

FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 001	
HAZARD (One hazard per page) Crash (or dead stick landing)			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Loss of thrust during TO/LDG or in-flight					
SYSTEM/FUNCTION/ACTIVITY Engine operation					
CAUSE OF UNDESIRE EVENT 1) Loss of fuel flow (contamination/exhaustion) 2) Loss of fuel flow due to starvation (blockage/pump failure/excessive unloaded or inverted flight) Resulting in engine failure					
EFFECT OF UNDESIRE EVENT CFIT resulting in loss of T1 or LOC resulting damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage)					
CONTROLS/CORRECTIVE ACTION 1a) Engine testing performed introducing large amounts of air into fuel pump. (Engine is very robust and loss of thrust aprox. 10-15%.) 1b) Trained personnel on fueling/de-fueling process to prevent contamination 2a) Engine testing demonstrated engines and fuel systems are robust and can accommodate widely varying fuel flows 2b) Using COTS R/C components 2c) Fuel system using header tank which prevents starvation and a weighted fuel pickup that adjusts to unusual attitudes 2d) Will use observed fuel consumption data to establish max flight times with reserve (10%-20% reserve based on actual observed usage data)					
REMARKS/ADDITIONAL INFORMATION: Hazard does not address/include injury to personnel or collateral damage. 1) 2) Testing has determined inverted/unloaded flight is only limited by the amount of fuel onboard			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
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PREPARED BY: (b) (6)		CHECKED BY AE:		CHECKED BY ASO:	
<div style="border: 1px solid black; width: 100px; height: 100px; background-color: black; margin-bottom: 5px;"></div> <div style="text-align: right;"> <u>Apr 27, 2009</u> Date </div>		<div style="text-align: right;"> _____ Printed Name </div> <div style="text-align: right;"> _____ Signature </div> <div style="text-align: right;"> _____ PIN </div>		<div style="text-align: right;"> _____ Printed Name </div> <div style="text-align: right;"> _____ Signature </div> <div style="text-align: right;"> _____ PIN </div>	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 – 002		
HAZARD (One hazard per page) Crash (or dead stick landing)			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT Loss of thrust during TO/LDG or in-flight						
SYSTEM/FUNCTION/ACTIVITY Engine operation						
CAUSE OF UNDESIRE EVENT 1) Airflow loss/disruption 2) Engine Flameout Resulting in engine failure						
EFFECT OF UNDESIRE EVENT CFIT resulting in loss of T1 or LOC resulting damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)						
CONTROLS/CORRECTIVE ACTION 1a) Proven inlet/nacelle design, fabrication in accordance with scale aircraft information 1b) Utilized "leaf blower" to ingest air directly into engines at all angles of attack/sideslip. (Engines not alpha/beta sensitive) 1d) FOD screen on engine intake 2a) Header tank with air trap (air trap reduces/eliminates air in line) to mitigate fuel disruption. 2b) Engine remains lit with robust combustion chamber. Engine does not have continuous igniter. (See engine testing summary documentation)						
REMARKS/ADDITIONAL INFORMATION: Hazard does not address/include injury to personnel or collateral damage. 1) Site Safety procedures require daily FOD walks on runway Document GTMP-2003 2) Testing has determined inverted/unloaded flight is only limited by the amount of fuel onboard 3) The Project has fully investigated in-flight re-light capability, and determined that at this point the technology is not developed for an in-flight re-light/restart of this type engine.			RISK ASSESSMENT*			
			SEVERITY		I	
			LOCAL HAZARD PROBABILITY/RAC		D	
			PRECEDING HAZARDS PROBABILITY			
			NET PROBABILITY			
		NET RAC		3		
PREPARED BY: (b) (6) _____ Apr 27, 2009 Date		CHECKED BY AE: _____ Printed Name _____ Signature PIN _____ Date		CHECKED BY ASO: _____ Printed Name _____ Signature PIN _____ Date		
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FLIGHT RESEARCH HAZARD ANALYSIS	PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 – 003
HAZARD (One hazard per page) Crash (or dead stick landing)	PHASE OF OPERATION T, I, L	ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT Loss of thrust during TO/LDG or in-flight			
SYSTEM/FUNCTION/ACTIVITY Engine operation			
CAUSE OF UNDESIRE EVENT 1) Mechanical Failure (FOD/poor design/poor fabrication or installation) Resulting in engine failure			
EFFECT OF UNDESIRE EVENT CFIT resulting in loss of T1 or LOC resulting damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)			
CONTROLS/CORRECTIVE ACTION 1a) Manufacturers product information, engine history data, and installation documentation used in engine evaluation. The project has chosen a COTS engine that is well tested, with a high degree of reliable 1b) Developed aircraft preflight inspection, FOD walk down, turnaround and post flight inspection to observe damage prior to/post flight (Inspection checklist GTMP-2022, GTMP-2003 and GTMP-2067) 1c) Motors inspected in accordance with engine manufacture's recommendations 1d) Factory FOD screens incorporated on inlet of engine			
REMARKS/ADDITIONAL INFORMATION: Hazard does not address/include injury to personnel or collateral damage. Motors serviced or replaced in accordance with engine manufacture's recommendations Generic: Stall speeds were examined, and documented (See GTM 4030) Flight briefing guide developed to cover emergencies, control failures and flight specifics Aircraft "checkout" plan developed for flights and all aircraft systems Determined engine out flight profiles and appropriate responses		RISK ASSESSMENT*	
		SEVERITY	I
		LOCAL HAZARD PROBABILITY/RAC	C
		PRECEDING HAZARDS PROBABILITY	
		NET PROBABILITY	
		NET RAC	2
PREPARED BY: <div style="background-color: black; color: red; padding: 2px;">(b) (6)</div> _____ Apr 27, 2009 Date	CHECKED BY AE: _____ Printed Name _____ Signature Date PIN	CHECKED BY ASO: _____ Printed Name _____ Signature Date PIN	CLOSED OUT BY ASRB: _____ Printed Name _____ Signature Date PIN

FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 004	
HAZARD (One hazard per page) Crash (or dead stick landing)			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Loss of thrust during TO/LDG or in-flight					
SYSTEM/FUNCTION/ACTIVITY Engine operation					
CAUSE OF UNDESIRE EVENT 1) Loss of throttle control signal 2) Pilot error Resulting in engine failure					
EFFECT OF UNDESIRE EVENT CFIT resulting in loss of T1 or LOC resulting damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1a) Loss of any connection from receiver back, secures motor. See engine failure GTMP-2030 All wire connections have backup securing method. 1b) Checklist requires a pre-flight range check on transmitters and receivers, including ensuring appropriate fail-safe position checkout (GTMP-2067) 2) Robust and sustained pilot training program, from trainer aircraft to advanced jets. Pilot training document (GTMP-8002). Engine failure in-flight (GTMP -2030)					
REMARKS/ADDITIONAL INFORMATION: Hazard does not address/include injury to personnel or collateral damage. 1) Fail-safe settings are throttle position idle, gear down, brakes on, flaps down and pitch up, pre-takeoff checks ensure that fail-safe works prior to flight Generic: Procedures developed for takeoff and landing engine failure (versus engine failure in-flight) (GTMP -2030)			RISK ASSESSMENT*		
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			LOCAL HAZARD PROBABILITY/RAC		D
			PRECEDING HAZARDS PROBABILITY		
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 005		
HAZARD (One hazard per page) Crash (or dead stick landing)			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT Loss of thrust during TO/LDG or in-flight						
SYSTEM/FUNCTION/ACTIVITY Engine operation						
CAUSE OF UNDESIRE EVENT 1) ECU failure (electrical/battery/regs. low/high) 2) Fuel Pump failure (elec./mech./ or supplies high/low) 3) Fire Resulting in engine failure						
EFFECT OF UNDESIRE EVENT CFIT resulting in loss of T1 or LOC resulting damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)						
CONTROLS/CORRECTIVE ACTION 1a) Engine testing reveals any connections lost aft of receiver, secures motor. (Engine failure in-flight GTMP-2030) All wire connections have backup securing method. 1b) Robust pilot training program covering in-flight emergencies. (GTMP-8002) 1c) Utilizing off the shelf, "proven" components 2a) Utilizing off the shelf, "proven" components 2b) Robust pilot training program covering in-flight emergencies. (GTMP-8002) 3a) On deck and in-flight fire procedures developed (GTMP-2030) 3b) Fire fighting equipment on hand during all operations (ground, flight, servicing, etc.)						
REMARKS/ADDITIONAL INFORMATION: Hazard does not address/include injury to personnel or collateral damage. 1) un-commanded throttle procedure (fly till fuel exhausted or perform CFIT) (GTMP-2030) Generic: Procedures developed for To/Ldg engine failure (versus engine failure in flight) (GTMP-2030) On board data acquisition and telemetry system transmits battery and engine health data and status to the operations station where it is monitored.			RISK ASSESSMENT*			
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			PRECEDING HAZARDS PROBABILITY			
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 006	
HAZARD (One hazard per page) Crash (or dead stick landing)			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Loss of thrust during TO/LDG or in-flight					
SYSTEM/FUNCTION/ACTIVITY Engine operation					
CAUSE OF UNDESIRE EVENT 1) Environmental 2) Loss of engine thermocouple (or thermocouple "moves) or engine RPM signal Resulting in engine failure					
EFFECT OF UNDESIRE EVENT CFIT resulting in loss of T1 or LOC resulting damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1a) Engine testing and operations has verified that the engine functions properly within the weather limitations set by the Projects Weather Condition Guidelines. (Cold temperatures can cause difficulty in starting.) Weather Condition Guidelines for Safe AirSTAR Flight Operations GTMP-2072 developed to cover go/no go weather conditions. 1b) Weather conditions briefed in preflight safety meeting 2a) Engine testing reveals loss of temperature signal, secures engine. Engine failure in-flight procedures (GTMP-2030) briefed in preflight safety meeting 2b) Robust pilot training program covering in-flight emergencies. Engine failure in-flight procedure (GTMP-2030) briefed in preflight safety meeting 2c) Inspections incorporated to ensure engine thermocouple securely held in position (or engine temps out of tolerance and engine will secure) 2d) On board data acquisition and telemetry system transmits battery and engine health data and status to the mobile operations station where it is monitored					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage.			RISK ASSESSMENT*		
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			LOCAL HAZARD PROBABILITY/RAC		D
			PRECEDING HAZARDS PROBABILITY		
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 007		
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT LOC						
SYSTEM/FUNCTION/ACTIVITY Controlled flight of aircraft						
CAUSE OF UNDESIRE EVENT 1) Pilot Error, Pilot Induced Oscillation (PIO), loss of Situation Awareness (SA) 2) Improper Weight and Balance calculations (design, installation, inspection) <u>OR</u> weight shifts due to unsecured component/structure						
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)						
CONTROLS/CORRECTIVE ACTION 1) Robust pilot training program using progressively advanced models 1) Pilot training includes simulation of emergency scenarios with the simulator and training aircraft where appropriate 1) Aircraft color scheme developed to reduces likelihood of pilot loss of SA 2) Use established baseline weight and balance limits, and ensure within limits on preflight checklist (See GTM 4010 and 4046 for cg limits)						
REMARKS/ADDITIONAL INFORMATION: Hazard does not address/include injury to personnel or collateral damage. 1) Aircraft is operated by one pilot with back up pilot/spotter pilot in close proximity, pilots use standard challenges and replies (T/O, landing checks etc.) 1) Emergency procedures developed and memorized. Emergency scenarios simulated and team responses monitored/reviewed 2) Aircraft interior inspected to prevent possible weight and balance shifts/failures (under G-loading) in-flight(air bottle, batteries etc.) (To be performed at each inspection) GTMP-2022			RISK ASSESSMENT*			
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 008	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Controlled flight of aircraft					
CAUSE OF UNDESIRE EVENT 1) Aerodynamics: flight control rigging, inadequate design, operating outside flight envelope (stall, etc.) 2) Environmental Factors					
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1) Using off the shelf (or proven) aircraft design constructed in accordance with manufacturer's instructions 1) Robust and sustained pilot training program, from trainer aircraft to advanced jets 1) On board data acquisition and telemetry system transmits altitude, air speed and aircraft health data to the operations station where it is displayed and monitored. 2) Implementing color scheme that maximizes visibility/orientation					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. 2) SOP developed and followed for acceptable flight conditions(See safety document GTMP-2072)			RISK ASSESSMENT*		
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PREPARED BY: (b) (6) Apr 27, 2009 Date		CHECKED BY AE: _____ Printed Name Signature _____ Date PIN _____		CHECKED BY ASO: _____ Printed Name Signature _____ Date PIN _____	
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FLIGHT RESEARCH HAZARD ANALYSIS	PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 009
HAZARD (One hazard per page) Crash		PHASE OF OPERATION I	ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC			
SYSTEM/FUNCTION/ACTIVITY Controlled flight of aircraft			
CAUSE OF UNDESIRE EVENT 1) Flight controls failure due to design, fabrication, or installation 2) Structural Failure of aircraft (Design/Fab./Installation etc.) 3) Midair / bird strike			
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)			
CONTROLS/CORRECTIVE ACTION 1a) Devised and implemented flight control emergency procedures. (See Document GTMP-2030) 1b) Using off the shelf R/C components 1c) Perform high/low speed taxi testing prior to first flight 1d) Inspection checklist utilized to ensure all systems secure prior to flight (GTMP-2022, GTMP-2067) 2a) Structure analyzed or proof loaded to verify integrity. 2b) Stress analysis report (GTMP-4004) 2c) Ensure needed clearances/tolerances on aircraft components 3) Spotter by pilots side to identify hazards such as birds			
REMARKS/ADDITIONAL INFORMATION: Hazard does not address/include injury to personnel or collateral damage. 3) Wallops has personnel trained in using tools to deter and/or scatter birds that may choose to loiter in the operations area and are willing to provide this service upon request 3) Information on bird not available if operating at Aberdeen Field in Smithfield Due to size ratio (i.e. resulting damage) will likely lead to loss of T1		RISK ASSESSMENT*	
		SEVERITY	I
		LOCAL HAZARD PROBABILITY/RAC	C
		PRECEDING HAZARDS PROBABILITY	
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PREPARED BY: (b) (6) Apr 27, 2009 Date	CHECKED BY AE: _____ Printed Name _____ Signature PIN _____ Date	CHECKED BY ASO: _____ Printed Name _____ Signature PIN _____ Date	CLOSED OUT BY ASRB: _____ Printed Name _____ Signature PIN _____ Date

FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 010	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Controlled flight of aircraft					
CAUSE OF UNDESIRE EVENT 1) Loss or interruption of RF signal(s) XMTR or Receiver 2) EMI 3) Inadequate system design					
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1a) Fail safe mode (ensure engines to idle, gear down, flaps down, pitch up) 1b) Preflight checklist requires R/F distance testing prior to every flight day (GTMP-2012) 2a) Crew members trained on the process for turning on transmitter to prevent two transmitters, on same freq., from being turned on at same time 2b) Conducted susceptibility testing with engines operating and found no anomalies 2c) Scanners used to ensure no external EMI that could be detrimental to aircraft control 2d) Use Anechoic chamber testing to verify onboard components are compatible (not generating EMI that would be detrimental to aircraft control) 2e) Pilot can turn both off with one switch on the transmitter 3) Using off the shelf R/C components					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage.			RISK ASSESSMENT*		
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PREPARED BY: (b) (6) or 27, 2009 Date		CHECKED BY AE: Printed Name Signature _____ Date _____ PIN _____		CHECKED BY ASO: Printed Name Signature _____ Date _____ PIN _____	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 011		
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT LOC						
SYSTEM/FUNCTION/ACTIVITY Controlled flight of aircraft						
CAUSE OF UNDESIRE EVENT 1) Poor fabrication or installation resulting in lost of command and control system failure						
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage)						
CONTROLS/CORRECTIVE ACTION 1a) Using off the shelf R/C components 1b) Utilizing manufacturer's installation recommendations 1c) All documentation completed and up to date (logbook, inspections, air worthiness) and components secure and working properly prior to flight 2a) Flight operations and hazard area developed for each site and reviewed with pilots & spotters 2b) The pilot trained to maintain visual contact and situational awareness of the aircraft orientation. (MOS has tracking camera & Safety Pilot has sight of T1)						
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. 2) Emergency procedures require initiating fail safe if aircraft flies out of operations area and is not turning to or responding to commands that would return it to the operations area. (GTMP-2030) 2) RF signal has been tested to more than one mile. Vehicle flown out of reception area (poor navigation) and loss of signal see T1 – 034			RISK ASSESSMENT*			
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 012	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Controlled flight of aircraft					
CAUSE OF UNDESIRE EVENT 1) Control Laws/aircraft stability 2) Interference with signal (another transmitter on same freq., EMI ..., fail-safe mode entry) 3) Antenna failure resulting in loss of control flight of aircraft lost due to command and control system failure					
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1a) Using commercially available or off the shelf or "proven" aircraft design 1b) Use pervious data to estimate flight, landing and stall speed, evaluate estimate with slow flight at altitude that will allow for safe recovery 1c) Vn diagram developed and reviewed during pilot's meetings 2) Batteries, and XMTR checks prior to every flight 3a) Using commercially available or off the shelf 3b) Perform system check prior to flight					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage.			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 013		
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT loss of landing gear integrity/functionality or loss of aerodynamic characteristics						
SYSTEM/FUNCTION/ACTIVITY Landing Gear						
CAUSE OF UNDESIRE EVENT 1) Loss of air pressure (leak in bottle, lines, T's/air charge or pressure v valves, etc.) 2) Failure of RF system prior to servo (XMTR, receiver, sequencer etc.) 3) Electrical/Mechanical failure of landing gear servo causing Landing Gear to fail to retract or fail to extend with aircraft in flight (all extend, nose wheel, one main, both mains, stub gear, cocked nose wheel)						
EFFECT OF UNDESIRE EVENT LOC resulting in damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)						
CONTROLS/CORRECTIVE ACTION 1) Landing gear system and braking system separated into two completely separate pneumatic systems. 1) Compressed air reserve capable of 4 or more gear up and down cycles 1) Emergency procedures developed for landing gear failures (GTMP-2030) 1) Aircraft inspection after 25 flights airlines replaced as required 2) Emergency procedures document GTMP-2030. (Will lead to either gear all up or all down with inability to change configuration) 3) Emergency procedures document GTMP-2030. (Sequencer failure will lead to all gear up or all gear down scenario, and inability to change configuration)						
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. 1) Barb on fittings prevent air lines from detaching. 1) Limit max pressure by relief setting on charging pump 1) Determined acceptable number of gear cycles (thru on deck testing) 1) "Leak down" test of air sys conducted during airworthiness inspection (Checklist GTMP-2022)			RISK ASSESSMENT*			
			SEVERITY		I	
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			PRECEDING HAZARDS PROBABILITY			
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1-014		
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT loss of landing gear integrity/functionality or loss of aerodynamic characteristics						
SYSTEM/FUNCTION/ACTIVITY Landing Gear						
CAUSE OF UNDESIRE EVENT 1) Failure of landing gear air switching valve 2) Gear, gear door, nose wheel steering mechanical binding causing Landing Gear to fail to retract or fail to extend with aircraft in flight (all extend, nose wheel, one main, both mains, stub gear, cocked nose wheel)						
EFFECT OF UNDESIRE EVENT LOC resulting in damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)						
CONTROLS/CORRECTIVE ACTION 1a) See emergency procedures document GTMP-2030. (Should lead to all gear up or all gear down scenario with inability to change) 1b) Checked prior to flight GTMP-2012 2) Actual hardware tested and confirmed proper system design prior to flight						
REMARKS/ADDITIONAL INFORMATION: Hazard does not address/include injury to personnel or collateral damage. Generic: Emergency procedures for Ldg gear failure modes developed (fails extend, retract, or, partial gear cocked nose wheel) See project document GTMP-2030. Examined failure modes (loss of bottle pressure) with transmitter gear will not free fall even with high G maneuver Through experience gear up landings in the past have caused very little damage to the aircraft.			RISK ASSESSMENT*			
			SEVERITY		I	
			LOCAL HAZARD PROBABILITY/RAC		C	
			PRECEDING HAZARDS PROBABILITY			
			NET PROBABILITY			
		NET RAC		2		
PREPARED BY: (b) (6) Apr 27, 2009 Date		CHECKED BY AE: Printed Name Signature PIN Date		CHECKED BY ASO: Printed Name Signature PIN Date		
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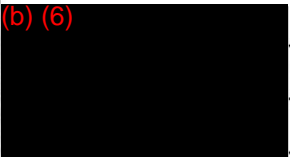
FLIGHT RESEARCH HAZARD ANALYSIS	PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 015
HAZARD (One hazard per page) Crash	PHASE OF OPERATION T, I, L	ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT loss of landing gear integrity/functionality or loss of aerodynamic characteristics			
SYSTEM/FUNCTION/ACTIVITY Landing Gear			
CAUSE OF UNDESIRE EVENT 1) Blockage in air system (Lines pinched/Contamination) 2) Air bottle bursts 3) Human error (air bottle insufficiently serviced) causing Landing Gear to fail to retract or fail to extend with aircraft in flight (all extend, nose wheel, one main, both mains, stub gear, cocked nose wheel)			
EFFECT OF UNDESIRE EVENT Crash landing or LOC resulting in damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)			
CONTROLS/CORRECTIVE ACTION 1) Utilizing filtered compressed air for bottle servicing 2a) Air bottle rated for 150 psi (only charges to 110 psi) 2b) Air lines and connections capable of maintaining air pressure 3) Trained operators utilizing checklists			
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. Generic: Using commercially available or off the shelf or "proven" aircraft design		RISK ASSESSMENT*	
		SEVERITY	I
		LOCAL HAZARD PROBABILITY/RAC	C
		PRECEDING HAZARDS PROBABILITY	
		NET PROBABILITY	
		NET RAC	2
PREPARED BY: (b) (6) Apr 27, 2009 Date	CHECKED BY AE: _____ Printed Name _____ Signature PIN _____ Date	CHECKED BY ASO: _____ Printed Name _____ Signature PIN _____ Date	CLOSED OUT BY ASRB: _____ Printed Name _____ Signature PIN _____ Date

FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 016	
HAZARD (One hazard per page) Gear Collapse			PHASE OF OPERATION G		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Un-commanded or inadvertent raising of gear on deck					
SYSTEM/FUNCTION/ACTIVITY Landing Gear					
CAUSE OF UNDESIRE EVENT 1) Servicing personnel/pilot error 2) Error in control system (EMI, receiver failure modes etc.)					
EFFECT OF UNDESIRE EVENT Possible personnel injury (pinched digits) and/or minimal damage to T1 model					
CONTROLS/CORRECTIVE ACTION 1) Robust pilot/crew training, and use of standardized checklists 2) Control system reviewed, inspected and tested prior to flight, Flight Readiness Review, air worthiness certification process 2) EMI testing in the anechoic chamber					
REMARKS/ADDITIONAL INFORMATION Generic: Preflight checklist uses challenge and reply to ensure gear commanded down (not just gear actually down) prior to T/O (GTMP-2012) Personnel trained on process for servicing aircraft			RISK ASSESSMENT*		
			SEVERITY		III
			LOCAL HAZARD PROBABILITY/RAC		B
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
NET RAC		3			
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 017	
HAZARD (One hazard per page) Gear Collapse			PHASE OF OPERATION G		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Un-commanded or inadvertent raising of gear on deck or landing					
SYSTEM/FUNCTION/ACTIVITY Landing Gear					
CAUSE OF UNDESIRE EVENT 1) Landing gear switching valve failure 2) Leak in air system between switching valve and gear air actuators (positive air pressure required to lock main gear)					
EFFECT OF UNDESIRE EVENT Possible personnel injury (pinched digits) and/or minimal damage to T1 model					
CONTROLS/CORRECTIVE ACTION 1) Using off the shelf R/C components (fabricated at factory) 2) Actual hardware testing determined that a loss of air pressure will not lead to inadvertent gear collapse (due to nose gear over center pivot, and main gear locking "pins")					
REMARKS/ADDITIONAL INFORMATION Generic: Preflight checklist uses challenge and reply to ensure gear commanded down (not just gear actually down) prior to T/O (GTMP-2012) Checklist and training incorporated to make personnel aware of dangers posed by landing gear system			RISK ASSESSMENT*		
			SEVERITY		III
			LOCAL HAZARD PROBABILITY/RAC		D
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
		NET RAC		3	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 018	
HAZARD (One hazard per page) Brake Failure		PHASE OF OPERATION T, L, G (taxi/abort)		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT Brakes fail to engage (or one brake fails)					
SYSTEM/FUNCTION/ACTIVITY Brakes					
CAUSE OF UNDESIRE EVENT 1) Pilot error 2) Loss of air pressure (Leak in system-bottle, lines/T's/air charge or pressure v valves, brakes, etc.) 3) Failure of RF system prior to servo (XMTR, receiver, elevator switch etc.)					
EFFECT OF UNDESIRE EVENT Aircraft departs runway or paved taxi way and/or cartwheels and/or resulting in damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1) Trained on normal operating process and emergency operating procedures. (GTMP-2030) 2) Conducted test with actual hardware to validate design of brake lines are clear of area of possible impingement before, during and after gear actuation 2) Loss prior to brake valve will likely lead to no brakes, failures aft of brake valve will lead to loss of one brake 3) Should result in all or nothing brake failure, See project document GTMP-2030.					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. Procedure calls for all personnel clear of area during all T/O, Ldgs 3) Pilot error could lead to landing with brakes applied without aircrew knowledge. All other failures will most probably result in landing with no brakes.				RISK ASSESSMENT*	
				SEVERITY	I
				LOCAL HAZARD PROBABILITY/RAC	C
				PRECEDING HAZARDS PROBABILITY	
				NET PROBABILITY	
				NET RAC	2
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 019	
HAZARD (One hazard per page) Brake Failure		PHASE OF OPERATION T, L, G (taxi/abort)		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT Brakes fail to engage (or one brake fails)					
SYSTEM/FUNCTION/ACTIVITY Brakes					
CAUSE OF UNDESIRE EVENT 1) Electrical/Mechanical failure 2) Failure of brake valve 3) Loss of air pressure, blockage in air system (Line pinched/Contaminated)					
EFFECT OF UNDESIRE EVENT Aircraft departs runway or paved taxi way and/or cartwheels and/or resulting in damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1) See emergency procedures document GTMP-2030. (Resulting in failure of both brakes either on or off) 2) See emergency procedures document GTMP-2030. (Resulting in failure of both brakes either on or off) 3a) Hardware testing confirmed continual brake application will not bleed down air supply unless there is a leak in the system 3b) Utilizing filtered compressed air for servicing the system (in accordance with servicing process). See appropriate emergency procedure (GTMP-2030) 3c) Conducted test with actual hardware to validate design of brake lines are clear of area of possible impingement before, during and after gear actuation					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. Generic: Configuration management implemented for all Xmtr software programming Brake testing conducted as part of preflight checks GTMP-2012 Lost brakes procedures are established and reviewed. Project document GTMP-2030. Brakes receive adequate maintenance according to manufacturers instructions				RISK ASSESSMENT*	
				SEVERITY	I
				LOCAL HAZARD PROBABILITY/RAC	C
				PRECEDING HAZARDS PROBABILITY	
				NET PROBABILITY	
				NET RAC	2
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 020	
HAZARD (One hazard per page) Brake Failure			PHASE OF OPERATION T, L, G (taxi/abort)		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Brakes fail to engage (or one brake fails)					
SYSTEM/FUNCTION/ACTIVITY Brakes					
CAUSE OF UNDESIRE EVENT 1) Air bottle bursts 2) Failure of tire/rim brake system					
EFFECT OF UNDESIRE EVENT Aircraft departs runway or paved taxi way and/or cartwheels and/or resulting in damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1) Air tanks are rated by manufacturer for 150psi, while they will only be charged to 110 psi 2) For emergency procedures see project document GTMP-2030.					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. Generic: Failure of both brakes not likely to lead to aircraft damage (using long runways, secure engine before aircraft departs runway)			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
		NET RAC		2	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 021	
HAZARD (One hazard per page) Brake Failure			PHASE OF OPERATION T, L, G (taxi/abort)		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Brakes fail to engage (or one brake locks)					
SYSTEM/FUNCTION/ACTIVITY Brakes					
CAUSE OF UNDESIRE EVENT 1) Pilot error 2) Failure of RF system prior to servo (XMTR, receiver, etc.) 3) Electrical/Mechanical failure					
EFFECT OF UNDESIRE EVENT Aircraft departs runway or paved taxi way and/or cartwheels and/or resulting in damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1) PIC and Spotter Pilot review landing configuration prior to landing (brakes off) 2) See emergency procedures document GTMP-2030. (Resulting in failure of both brakes either on or off) 3) See emergency procedures document GTMP-2030. (Resulting in failure of both brakes either on or off)					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. Generic: Brakes if locked (are probably not sufficient enough to remain locked on landing), however locked brakes will likely lead to tire damage, possibly aircraft departing runway			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
		NET RAC		2	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 022	
HAZARD (One hazard per page) Brake Failure			PHASE OF OPERATION T, L, G (taxi/abort)		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Brakes fail to engage (or one brake locks)					
SYSTEM/FUNCTION/ACTIVITY Brakes					
CAUSE OF UNDESIRE EVENT 1) Failure of brake valve 2) Blockage in air system (Lines pinched/Contamination)					
EFFECT OF UNDESIRE EVENT Aircraft departs runway or paved taxi way and/or cartwheels and/or resulting in damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1a) If brakes are left applied or "slightly" applied this will not bleed down the air reservoir. 1b) See emergency procedures document GTMP-2030. (Resulting in failure of both brakes either on or off) 2a) Utilizing filtered compressed air for bottle servicing (in accordance with servicing process). 2b) Conducted test with actual hardware to validate design of brake lines are clear of area of possible impingement before, during and after gear actuation					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage.			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
			NET RAC		2
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 023	
HAZARD (One hazard per page) Brake Failure			PHASE OF OPERATION T, L, G (taxi/abort)		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Brakes fail to engage (or one brake locks)					
SYSTEM/FUNCTION/ACTIVITY Brakes					
CAUSE OF UNDESIRE EVENT 1) Stuck brake gasket (fails to release air pressure within tire RIM) 2) Binding of tire/Rim and/or tire braking system 3) Wheel comes off.					
EFFECT OF UNDESIRE EVENT Aircraft departs runway or paved taxi way and/or cartwheels and/or resulting in damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1a) See appropriate emergency procedures project document GTMP-2030. 1b) Utilizing off the shelf proven system 2) See appropriate emergency procedures project document GTMP-2030. 3a) Check/inspect wheels attachment prior to flight 3b) Use factory recommended installation					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage.			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
			NET RAC		2
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 024	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Structure of aircraft					
CAUSE OF UNDESIRE EVENT 1) Human error 2) Poor design 3) Structural/mechanical failure causes Hatch/Panel/Cover etc. coming completely or partially off in flight					
EFFECT OF UNDESIRE EVENT Damage to control surfaces <u>OR</u> damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1) Pre, and post-flight checks and procedures established for T1 (GTMP-2012) 2) Utilizing commercial off the shelf (COTS) parts . 3) Utilizing commercial off the shelf (COTS) parts .					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage.			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
		NET RAC		2	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 025		
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT LOC						
SYSTEM/FUNCTION/ACTIVITY Structure of aircraft						
CAUSE OF UNDESIRE EVENT 1) Poor design/structure flexure in-flight 2) Internal over pressure causes Hatch/Panel/Cover etc. coming completely or partially off in flight						
EFFECT OF UNDESIRE EVENT Damage to control surface(s) <u>OR</u> damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)						
CONTROLS/CORRECTIVE ACTION 1a) Load testing and stress analysis verified design is very robust and not likely to fail if there is a slight "shift" in connection points. GTMP-4004 1b) All hatches, panel, cover etc. are recessed and incorporate robust securing methods and do not require additional securing devices 2a) Attachment method capable of securing hatches at operating pressures						
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage.) Failure predicated by a pervious failure, air tank burst, fuel fumes ignition covered by hazards 15, 20 & 31. For covers (still attached or unattached) to impinge flight controls, gear etc. multiple failures must occur (no single point failure would cause hatches, panel, cover etc. to impinge on flight controls)			RISK ASSESSMENT*			
			SEVERITY		I	
			LOCAL HAZARD PROBABILITY/RAC		C	
			PRECEDING HAZARDS PROBABILITY			
			NET PROBABILITY			
		NET RAC		2		
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Date		Date		Date		
PIN		PIN		PIN		

FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 026		
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT LOC						
SYSTEM/FUNCTION/ACTIVITY Structure of aircraft						
CAUSE OF UNDESIRE EVENT 1) Mechanical/structural binding 2) Flight surface air overload (insufficient control authority) 3) Servo and/or linkage failure causes floating, jammed, inoperative flight control surface						
EFFECT OF UNDESIRE EVENT Damage to control surface(s) OR damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)						
CONTROLS/CORRECTIVE ACTION 1) Utilizing COTS parts 1) Perform high speed/low speed taxi testing (with flight control inputs) 2a) Utilizing COTS model, increased hinge size and main spar 2b) Airframe tested to over 4 G's planned experiments limited to 3.5 G's 3a) Using COTS R/C components 3b) Airframe tested to over 4 G's planned experiments limited to 3.5 G's						
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. 1) Utilize gradual systems checkouts during initial air worthiness test flights 3) T1 airframe flew with no issues 3) Servo failure in neutral of floating position would create reduced controllability 3) Servo failure in extreme or surface max deflection would create severe controllability issues			RISK ASSESSMENT*			
			SEVERITY		I	
			LOCAL HAZARD PROBABILITY/RAC		C	
			PRECEDING HAZARDS PROBABILITY			
			NET PROBABILITY			
			NET RAC		2	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 027	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, I, L		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Structure of aircraft or Control System					
CAUSE OF UNDESIRE EVENT 1) Control system failure (receiver, pwr supply, etc.) 2) Controls flutter causes floating, jammed, inoperative flight control surface					
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1a) Using off the shelf R/C components 1b) Batteries checked prior to each flight 1c) See emergency procedures (GTMP-2030) 2a) Control surfaces light weight (no mass balancing required), and control slop removed from linkages 2b) Load testing conducted 2c) Simulator testing conducted for all flight maneuvers and experiments 2d) See appropriate emergency procedures (GTMP-2030)					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. Procedures developed to determine when flight termination is necessary (throttles idle, flaps down, gear down, pitch up) See project document GTMP-2030.			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
NET RAC		2			
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 028	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION T, L, G (taxi/abort)		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Control of vehicle (on ground or in-flight)					
CAUSE OF UNDESIRE EVENT 1) Loss of SA or crew coordination error leads to failure 2) Failure to follow normal/emergency procedure required in other hazards 3) Unforeseen failure or multiple failures that are not addressed					
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1) Crew prepared through training and simulation activities, as last resort terminate flight 2) Personnel trained to know and follow project standard operating processes and procedures 2) Personnel trained to know and follow project emergency procedures: (Abort, stall speeds, engine failure on takeoff, etc.) Engine Failure in Flight/Landing (approach) See project document GTMP-2030. 3) Crew training should give experienced crew, as last resort terminate flight					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. If aircraft deemed not controllable, will have throttles at idle to initiate flight terminate procedures (GTMP-2030) Crew (pilot & engineer) errors in handling normal procedures or ground/in-flight emergencies.			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
		NET RAC		2	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 029	
HAZARD (One hazard per page) Ground based accident			PHASE OF OPERATION G		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT T1 dropped or flight control surfaces damaged or fuel spill or uncontrolled release of energy (fire/explosion)					
SYSTEM/FUNCTION/ACTIVITY pre-flight: transportation, maintenance, setup, servicing					
CAUSE OF UNDESIRE EVENT 1) Ground crew handling (loading/unloading) 2) Preflight (flight control surfaces checks) 3) Servicing – Air, fuel, electrical					
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1) Utilize cradle/trailer etc. for transportation 1) Multiple training sessions on taxi-testing etc. 2) Developed step by step checklist for ground and preflight handling and checkout (GTMP-2067) 3) Developed servicing process, and emergency procedures address fire on deck etc. (GTMP-2067, GTMP-2030)					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. Engine is located internally (long inlets, and long exhaust), would be difficult for person to contact rotating portions of motor			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
		NET RAC		2	
PREPARED BY: (b) (6) Apr 27, 2009 Date		CHECKED BY AE: _____ Printed Name Signature _____ Date PIN _____		CHECKED BY ASO: _____ Printed Name Signature _____ Date PIN _____	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 030	
HAZARD (One hazard per page) Ground based accident			PHASE OF OPERATION G		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT T1 dropped or flight control surfaces damaged or fuel spill or uncontrolled release of energy (fire)					
SYSTEM/FUNCTION/ACTIVITY post-flight: transportation, maintenance, de-fueling, disassembly, servicing					
CAUSE OF UNDESIRE EVENT 1) Improper handling, servicing, maintenance 2) On deck emergencies (fire/explosion) 3) Starting (personnel, FOD, etc.)					
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)					
CONTROLS/CORRECTIVE ACTION 1) Post flight process developed for handling and inspection (GTMP-2067) 2a) Prior to flight; emergency equipment in position, personnel briefed on emergency procedures during preflight safety meeting 2b) Fuel system design prevents fume accumulation, small volumes, high kerosene flash point etc. 3a) Process checklist developed specifically for T1 engine starting (GTMP-2012) 3b) Ground procedures cover motor containment failure/danger areas, no service with engines turning etc. (GTMP-2030) 3c) FOD Screen on engine intake					
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage.			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
		NET RAC		2	
PREPARED BY: (b) (6) Apr 27, 2009 Date		CHECKED BY AE: _____ Printed Name _____ Signature PIN _____ Date		CHECKED BY ASO: _____ Printed Name _____ Signature PIN _____ Date	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 031		
HAZARD (One hazard per page) Uncontrolled release of energy			PHASE OF OPERATION		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT Fire and/or explosion						
SYSTEM/FUNCTION/ACTIVITY Maintenance, storage, handling.						
CAUSE OF UNDESIRE EVENT 1) Ignition of kerosene fumes and/or power max (propane) etc. 2) Over pressure air system/damage in compressed air components						
EFFECT OF UNDESIRE EVENT Personnel injury/death <u>OR</u> damage to property in operations area <u>OR</u> damage to or loss of T1						
CONTROLS/CORRECTIVE ACTION 1) Utilize off the shelf fueling/de-fueling and engine components with long history of safe operation 1) Utilizing normal processes and emergency procedures for operations (GTMP-2030) 1) Emergency equipment available on-site and personnel briefed/trained in handling/use 1) High flash point of model fuel 2) Utilizing off the shelf air system components with long history of safe operation, and minimal system energy (small bottles, limit pressures) 2) Utilizing normal processes and emergency procedures for operations (GTMP-2030)						
REMARKS/ADDITIONAL INFORMATION Procedures checklist developed with crew monitoring to reduce the probability of human error and to provide mitigations Emergency countermeasures in place and professional firefighters and rescue personnel on standby. (Medical access, fire equipment etc.) Procedures call for pre-brief and coordination with facility fire and rescue.			RISK ASSESSMENT*			
			SEVERITY		I	
			LOCAL HAZARD PROBABILITY/RAC		D	
			PRECEDING HAZARDS PROBABILITY			
			NET PROBABILITY			
			NET RAC		3	
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				Date		

FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 032		
HAZARD (One hazard per page) Uncontrolled release of debris or energy			PHASE OF OPERATION G, T, L, M		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT Unconfined turbine motor/blade failure and/or fire and/or explosion						
SYSTEM/FUNCTION/ACTIVITY Turbine engine operations						
CAUSE OF UNDESIRE EVENT 1) FOD ingestion 2) Exceed engine RPM limits, over stress of engine components 3) Mechanical Failure of turbine blades/components/housing (inadequate design/poor fab. or installation or inspection)						
EFFECT OF UNDESIRE EVENT Personnel injury/death <u>OR</u> damage to property in operations area <u>OR</u> damage to or loss of T1						
CONTROLS/CORRECTIVE ACTION 1a) FOD inspection prior to engine start & flight (GTMP-2003) 1b) FOD screen on engine intake 2a) Utilizing off the shelf engine components with long history of safe operation 2b) Preflight motor inspections and proper servicing (oil etc.) 2c) Utilizing normal processes and emergency procedures (GTMP-2030) 3a) Utilizing off the shelf engine components with long history of safe operation 3b) Preflight motor inspections and proper servicing (oil etc.) 3c) Utilizing normal processes and emergency procedures (GTMP-2030)						
REMARKS/ADDITIONAL INFORMATION 1) Personnel trained to avoid danger areas when motors are turning (GTMP-2050) Utilizing normal processes and emergency procedures (GTMP-2030) Emergency countermeasures in place and professional firefighters and rescue personnel on standby. (Medical access, fire equipment etc.) Procedures call for pre-brief and coordination with facility fire and rescue.			RISK ASSESSMENT*			
			SEVERITY		I	
			LOCAL HAZARD PROBABILITY/RAC		D	
			PRECEDING HAZARDS PROBABILITY			
			NET PROBABILITY			
		NET RAC		3		
PREPARED BY: (b) (6) Apr 27, 2009 Date		CHECKED BY AE: _____ Printed Name _____ Signature PIN _____ Date		CHECKED BY ASO: _____ Printed Name _____ Signature PIN _____ Date		
				CLOSED OUT BY ASRB: _____ Printed Name _____ Signature PIN _____ Date		

FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 033	
HAZARD (One hazard per page) Personnel injured/killed			PHASE OF OPERATION T, L, F,		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Aircraft hitting project personnel					
SYSTEM/FUNCTION/ACTIVITY Flight Operations					
CAUSE OF UNDESIRE EVENT Uncontrolled aircraft trajectory (following loss of thrust during TO/LDG or in-flight and/or LOC)					
EFFECT OF UNDESIRE EVENT Project personnel injury/death					
CONTROLS/CORRECTIVE ACTION 1) Procedures & training call for personnel to be located eliminating or sig. reducing probability of being hit during phases of flight, T/O & Ldg (GTMP-2012) 1) Aircraft operating area in remote locations shall be pre-defined to ensure personnel are not in aircraft splash pattern 1) Automatic or aircrew initiated flight termination systems available (throttles to idle, rudder hard over) 1) Team shall perform review of operating area to ensure splash area and personnel safety. 1) Team shall calculate worst case scenario based on max operating altitude, air speed. 1) Fail-safe methods (throttles/rudder, etc...) will be tested prior to each flight					
REMARKS/ADDITIONAL INFORMATION This hazard covers injury, and covers a system or human error causing the aircraft potential to hit project personnel. hazards T1 - 001 through T1 - 012			RISK ASSESSMENT*		
			SEVERITY		I
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		C
			NET PROBABILITY		D
		NET RAC		3	
PREPARED BY: (b) (6) Apr 27, 2009 Date		CHECKED BY AE: _____ Printed Name _____ Signature PIN _____ Date		CHECKED BY ASO: _____ Printed Name _____ Signature PIN _____ Date	
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FLIGHT RESEARCH HAZARD ANALYSIS	PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 034
HAZARD (One hazard per page) Uncontrolled flight		PHASE OF OPERATION T, I, L	ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT Hardware or software or power failure causes aircraft receiver not to enter fail-safe mode following loss of signal			
SYSTEM/FUNCTION/ACTIVITY Flight			
CAUSE OF UNDESIRE EVENT 1) Failure of receiver/servo battery 2) Failure of electrical conductors (any of 3) from receiver to fail-safe servo 3) Bad software load on receiver			
EFFECT OF UNDESIRE EVENT LOC resulting in damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)			
CONTROLS/CORRECTIVE ACTION 1) Receiver and servo ground testing conducted from single power supply. Drop in supply voltage (less than 4 volts) causes receiver to cease sending signal to servo, procedure call for no flight with voltage less than 7.3 volts with 1 amp load. The servo in turn floats (only forces are internal friction). Were this to occur in flight such that all servos float, (aircraft would not be trimmed up) which would result in rapid aircraft departure. 1) The failure of the receiver signal to be received by the engine control units causes the engines to secure automatically. 1) Batteries checked prior to flight. 2) Hardware testing showed that loss of any of the three wire connections to the servo resulted in the servo "floating". 3) Preflight procedures verify that receiver software load initiates fail-safe upon loss of transmitter signal (GTMP-2012)			
REMARKS/ADDITIONAL INFORMATION: Hazard does not address/include injury to personnel or collateral damage No flight operations over ground crew operations area. Simulation shows that aircraft is slightly unstable in spiral mode. Fail-safe mode is initiated by the receiver upon loss on Xmtr signal, receiver performs fail safe by: 1) Signaling the engine control units to drive the engines to idle, gear down, flaps down, pitch up. 1) Fail-safe commands stored in the onboard receiver		RISK ASSESSMENT*	
		SEVERITY	I
		LOCAL HAZARD PROBABILITY/RAC	D
		PRECEDING HAZARDS PROBABILITY	
		NET PROBABILITY	
		NET RAC	3
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 035		
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum	
UNDESIRE EVENT flight terminates in water						
SYSTEM/FUNCTION/ACTIVITY Flight						
CAUSE OF UNDESIRE EVENT 1) LOC 2) Engine failure 3) Failure to entry fail-safe mode following loss of signal 4) Operator error						
EFFECT OF UNDESIRE EVENT Damage to or loss of T1 (Hazard does not address/include injury to personnel or collateral damage.)						
CONTROLS/CORRECTIVE ACTION 1a) Health monitoring system onboard 1b) Fire Department briefed and on alert 1c) LOC addressed in hazards T1 – 007 through T1 – 012 2) Engine failure addressed in hazards T1 – 001 t through T1 – 006 3) Failure to enter fail-safe mode addressed in hazard T1 – 034 4a) Robust and sustained pilot training program, from trainer aircraft to advanced jets. Pilot training document (GTMP-8002). Engine failure in-flight (GTMP -2030) 4b) Robust pilot training program covering in-flight emergencies. (GTMP-8002)						
REMARKS/ADDITIONAL INFORMATION Hazard does not address/include injury to personnel or collateral damage. LOC: T1 – 007 through T1 – 012 preceding hazards probability C & D Engine failure: T1 – 001 t through T1 – 006 preceding hazards probability C & D Failure to enter fail-safe mode following loss of signal T1 – 034 preceding hazard probability D			RISK ASSESSMENT*			
			SEVERITY		I	
			LOCAL HAZARD PROBABILITY/RAC		C	
			PRECEDING HAZARDS PROBABILITY		C	
			NET PROBABILITY		D	
		NET RAC		3		
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 036	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Research Station (Laptop Computer)					
CAUSE OF UNDESIRE EVENT 1) Loss of Shore Power 2) Loss of Battery Power Resulting in inadequate data to maintain Research Pilot situational awareness and ability to maintain controlled flight					
EFFECT OF UNDESIRE EVENT No Damage to T1 (No hazard to personnel.)					
CONTROLS/CORRECTIVE ACTION 1 & 2) Research system is passive and has no adverse effect 1 & 2) Pilot does not require Altitude or Air Speed to land aircraft					
REMARKS/ADDITIONAL INFORMATION			RISK ASSESSMENT*		
			SEVERITY		IV
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
			NET RAC		3
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 037	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Research Station (Laptop Computer)					
CAUSE OF UNDESIRE EVENT 1) Hardware system failure flight control components (D-space) 2) Software system failure flight controls causing monitor screen goes blank, freezes, information not legible					
EFFECT OF UNDESIRE EVENT No damage to T1 (No hazard to personnel.)					
CONTROLS/CORRECTIVE ACTION 1 & 2) Research system is passive and has no adverse effect 1 & 2) Pilot does not require Altitude or Air Speed to land aircraft					
REMARKS/ADDITIONAL INFORMATION			RISK ASSESSMENT*		
			SEVERITY		IV
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
			NET RAC		3
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 038	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Research Station (Laptop Computer)					
CAUSE OF UNDESIRE EVENT 1) Hardware system failure flight display components 2) Software system failure flight display components causing monitor screen goes blank, freezes, information not legible					
EFFECT OF UNDESIRE EVENT No damage to T1 (No hazard to personnel.)					
CONTROLS/CORRECTIVE ACTION 1 & 2) Research system is passive and has no adverse effect 1 & 2) Pilot does not require Altitude or Air Speed to land aircraft					
REMARKS/ADDITIONAL INFORMATION			RISK ASSESSMENT*		
			SEVERITY		IV
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
			NET RAC		3
PREPARED BY: (b) (6) Apr 27, 2009 Date		CHECKED BY AE: _____ Printed Name _____ Signature PIN _____ Date		CHECKED BY ASO: _____ Printed Name _____ Signature PIN _____ Date	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 039	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Research Station (Laptop Computer)					
CAUSE OF UNDESIRE EVENT 1) Software system failure AND software system failure flight display components causing monitor screen goes blank, freezes, information not legible					
EFFECT OF UNDESIRE EVENT No damage to T1 (No hazard to personnel.)					
CONTROLS/CORRECTIVE ACTION 1a) Research system is passive and has no adverse effect 1b) Pilot does not require Altitude or Air Speed to land aircraft					
REMARKS/ADDITIONAL INFORMATION			RISK ASSESSMENT*		
			SEVERITY		IV
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 040	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Research Station (Laptop Computer)					
CAUSE OF UNDESIRE EVENT 1) Network data over run/under run by processing computers causing monitor screen goes blank, freezes, information not legible					
EFFECT OF UNDESIRE EVENT No damage to T1 (No hazard to personnel.)					
CONTROLS/CORRECTIVE ACTION 1a) Research system is passive and has no adverse effect 1b) Pilot does not require Altitude or Air Speed to land aircraft					
REMARKS/ADDITIONAL INFORMATION			RISK ASSESSMENT*		
			SEVERITY		IV
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
		NET RAC		3	
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 041	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Research Telemetry system					
CAUSE OF UNDESIRE EVENT 1) Researchers Ground Transmitter hardware unit fails <u>OR</u> Researchers Ground Receiver hardware unit fails causing Loss of Research Telemetry system data link					
EFFECT OF UNDESIRE EVENT No damage to T1 (No hazard to personnel.)					
CONTROLS/CORRECTIVE ACTION 1a) Research system is passive and has no adverse effect 1b) Pilot does not require Altitude or Air Speed to land aircraft					
REMARKS/ADDITIONAL INFORMATION			RISK ASSESSMENT*		
			SEVERITY		IV
			LOCAL HAZARD PROBABILITY/RAC		D
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
			NET RAC		3
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 042	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Research Telemetry system					
CAUSE OF UNDESIRE EVENT 1) On-board aircraft Research Transmitter hardware unit fails <u>OR</u> on-board aircraft Research Receiver hardware unit fails causing Loss of Research Telemetry system data link					
EFFECT OF UNDESIRE EVENT No damage to T1 (No hazard to personnel.)					
CONTROLS/CORRECTIVE ACTION 1a) Research system is passive and has no adverse effect 1b) Pilot does not require Altitude or Air Speed to land aircraft					
REMARKS/ADDITIONAL INFORMATION			RISK ASSESSMENT*		
			SEVERITY		IV
			LOCAL HAZARD PROBABILITY/RAC		D
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
			NET RAC		3
PREPARED BY:		CHECKED BY AE:		CHECKED BY ASO:	
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		Date		Date	

FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 043	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Research Telemetry system					
CAUSE OF UNDESIRE EVENT 1) Loss of GPS link <u>OR</u> GPS unit fails <u>OR</u> Flight Data Control unit (FCU) fails causing Loss of Research Telemetry system data link					
EFFECT OF UNDESIRE EVENT No damage to T1 (No hazard to personnel.)					
CONTROLS/CORRECTIVE ACTION 1a) Research system is passive and has no adverse effect 1b) Pilot does not require Altitude or Air Speed to land aircraft					
REMARKS/ADDITIONAL INFORMATION			RISK ASSESSMENT*		
			SEVERITY		IV
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
			NET RAC		3
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FLIGHT RESEARCH HAZARD ANALYSIS		PROGRAM: Airborne Subscale Transport Aircraft Research AirSTAR – T1		HAZARD ANALYSIS # T1 - 044	
HAZARD (One hazard per page) Crash			PHASE OF OPERATION I		ANALYSIS IS: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Addendum
UNDESIRE EVENT LOC					
SYSTEM/FUNCTION/ACTIVITY Research Telemetry system					
CAUSE OF UNDESIRE EVENT 1) Research Antenna failure					
EFFECT OF UNDESIRE EVENT No damage to T1 (No hazard to personnel.)					
CONTROLS/CORRECTIVE ACTION 1a) Research system is passive and has no adverse effect 1b) Pilot does not require Altitude or Air Speed to land aircraft					
REMARKS/ADDITIONAL INFORMATION			RISK ASSESSMENT*		
			SEVERITY		IV
			LOCAL HAZARD PROBABILITY/RAC		C
			PRECEDING HAZARDS PROBABILITY		
			NET PROBABILITY		
			NET RAC		3
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		Date		Date	
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Based on Form 273 Sheet 2 Risk Assessment Matrix there are:

21 Net RAC 2's

23 Net RAC 3's

(b) (6)

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