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The Law of Primacy and the Utility of a Jet Transition Course

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  - BS, Economics and Finance, Houston Baptist University
  - MA, Economics, University of Oklahoma
  - PhD (ABD), Aviation, ERAU
  - **Marine Corps Officer** (1988-2008)
    - Fixed and rotor wing aviator and instructor
    - Economics Instructor USNA (5 years)
  - **Pilot and Program Manager**, King Air, L-3, ISR, Iraq and Afghanistan (2008-2012)
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- **Assistant Professor** (tenured), School of Aviation, Jacksonville Univ. FL, 2011-Present.
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- **Total Flying time:** 27,700 hours.
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Abstract

Regional jet carriers have established Pilot Pathway Programs providing partnership opportunities with collegiate aviation programs in order to fashion pilot training at the undergraduate level. These partnerships provide aviation students early screening for employment with regional airlines and provide the university needed access to airline training material to fully prepare these students for success during regional jet carrier new hire training. One of the main issues with normal FAA recommended pilot training and licensing progression is the emphasis on single pilot operations. The regionals operate aircraft requiring a cockpit crew. The challenges of the transition to a multicrew environment are discussed. Deficiencies noted during regional jet carrier new hire training are also discussed, along with traditional undergraduate aviation curriculum. The design, benefits, and goal of a jet transition course will be presented.
Definitions

- **The Law of Primacy** (E. L. Thorndike):
  - ‘Primacy, the state of being first, often creates a strong, almost unshakable impression and underlies the reason an instructor must teach correctly the first time and the student must learn correctly the first time.’ (FAA 2009).

- Surfaces under times of stress or time compression.

- Example: SW 1380: Single frequency request from ATC.
Definitions (cont.)

- **Jet Transition Course** (JTC)
- No formal definition
- ‘A jet transition course should be a multi-faceted and seek to identify and lay the appropriate foundation for core competencies unique to air carrier and high altitude turbojet operations. In a non-regulatory environment, elements key to such foundations are broad, limitless, and often subject to the best interpretation, perception, and instinct of the person, authority, or agency questioned.’ (M. J. Hildebrandt, JetBlue Director Business Partner Training Standards).

Some limitations:

- Instructor experience
- Number of students in seats
- Student course load and continuity of training
Definitions (cont.)

- **Pilot Training:**
  - Single pilot (PIC) vs. Crew Concept (MPL)
- **Aircrew:**
  - Not just the other pilot. Include all resources.
- **Regional Airlines:**
  - The first Part 121 employer.
  - Train new hires to Restricted ATP standards.
  - Can provide guidance and materials for Jet Transition Course content.
Noted Deficiencies in Regional New Hires

- Automation Management and Appropriate Levels of Automation.
- Basic Flight Management System (FMS) Programming and Usage.
- Energy Management and Descent Planning.
- Applications of Threat and Error Management.
Addressing the Deficiencies

- Advanced Aircraft Systems II.
- Crew Resource Management.
- Advanced Systems III.
- Air Transport Operations for the Professional Pilot.
- High Altitude Aviation Physiology (Hyperbolic Chamber).
- Jet Transition Course.
The Law of Primary Applies to 4 Specific Elements of the JTC

1. Training Enhancement Strategies
2. Human-Systems Integration
3. Team Performance
4. Airspeed Calibration
1. Training Enhancement Strategies

- Sophisticated, high fidelity flight training devices (FTD) are on many campuses.
- Provides the student the optimum train-like-you fly environment.
- To capitalize on the law of primary, instructors must ensure that the training tools are **without error** in order to fully capture the initial training moment.
- The hardware and software elements of the FTD must be set to facilitate the training event **without flaw** for the law of primary to take effect.
- This includes: **Up to Date POH, QRH and Emergency Checklists**
  - Digital analysis of the simulation video and data flight replay
  - ATC Simulation
  - High Fidelity Visual Presentation of the External Environment
2. Human-Systems Integration

- The avionics and flight management systems of a modern jet transport are complicated.
- There are many ways to obtain the information or set up the displays for use.
- In this context, the law of primary may best be implemented in one word: standardization.
- In order to efficiently utilize the avionics and FMS, the student must learn how to operate the equipment correctly, the first time.

The JTC instructor can:
- Demonstrate the correct and most efficient ways to set up and use the systems
- Demonstrate how to correctly use these systems in a crew environment
3. Team Performance

- The effects of the law of primary culminate with the student learning how to combine the **training strategies** of the FTD with the newly acquired **automation management techniques**.

- In turn this creates a **synergistic relationship** with other crewmembers.

- Instructors can use synergy to demonstrate successful CRM and human factors strategies to include:
  - **Decision making** (now a shared responsibility and should be scenario-based)
  - **Situation awareness** and **workload management**
  - **Flight deck leadership** and **followership**
  - **Assertiveness** and **Advocacy**
  - **Communication**
  - **Professionalism**
  - **Checklist Management** and Accomplishment including **flows** and **profiles**
  - Division of Duties while maintaining **awareness of the aircraft flight path**
4. Airspeed Calibration

- Expanding student horizons from 150 to 400 knots and 5,000 to 35,000 feet.

- Applying the law of primary:
  - Present the student with canned flight profiles with specific airspeeds and altitudes to provide a benchmark.
  - Relate climb and descent speeds and profiles to demonstrate fuel efficiency and economic performance.
  - Demonstrate climb and descent profiles and relate to mileage (TOD planning).
  - Provide scenarios for implementation of speed calibration lessons (e.g. 250 kts. on downwind).


Jet Transition Course Laboratory

- The goal is **NOT** a rating in the aircraft.
- The goal **IS** to create an enlightened airline candidate who can embrace regional jet training, not be overwhelmed by the information presented and who can demonstrate good crew resource and threat and error management.

- Demonstrate **max. vs. optimum altitudes, high and low speed buffet, coffin corner, the proper use of speed brakes and deceleration procedures, energy management**.

- Demonstrate the importance of a **stabilized approach**.
- Demonstrate **automation dependency**.
- Practice crew handling of system **abnormal and emergency scenarios**.
- Demonstrate airline quality **briefings** with emphasis on **threats**.
- Recognize and **trap errors in a crew environment**
- Use the snapshot ability to recreate scenarios for corrective measures.
Law of Primacy Applications

- Checklist Management: NW 255, Palm 90
- Altitude Selection on MCP: Altitude Violations
- FMS usage: AA 965
- Mode Confusion: Air Inter 148
- Operation of speed brakes: AA 965
- Autopilot Operation/Monitoring: EA 401
- Crew response to abnormalities: EA401/ QA 32
- Descent planning formulas: Descent inefficiencies
- Attitude Instrument Flying: AF 447
- Basic Automation Dependency: AS 214, TK 1951
- Using Automation as an aid: AS 214

Checklist, QRH Correct Crew Accomplishment
Setting MCP with PM/PF verification
PM/PF verification and TLAR. WP verification
Correct mode for flight phase (v/s for climb?)
Speed brake position awareness (hand guard?)
Both pilots monitor autopilot. Who has controls?
‘You fly, I’ll fix’
Formula introduction: 3 to 1 etc.
Pitch, power, airspeed demos. w & w/o F/D
Always thinking ahead of the aircraft
Set up glide path guidance (300’/nm) and TLAR
And Finally

For the Law of Primacy to be utilized and implemented effectively:

The JTC Instructor should have Pt. 121 experience.

Questions?