



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

April 4, 2018

YIP Simulator Test Plan

OPERATIONAL FACTORS

DCA17FA075

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A. ACCIDENT

Location: Ypsilanti, Michigan (MI)
Date: March 8, 2017
Time: 1452 EST (1652Z)
Airplane: MD-83, N786TW

B. SUMMARY

On March 8, 2017, about 1452 EST, Ameristar Air Cargo Inc. flight 9363, a Boeing MD-83, N786TW, ran off the end of runway 23L after executing a rejected takeoff at Willow Run Airport (YIP), Ypsilanti, Michigan. All 109 passengers and 7 crewmembers evacuated the airplane via emergency escape slides. One passenger was reported to have received a minor injury. The airplane sustained substantial damage (no postcrash fire occurred). The airplane, which had been flown to YIP 2 days before the accident, was operating under the provisions of 14 *Code of Federal Regulations* (CFR) Part 121 as an on-demand charter flight and was destined for Washington Dulles International Airport (IAD), Dulles, Virginia. Daytime visual meteorological conditions prevailed at the time of the accident.

C. SIMULATOR TEST PLAN

1.0 Simulator Setup

Location: American Airlines Training Center, Dallas TX
Date: April 11, 2017

Time: 1330 – 1530 CST

Overall Objectives:

- Document simulator systems and alerts
- Document normal Ameristar taxi procedures
 - Include flight control check
- Document Ameristar Rejected Takeoff (RTO) procedures

Aircraft: MD-83 simulator (Level C)

Participants: Simulator Operator: Andreas Gruseus (Ameristar)
Captain (Left) Seat: Andreas Gruseus (Ameristar)
FO (Right) Seat: Pat Hulsey (Ameristar)
Test Conductor: David Lawrence (NTSB)
Observers: None¹

Note: Pat Hulsey was not qualified/current on the MD-83 for Ameristar. Since there was not a full qualified crew in the simulator, actual tests runs to document crew-related procedures for a rejected takeoff/emergency evacuation was not possible.

Initial Simulator Setup:

- New York LaGuardia (LGA)²
- Cockpit setup: Normal
- Weather: (See Appendix)
 - 10C temp, altimeter 29.80, winds 240/46, clear +10 visibility
- Left seat occupied by Andreas Gruseus, right seat occupied by Pat Hulsey
- Simulator motion disabled

Weight and Balance:

(See Appendix)

Zero Fuel Weight	114,476
Fuel Weight	31,000
Ramp Weight	145,476
Taxi burn	400
Takeoff Weight	145,076
CG (limits 3.7/22.1)	11.7
Stab Trim	7.0
Flaps	15
V1/Vr/V2 ³	139/142/150

¹ The FAA and Boeing Ops Group members were unable to attend.

² YIP airport was not in the simulator database. LGA was used for runway 22 and similar runway length to YIP 22R.

³ According to the crew interviews, they increased their rotation speed by about 5 knots due to the high winds at YIP.

2.0 Flight Control Check

Procedure

- Faced airplane to the north to simulate taxi to runway 27 at YIP, conducted flight control check.
- Conducted flight control check
 - a. Document procedure:
 - Normal procedure: aileron checked to the left then right, then control column full back, then full forward. While column is full forward, pilot looks for “elevator power on” light on overhead annunciator panel. There was no hydraulic pressure indications, no aural alerts. The power on light tells the crew that pressure was available to the elevator tabs. Aileron check was verified with the “spoiler deployed” light on the overhead annunciator panel. There was no hydraulic indication during this check.
 - Flight control check was part of the taxi checklist. There are no other flight control checks conducted by the pilots. The captain conducted the rudder check, and the FO (right seat) conducted the aileron and elevator check.
 - Inserted “Elevator Control Cables to R Elevator – Break” malfunction.⁴ Control check performed again with no noticeable difference in control column movement or resistance. All annunciator indications were identical to normal control check.

3.0 Rejected Takeoff Procedures

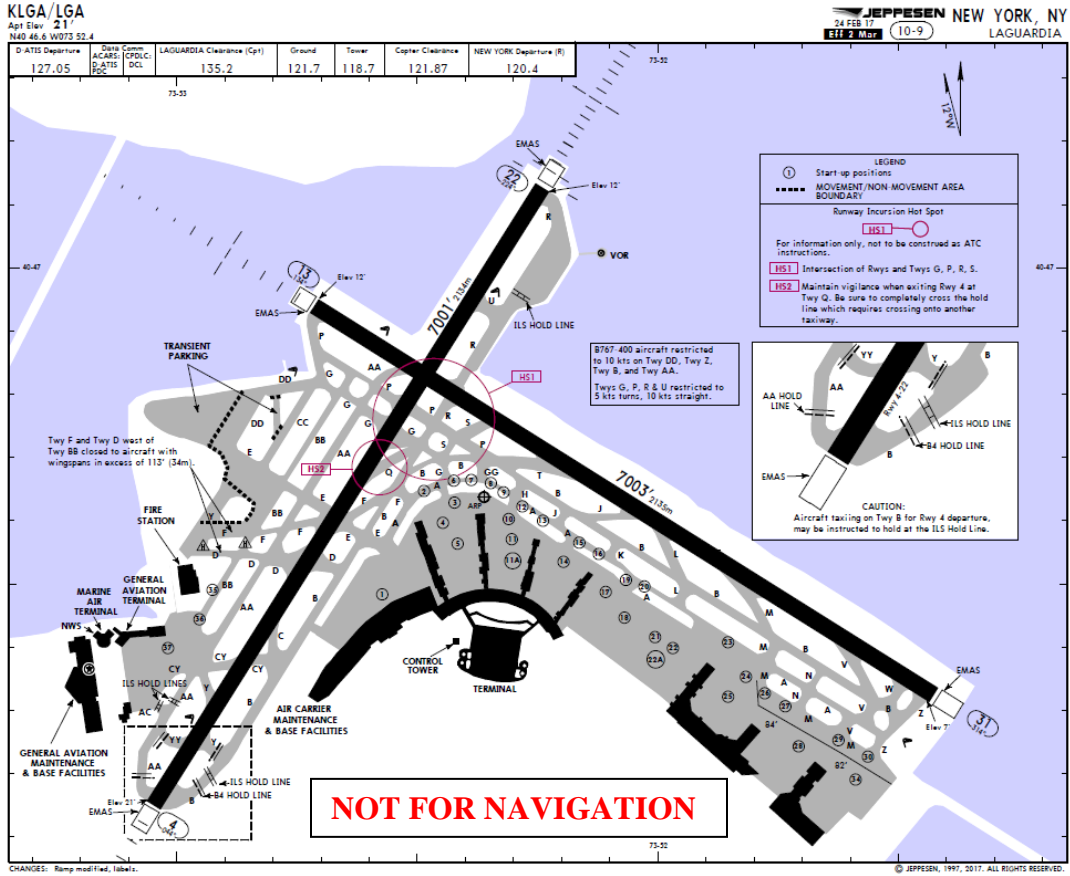
Procedure

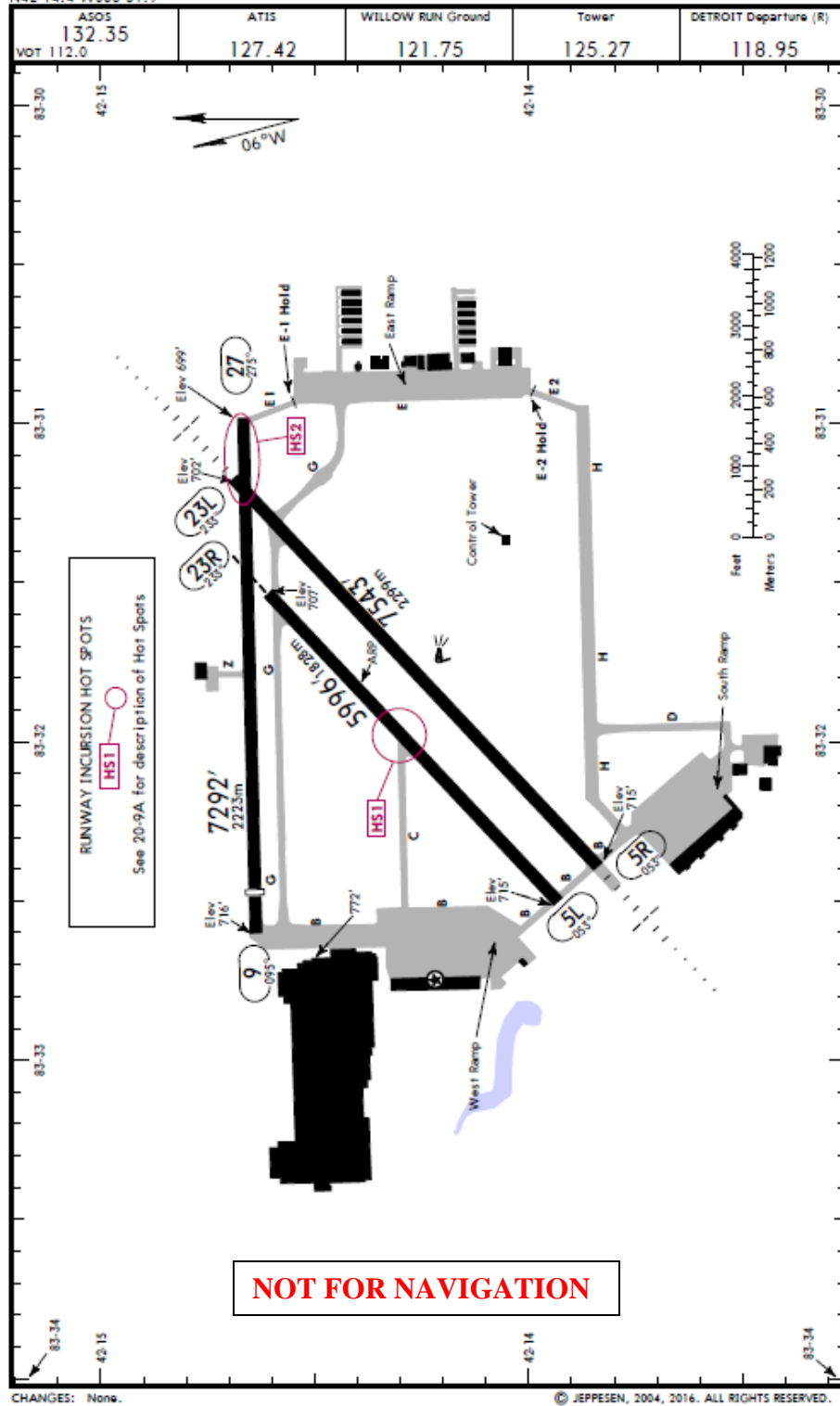
- Reposition airplane to end of runway 22 (LGA)
- Configured airplane (flaps 15, weights, weather)
- Pre-select Engine Fire (L or R) at 134 knots (purpose of run was to document the rejected takeoff procedures, not replicate the accident).
- Pilot performed rejected takeoff to full stop.
- Rejected takeoff made by pm, captain had hands on throttles for takeoff, removed hands at V1 call.
 - a. Pilot reduced thrust levers to idle, simultaneously disconnecting the autothrottles. According to the pilot, he initiated maximum braking as well.
 - b. Pilot then pulled on the ground spoilers lever full aft.
 - c. Pilot then initiated reverse thrust
- Ameristar procedures are to call “V1” at the actual V1 speed. Pilots do not call “V1” at V1-5 knots.

⁴ See Appendix for malfunction page.

D. APPENDIX

1.0 Charts





2.0 V-Speeds

MAX 1815 / 57.0

MD-83		08/15/10		JT8D-219	
Gross Weight		146,000 lbs.			
TAKEOFF			LANDING		
Use Airport Analysis for V Speeds and Corrections			FLAP SLAT	MIN MAN	
V1	<i>139</i>	0°/RET	248		
VR	<i>142</i>	0°/EXT	194		
V2	<i>150</i>	11°/EXT	169		
0/EXT	FLAPS 0-15 V2+5	15/EXT	167		
0/EXT	FLAPS 0-2 V2+15	28°/EXT	155		
0/RET	199	VREF 28°	144		
CLEAN		VREF 40°	140		
MIN MAN	248				
SE CLIMB 0/RET+20		219			

Ameristar Air Cargo, Inc.

3.0 Weather⁵

 * NON-GRAPHIC INFORMATION *

KYIP 081722Z 0818/0918 25032G48KT P6SM FEW060 FM082100 26031G46KT
 P6SM SCT070 FM082300 26024G36KT P6SM SKC FM090100 27014KT P6SM SKC
 FM090800 25008KT P6SM BKN150 FM091600 26008KT P6SM SCT060 OVC080=

METAR KYIP 081953Z A2980 RMK AO2 SLPNO \$=
 METAR KYIP 081853Z A2977 RMK AO2 SLPNO ?=
 METAR KYIP 081753Z A2979 RMK AO2 PK WND 24046/1656 SLPNO 58012 \$=

END 0004 WEATHER/NOTAM REPORTS 000 GRAPHIC 004 NON-GRAPHIC 000 NOTAM
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4.0 Weight and Balance

WEIGHT & BALANCE (maximum certificated weights in bold)	
Basic Operating Weight (+ crew weight)	87,304
Flight Attendant weight (4)	720
Passenger weight ⁶	21,450
Baggage/Cargo Weight	5.002

⁵ This weather was the observation at the time of the accident.

⁶ Weight was assumed 195 pounds each (winter weight) to include carry-on bags.

Zero Fuel Weight	114,476
Maximum Zero Fuel Weight	122,000
Fuel Weight (pounds)	31,000
Ramp Weight	145,476
Maximum Taxi Weight	161,000
Taxi Fuel Burn	400
Actual Takeoff Weight	145,076
Maximum Takeoff Weight ⁷ (landing limited)	146,400
Estimated Fuel Burn (IAD)	10,276
Estimated Weight on Landing (IAD)	134,800
Maximum Landing Weight	139,000
Takeoff CG (% of MAC) ⁸	11.7
CG Limits (FWD/AFT)	3.7/22.1
Stab Trim	7.0
Takeoff Flaps	15
V1/VR/V2 (146,000 pound card) ⁹	139/142/150
Landing VREF (40 degrees)	135

⁷ The maximum structural takeoff weight is 160,000 pounds.

⁸ Mean Aerodynamic Chord.

⁹ According to the crew interviews, they increased their rotation speed by 5 knots due to the high winds at YIP.

5.0 Ameristar Checklists

AMERISTAR AIR CARGO, INC.

DC-9 AIRCRAFT OPERATING MANUAL
NORMAL CHECKLISTS - AMPLIFIED
Revision: 25 02/01/17

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Normal Checklist MD-83

BEFORE START		AFTER START	
(F/O)	(CAPT)	(F/O)	(CAPT)
Briefing/EFB (B)	COMPLETED/SET	Pneumatic Crossfeeds	CLOSED
Logbook & Gear Pins	ON BOARD	Transponder	XPDR XPDR 1/2
Cockpit Preparations (B)	COMPLETED	Hydraulics	ON, HIGH & CHECKED
Preflight Inspection (B)	COMPLETED	APU Air Switch	OFF
Windows (B)	CLOSED /LOCKED	Engine Anti-Ice	ON/OFF
Circuit Breakers (B)	CHECKED	Fuel Heat	ON/OFF
Oxygen & Interphone (B)	CHKD, ON, 100%	Ignition	OFF
Smoke Goggles (B)	CHECKED	Electrical System	CHECKED
Pressurization	AUTO (up) and SET	Air Cond Supply Switches	AUTO
Air Cond Auto Shutoff	AUTO	Yaw Damper	ON
Anti-Skid	ARMED	Annunciators	CHECKED
EGPWS	TESTED	Shoulder Harness (B)	ON
FD CMD, CADC, EFIS & RADIO NAV Selectors	NORMAL	Ground Equipment (B)	CLEAR
EMER Lights	ARMED		
Seat Belt & No Smoking Signs	ON	TAXI	
Fit Guidance CtrI Pnl (B)	CHECKED & SET	(F/O)	(FO)
Clocks & Altimeters (B)	SET	Flaps/Slats (B)	° ° ° TO BLUE LT
FMS (B)	CHECKED & SET	Flight Controls/Elev Aug (B)	CHECKED
Engine Oil Quantity	CHECKED	APU	(CAPT) ON/OFF
Takeoff Warning	CHECKED	Fuel Heat	OFF
Rudder Power	POWER	Takeoff Briefing (B)	COMPLETED
Radar	OFF		
Transponder	STANDBY	BEFORE TAKEOFF	
Radios (B)	SET	(F/O)	(FO)
Rudder & Aileron Trim	FREE & ZERO	Flaps/Slats (B)	° ° ° TO BLUE LT
Parking Brakes	SET, PRESSURE CHECKED	V Speeds (B)	RECHKD
		Stab Trim (B)	SET
		Annunciators	CHECKED
		Flight Attendants	SEATED
Fuel Pumps & X Feed	ON & CLSD	Departure Runway (B)	CONFIRMED
Fuel Quantity (B)	MIN, FOB	Ignition	ON
V Speeds (B)	SET	Radar/EGPWS (Terrain Display)	ON
Stabilizer Trim (B)	CHECKED & SET	Transponder	TA/RA
PMS (B)	CHECKED & SET	Landing Lights	ON
		Runway Alignment (B)	CHECKED
READY FOR START			
(F/O)	(CAPT)		
Documents	ON BOARD		
Cabin	SECURE		
Cockpit Door	LOCKED		
Pneumatic Crossfeeds	OPEN		
Hydraulics	ON, HIGH & CHECKED		
Anti-Collision Lights	ON		
Annunciator/Door Lights	CHKD & LTS OUT		
Air Cond Supply Switches	OFF		
Fuel Pumps	SET		
Pitot/Windshield Heat	CAPT/ON		
Ignition	ON		
Pneumatic Pressure	CHECKED		

6.0 Photos (taken by Ops Group Chairman)

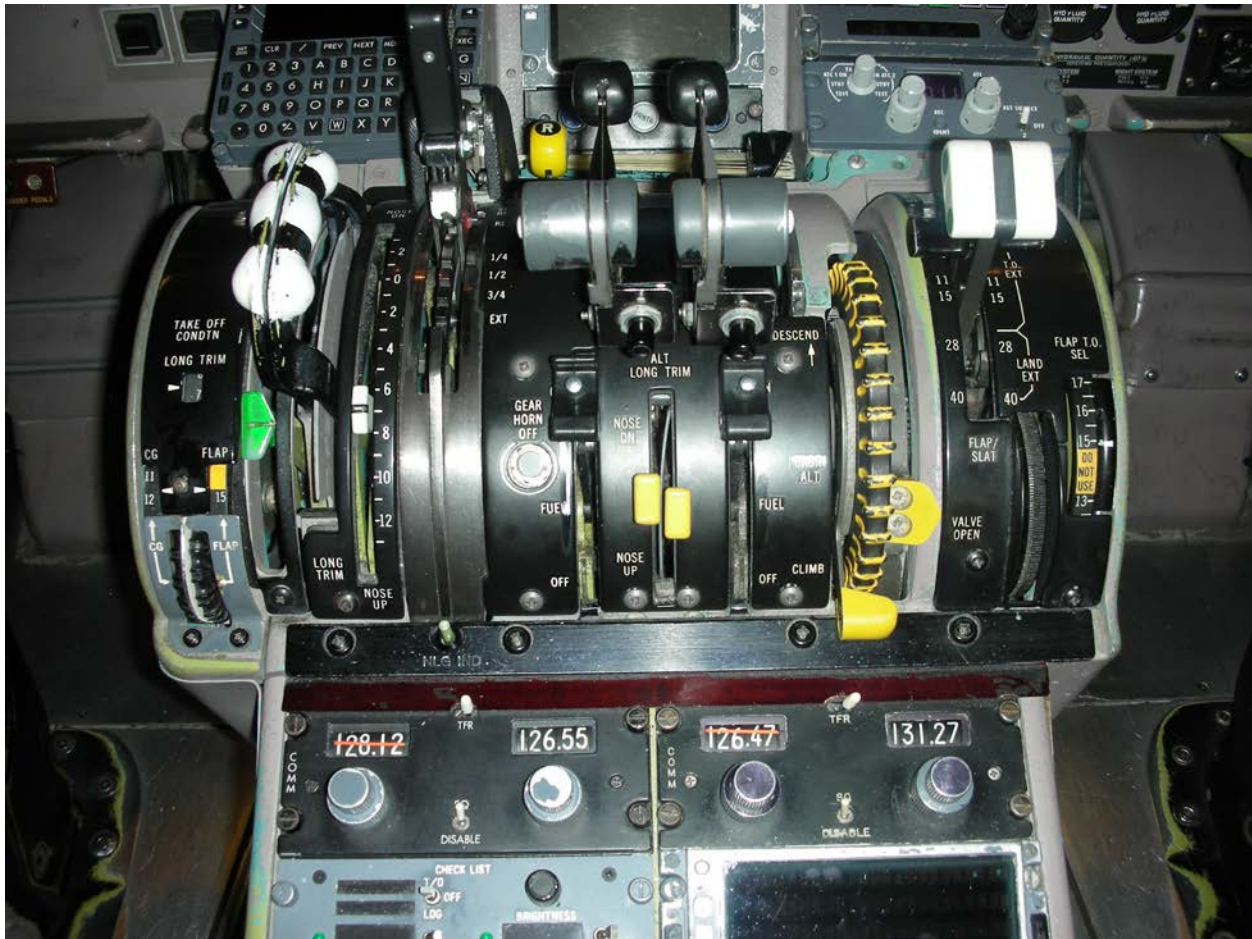


Photo 1: Center Quadrant set up for flight control check.



Photo 2: Fuel panel indications.

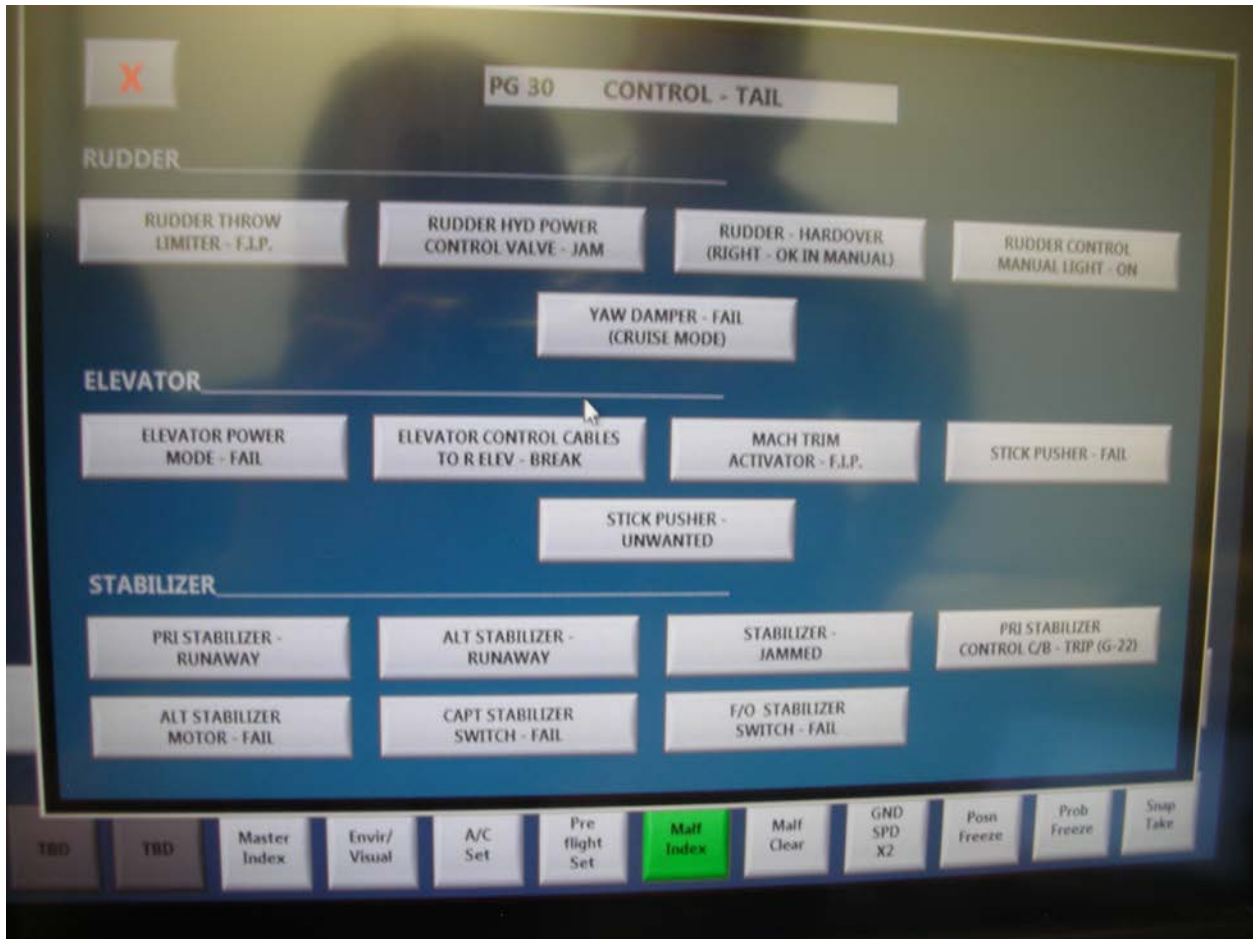


Photo 3: Simulator Malfunction Page (Control – Tail).



Photo 4: photo of control column full forward.



Photo 5: Overhead annunciator indications with control column full forward. “Elevator Pwr On” light indicated by arrow.