouple 4: Safety Area Lower	OK	13.0	70.0	°C
Thermocouple 5: Rear Seat Lower	OK	13.0	70.0	°C
Thermocouple 6: Rear Seat Upper	OK	13.0	250.0	°C
Thermocouple 7: Rear Seat Lower	OK	13.0	70.0	°C
Thermocouple 8: Rear Seat Upper	OK	14.0	70.0	°C

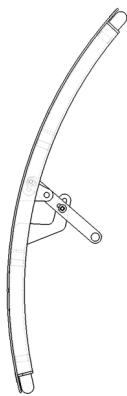
Internal SP (Bottom Right)

Description	Heat Status	Fuel Flow	No. of Items	Max Fuel Flow (L)
20. Seat Fire	Flt Disabled	30	5	180
21. Galley Fire	Flt Disabled	30	5	180
22. Waste Bin Fire	Flt Disabled	30	5	180
23. Cargo Fire	Flt Disabled	30	5	180
24. Galley Fire	Flt Disabled	30	5	180
25. Overhead Instrument Fire	Flt Disabled	30	5	180
26. Flight Deck Fire	Flt Disabled	30	5	180

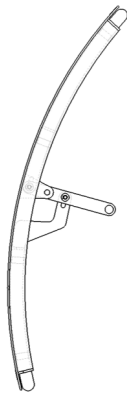
F. Wireless handheld pendant controls of internal fires



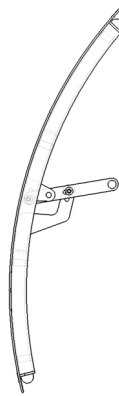
G. Realistic opening mechanisms



Handle down.
Door locked.



Handle raising
[through lost-motion]
Door locked.

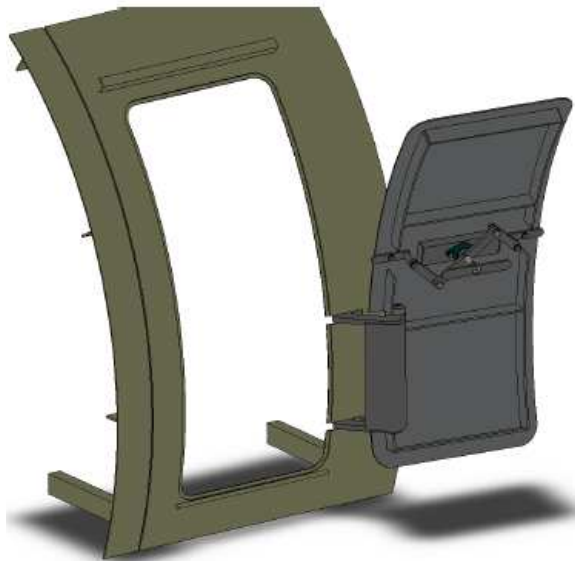
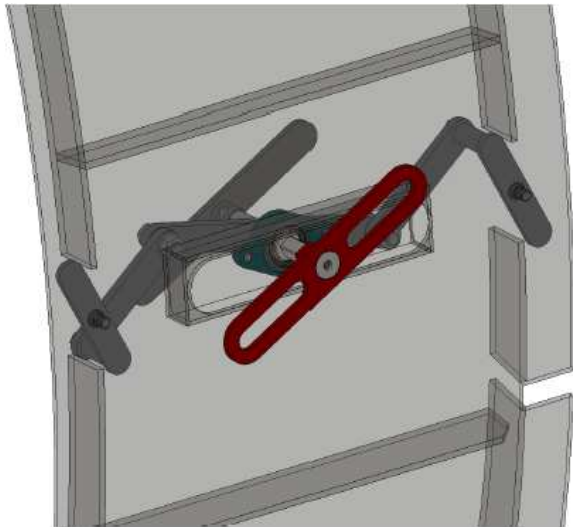


Handle up.
Door unlocked.

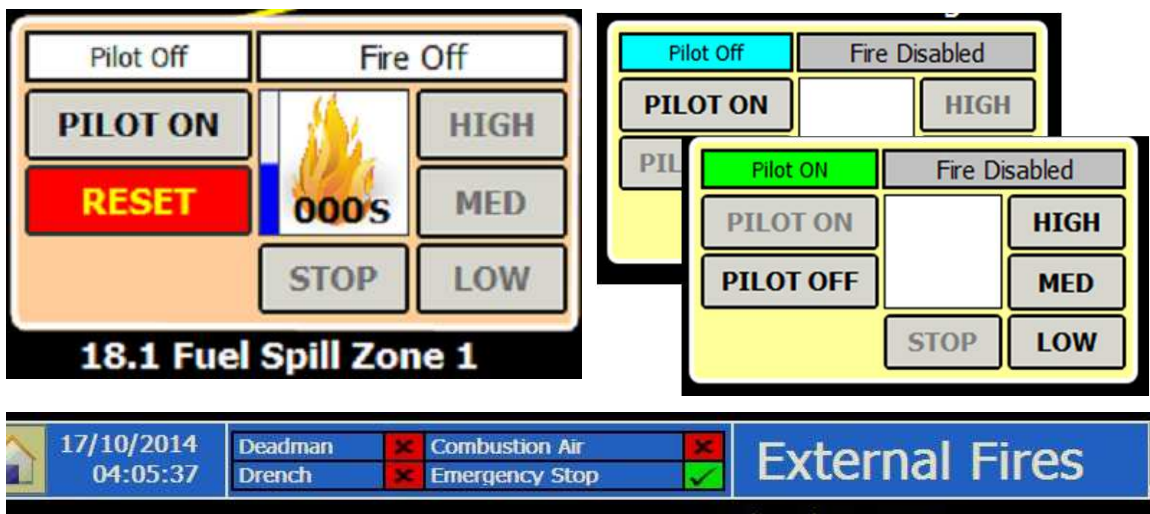


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H. HMI – touch screen operator panel



17/10/2014 04:05:37
 Deadman Combustion Air
 Drench Emergency Stop

External Fires

03:40:33 PM 17/10/2014 Pneumatic Air Pressure Low
 01:47:51 PM 17/10/2014 Pilot 18.3A/18.3B - Fuel Spill (5mx10m) Zone 3 ABCU Fault

1. Star Engine Combustion
 Pilot Disabled: Fire Disabled:
 PILOT ON: PILOT OFF:

2. Star Engine Exhaust
 PILOT ON: PILOT OFF:

5. Starboard CRJ 900 Engine
 Pilot Disabled: Fire Disabled:
 PILOT ON: PILOT OFF:

6. APU Smoke
 Power Off: SMOKE ON: SMOKE OFF:

4. Starboard Fuselage
 Pilot Disabled: Fire Disabled:
 PILOT ON: PILOT OFF:

3. Starboard Undercarriage
 Pilot Disabled: Fire Disabled:
 PILOT ON: PILOT OFF:

17. Fuel Spill 3m x 1m
 Pilot Disabled: Fire Disabled:
 PILOT ON: PILOT OFF:

16.1 Fuel Spill Zone 1
 Pilot Disabled: Fire Disabled:
 PILOT ON: PILOT OFF: PILOT OFF: STOP:

16.2 Fuel Spill Zone 2
 PILOT ON: PILOT OFF: PILOT OFF: STOP:

16.3 Fuel Spill Zone 3
 PILOT ON: PILOT OFF: PILOT OFF: STOP:

16.4 Fuel Spill Zone 4
 PILOT ON: PILOT OFF: PILOT OFF: STOP:

17/10/2014 04:07:24
 Smoke Machines Extraction Systems
 Lighting Systems Emergency Stop

Internal Fires

03:40:33 PM 17/10/2014 Pneumatic Air Pressure Low
 01:47:51 PM 17/10/2014 Pilot 18.3A/18.3B - Fuel Spill (5mx10m) Zone 3 ABCU Fault

8. Rear Seat High
 OK 14.0 °C
 OK 13.0 °C

3. Seating Area Front High
 OK 14.0 °C
 OK 13.0 °C

2. Front Galley High
 OK 13.0 °C
 OK 13.0 °C

7. Rear Seat Low
 Pilot Disabled

4. Seating Area Front Low
 Pilot Disabled

1. Front Galley Low
 Pilot Disabled

6. Rear Door High
 OK 13.0 °C
 OK 13.0 °C

Smoke Front
 Power Off: SMOKE ON: SMOKE OFF:

Smoke Rear
 Power Off: SMOKE ON: SMOKE OFF:

Gas Monitor 01
 OK 0.1 %
 OK 0.0 %

5. Rear Door Low
 Pilot Disabled

Gas Monitor 02
 OK 0.1 %
 OK 0.0 %

I. Hydraulic cargo doors

