

Links Between Documentation and Training
NASA/FAA Operating Documents Workshop V
July 25, 2002

KD Van Drie

Judgment:

Skills must be built over TIME

Training segments must be **consistent** and **build** on previously learned skills



challenge:

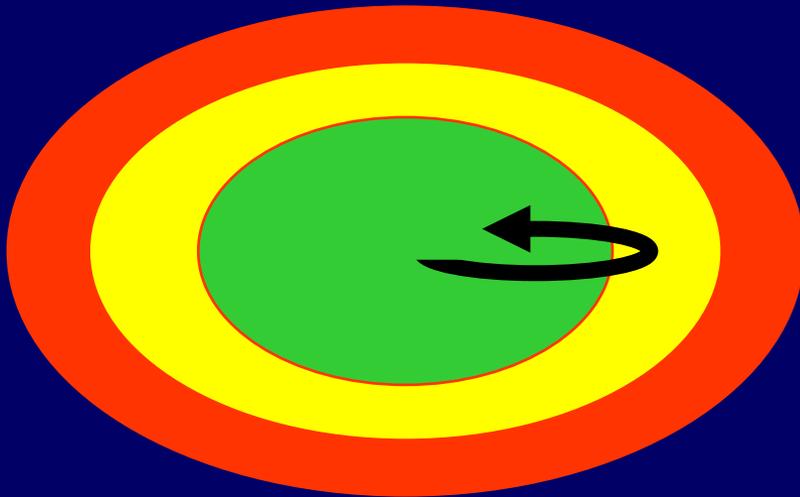
How do you Clearly communicate the vision

- Subject Matter Experts
 - Technical
 - Human Factors
 - Automation
- Operations Management
- Flight Management
- Curriculum Developers
- Media Technicians
- Ground School Instructors
- Simulator Instructors
- Evaluators
- Line Check Airmen
- Analysts
- Software Developers
- Supervisors
- Safety Personnel
- Technical Writers
- FAA
- Finance
- Upper management
- Unions
- other employee groups...

Task Loading Concept

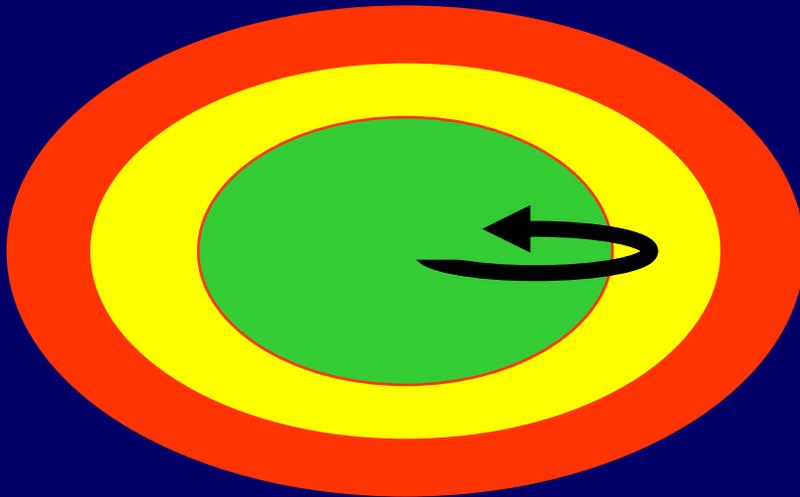
Simply...

$\frac{\text{Tasks}}{\text{Available Time}}$... task loading



“Potential for Error”

More errors are likely to occur
when heavily task loaded



Simply:

- **Green:** Errors may occur, but they will be caught
- **Yellow:** Errors may occur, but they may not be caught and may become cumulative
- **Red:** Errors will occur that are not caught

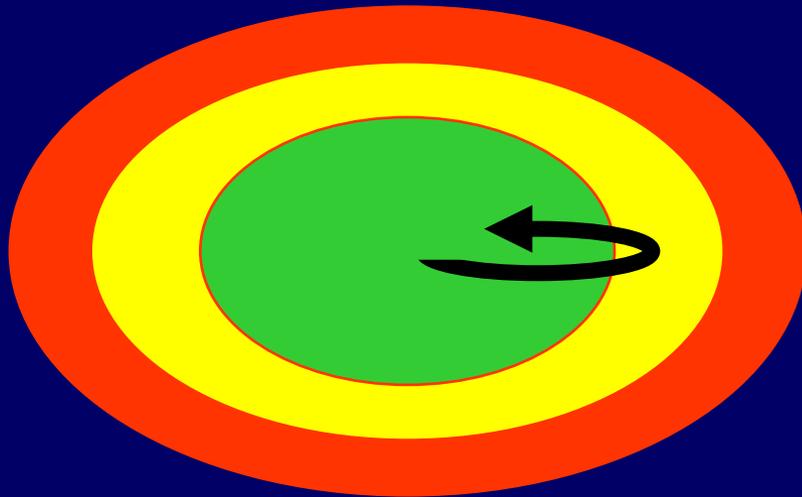
Task Loading

Task loading begins with the “job at hand”

For the pilot...

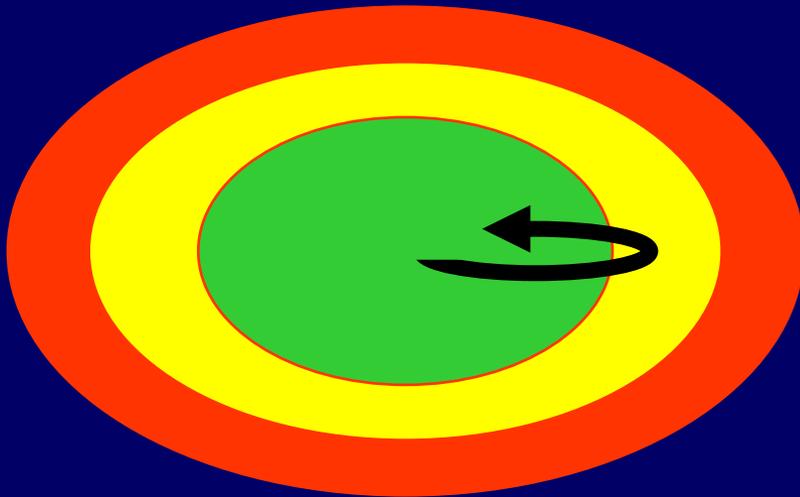
Different **Phases of Flight** have Different Task Loading

- Pre-departure
- Taxi
- Takeoff
- Climb
- Cruise
- Descent
- Approach
- Landing



Task Loading

Task Loading is increased by **Additive Conditions**



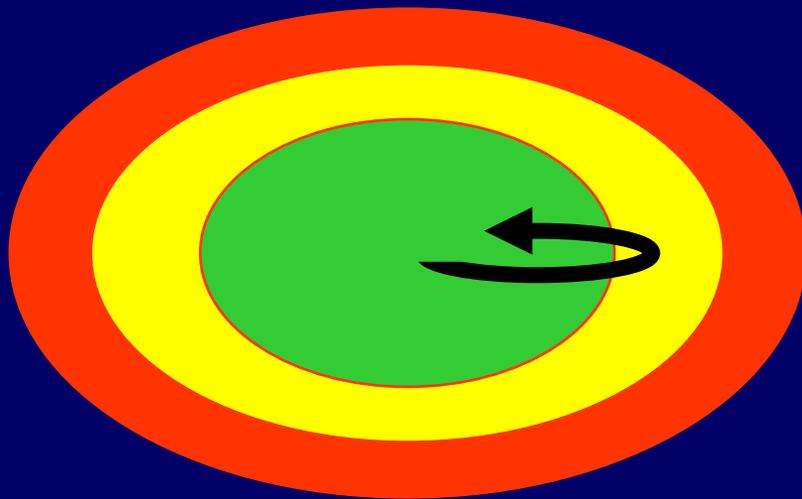
- ATC
- ICING WEATHER
- CONVECTIVE WEATHER
- LOW VISIBILITY WEATHER
- CREW FACTORS
- AIRCRAFT SYSTEM MALFUNCTION
- PASSENGER ISSUES
- HOLDING
- AIRCRAFT PERFORMANCE LIMITS
- AIRPORT FACTORS

Crew Factors

Crew Factors can increase potential for error

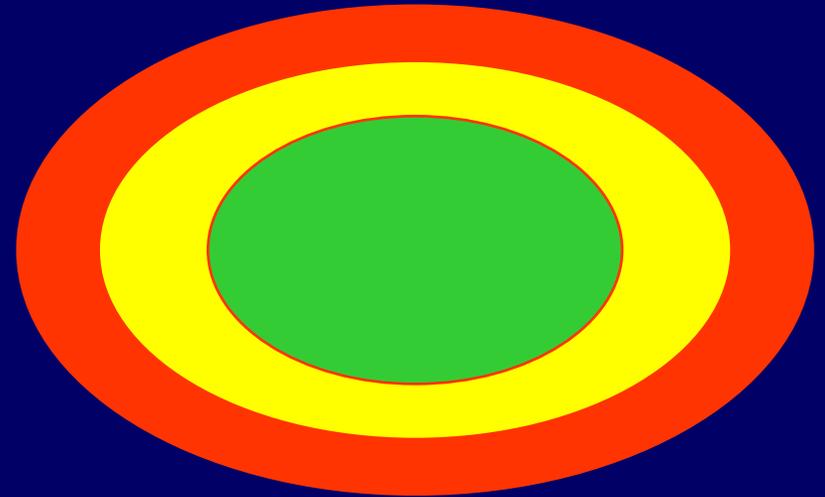
(Seven dwarf syndrome)

- Sleepy → Fatigue
- Grumpy → Stress
- Happy → Inattention
- Bashful → Assertiveness
- Doc... → Complacency



How does it work?

- Throughout the flight crews are encouraged to continually assess additive conditions

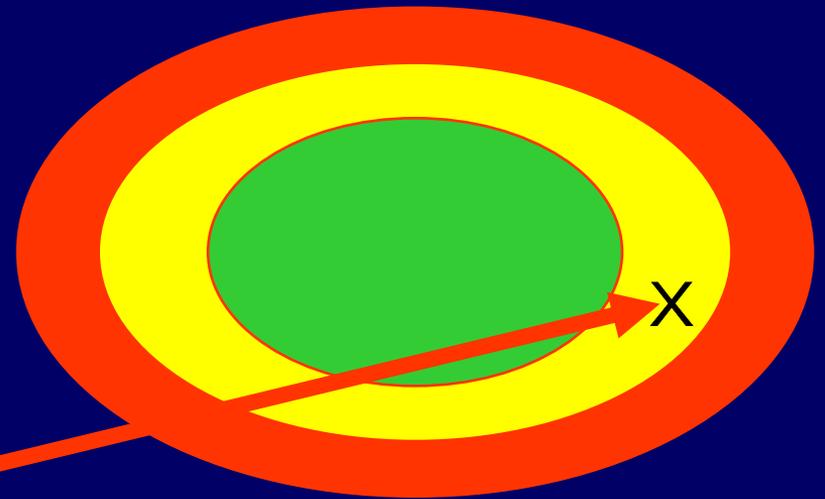


How does it work?



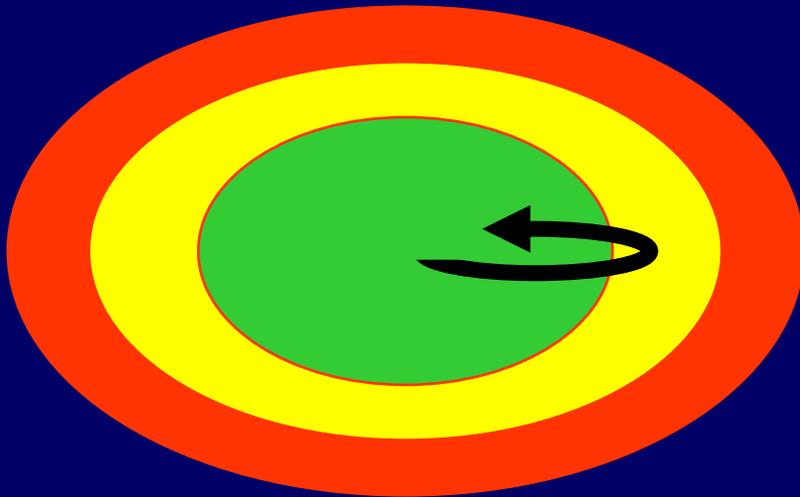
Captain's Pre-departure considerations...

- Moving to a new house
- Quick Call
- First flight of trip
- East Coast - Short Flights
- Some weather considerations
- New First Officer
- Pressurization MEL



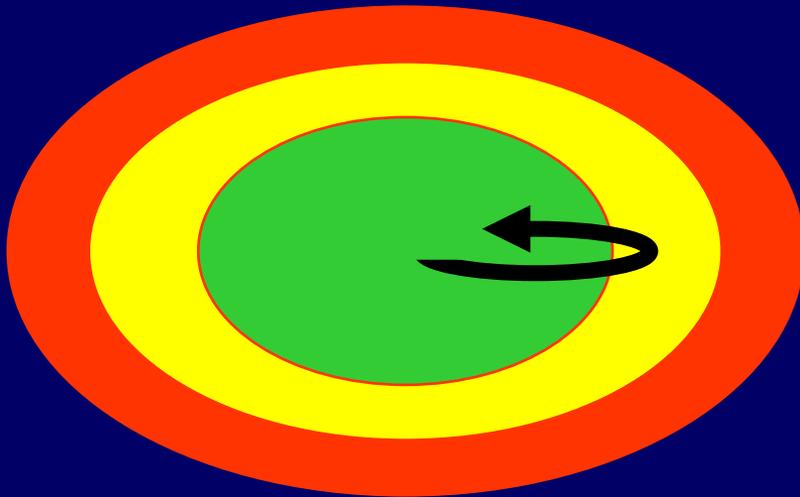
Self-diagnosis

- **Common Errors**
- **Consequential Errors**

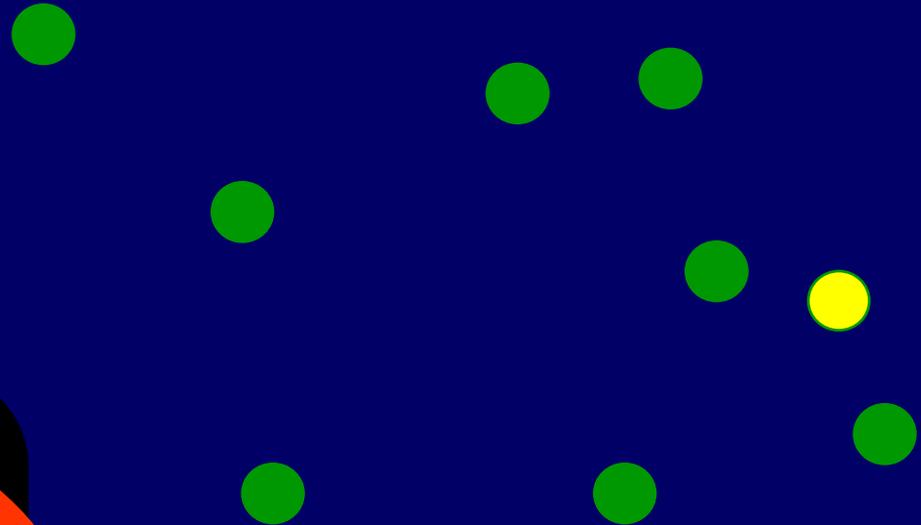
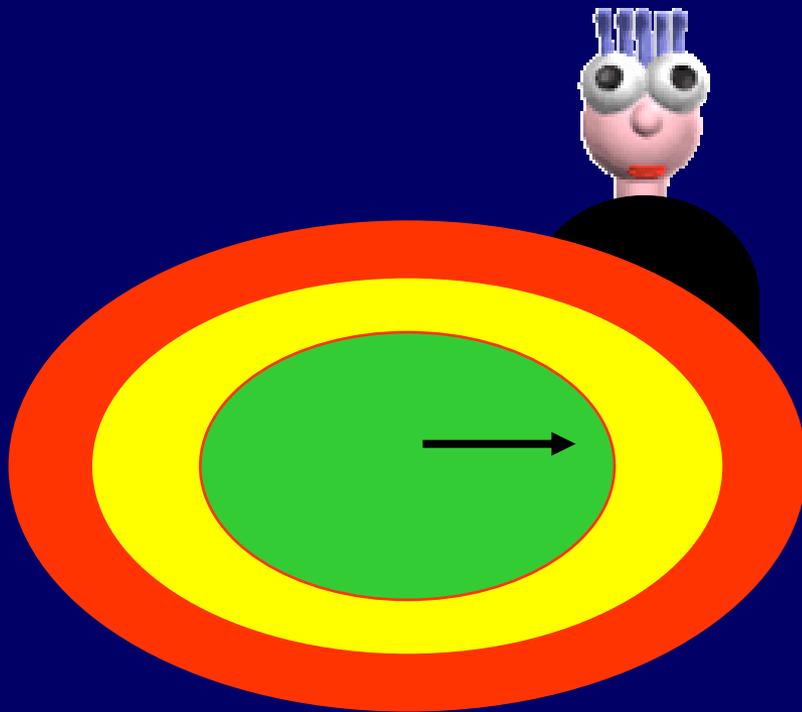


Self-diagnosis

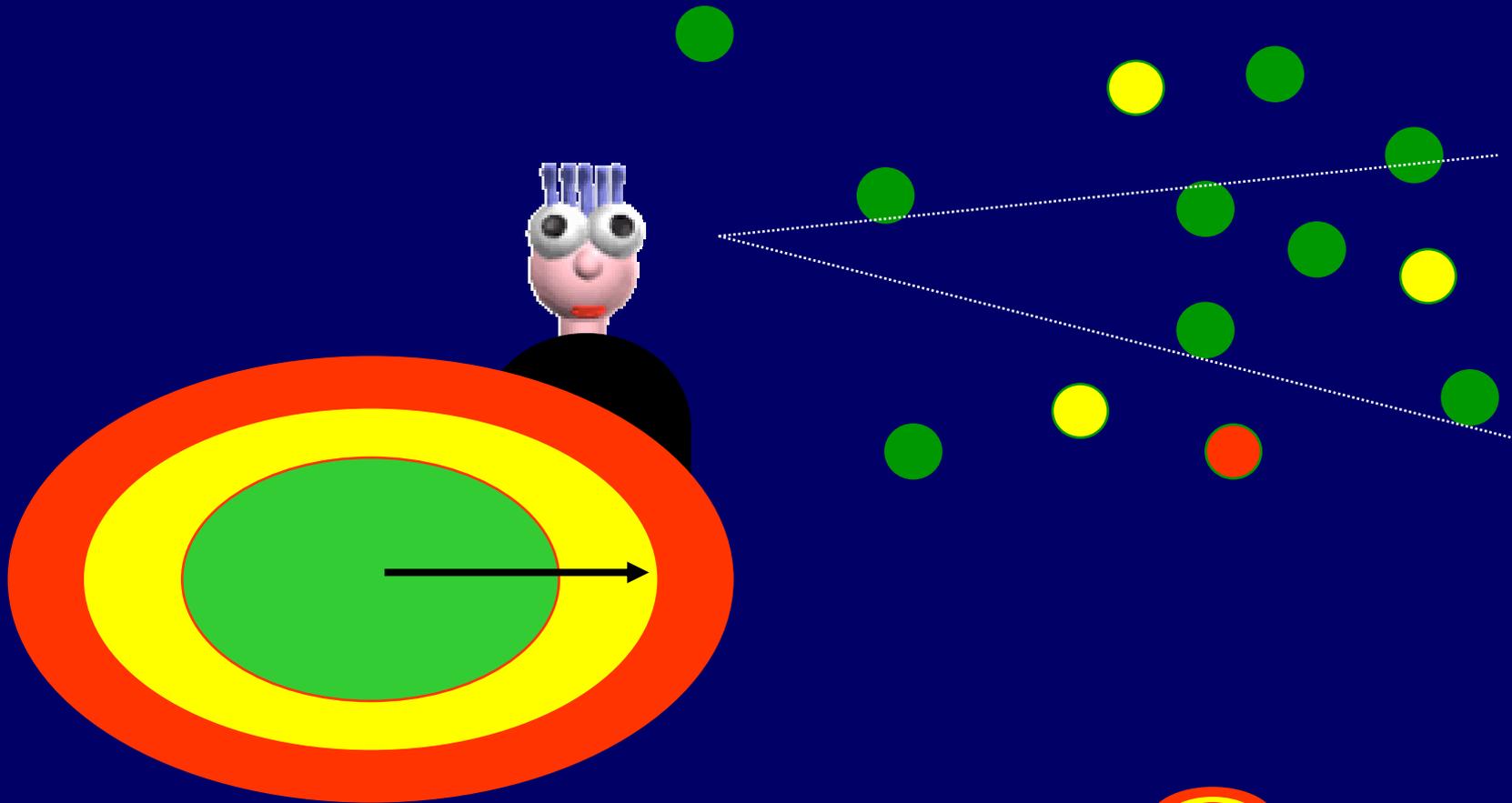
What is it like to “be in the **green**”
or “**yellow**”
or “**red**” ?



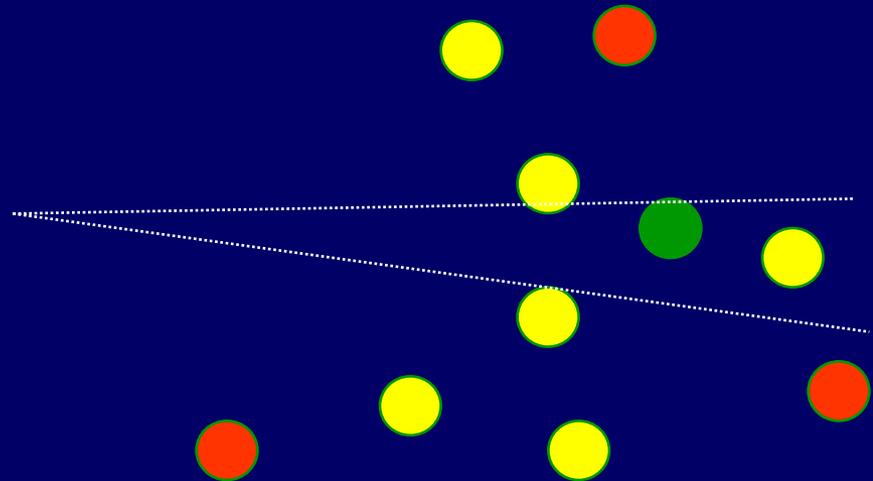
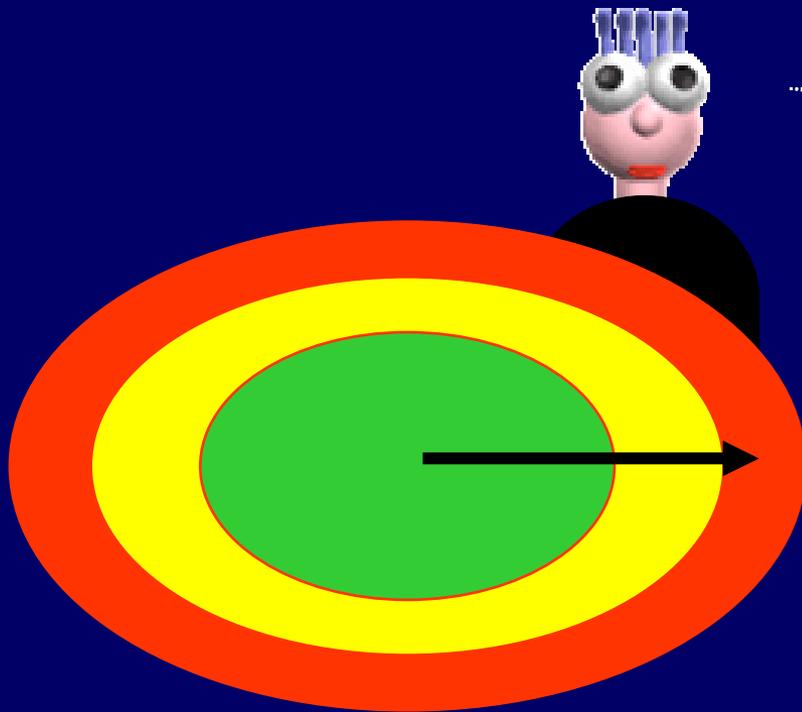
“In the Green”



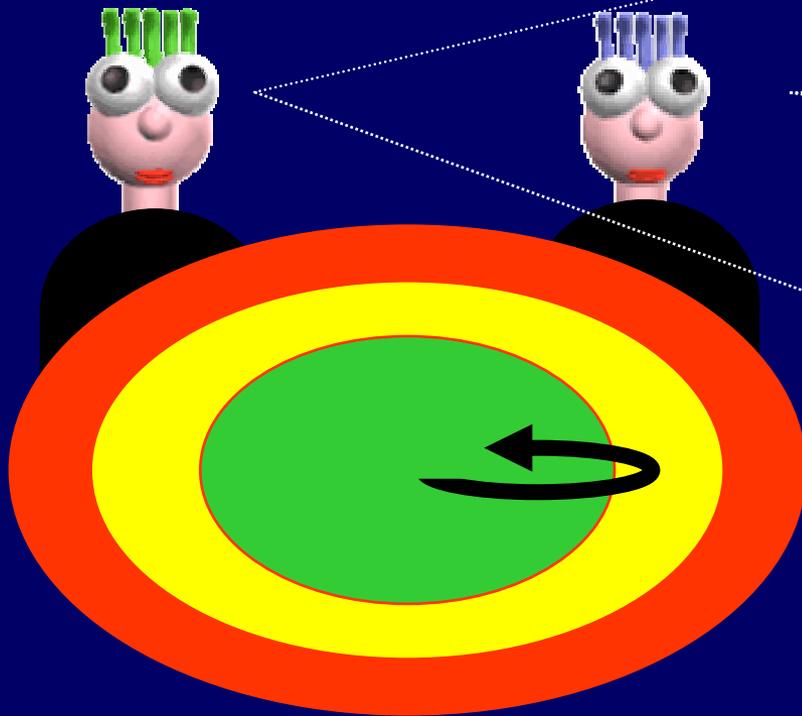
“In the Yellow”



“In the Red”



Getting it back to the green



What we know

- **Can't Eliminate Error**
- **Task Loading, Additive Conditions and Crew Factors** impact the “Potential for Error” (green, yellow, red)
- **Communication patterns/styles** change when in the green, yellow or red.

Resources to Reduce Risk

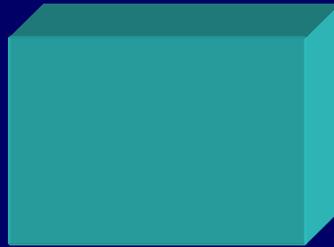
The Tools of the Trade



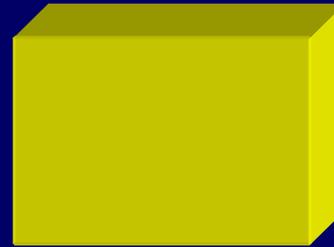
- Policies
- Procedures
- Flows



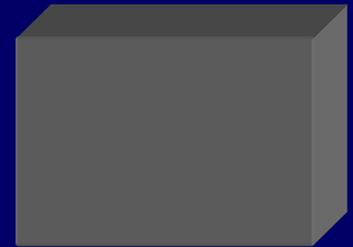
- Checklist
 - Do/verify
 - Read and Do



- Automation



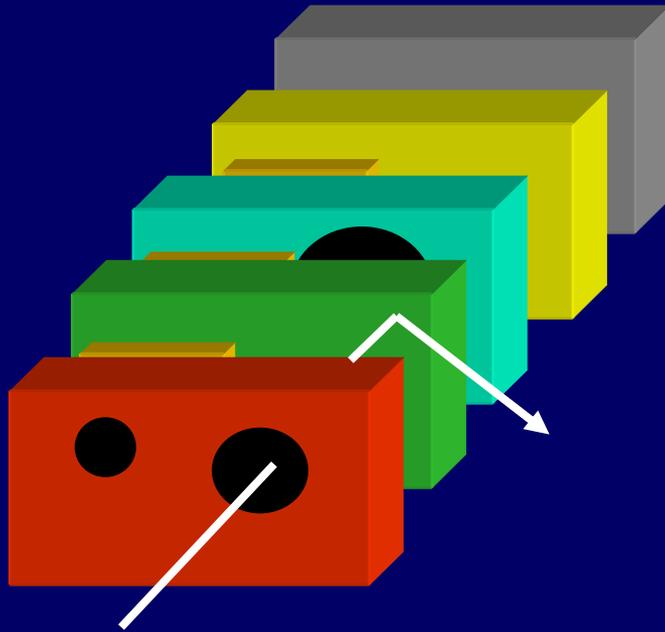
- Teamwork
& Human
Interaction



- Equipment
Handling

TASK MANAGEMENT SKILLS (TMS)

Use the skills...



- To reduce task loading
- To create redundancy to stop an error chain

Policies

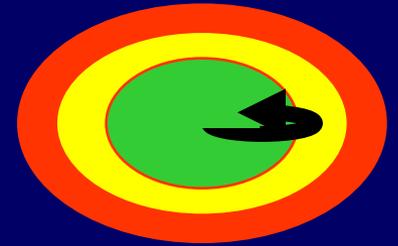


Policies,

Policies are guidance which

- **Expedite judgment**
- **Make decisions more consistent and predictable**

Procedures



Policies, Procedures

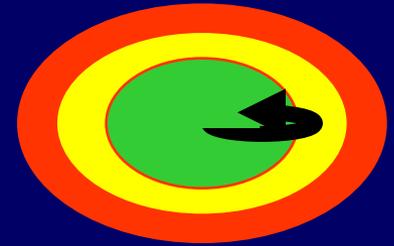
Procedures provide strict guidance within a known operating environment

- Reduces communication confusions
- Makes decisions faster and more predictable
- Allows us to accomplish a task even when “in the yellow”
- “Levels the playing field”... to accommodate diversity
- Enable us to break down complex jobs between employee groups

Avoiding “over Proceduralization”

- MUST have a known operating environment
- Also...
 - Time Critical Communications
 - Protect Equipment
 - Provide a standard product
 - Enhance cooperation between employee groups

Flows



Policies, Procedures, Flows

FLOWS

- Break down complex jobs into smaller tasks
- Do the same tasks in the **SAME ORDER** every time.
- **Major** reduction in task loading

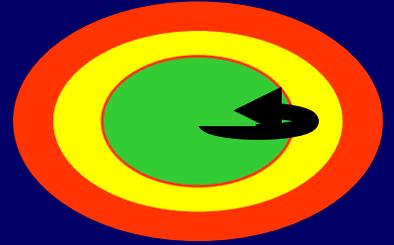
“Techniques”



Policies, Procedures, Flows (and Techniques)

Techniques

- Personalized by pilots
- Add extra layers of redundancy
- Two “Rules”
 - Must be compliant with existing PP&F
 - Must not interfere with other crew members



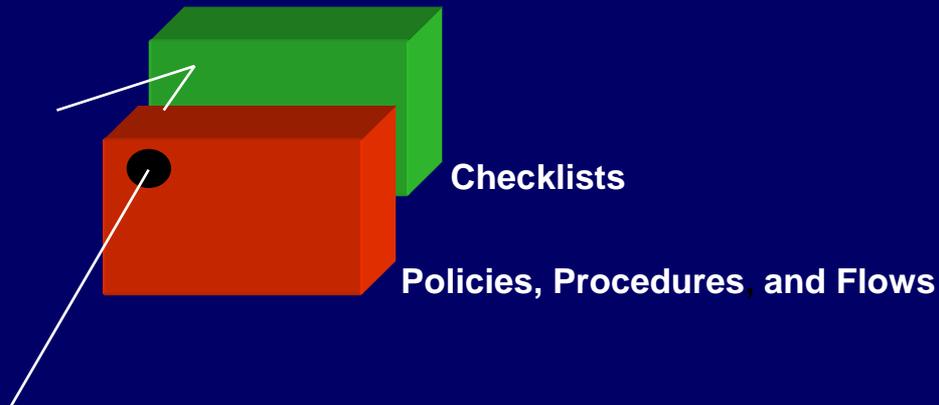
Policies, Procedures, Flows

Policies, Procedures and Flows Reduce task loading

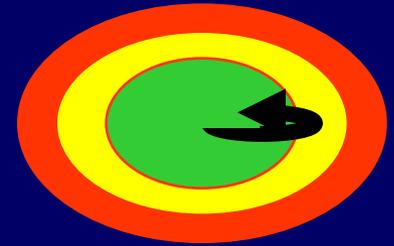
But they are not perfect!



Using a checklist as backup provides redundancy to catch errors



Errors are always possible...



Checklist provide a back-up (Do verify)



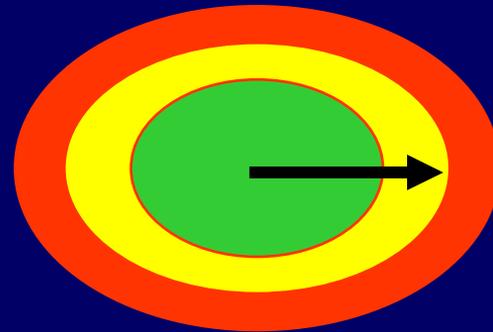
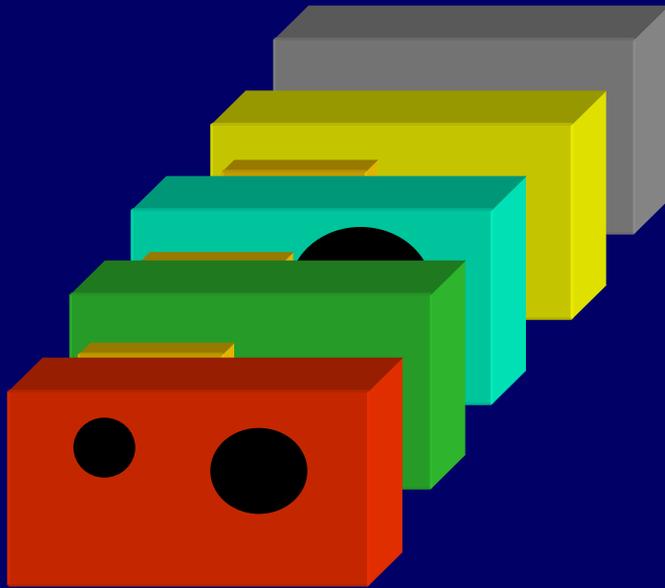
or

Checklist may be used as a reminder (Read and Do)

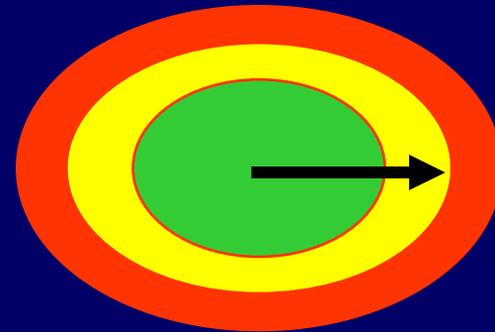
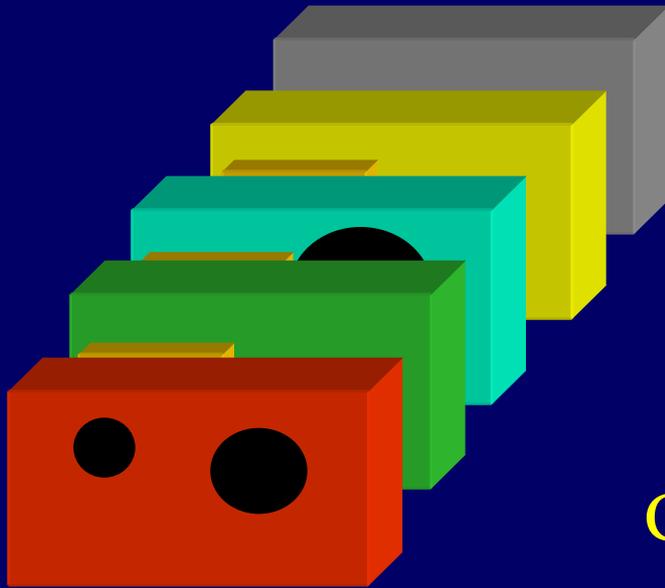
Impact of documentation on crew performance

Examples:

- QRH
- Loss of communication

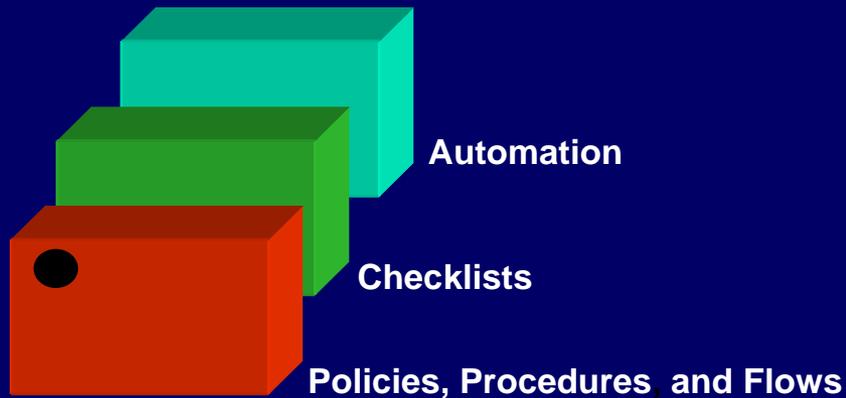


- These resources act as Barriers to Prevent and detect errors
- Used wisely, they prevent a “chain of errors” that can result in an unsatisfactory outcome



Crews must use judgement to
Balance use of Barriers with
Task Loading

Automation

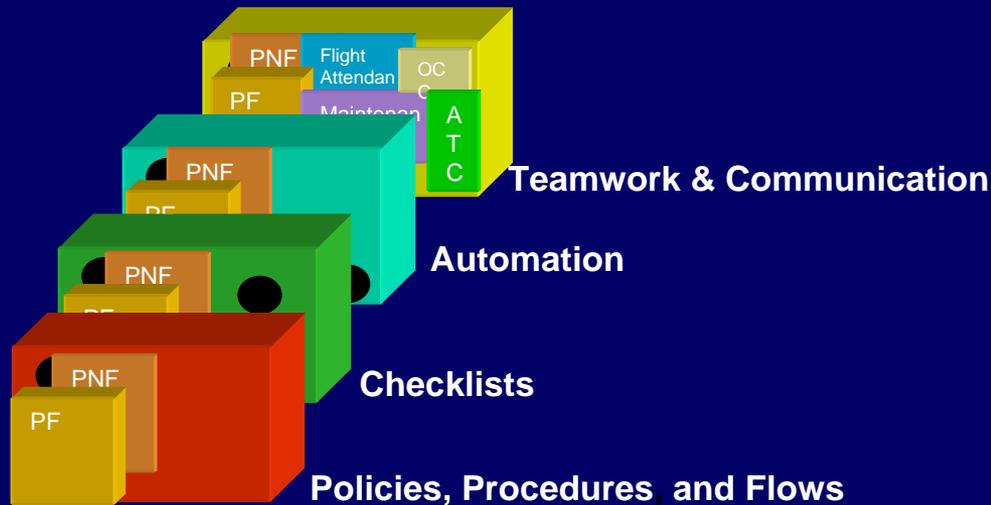


- Automation can catch errors it can also create errors
- Automation can **increase or decrease task loading**

Automation Levels

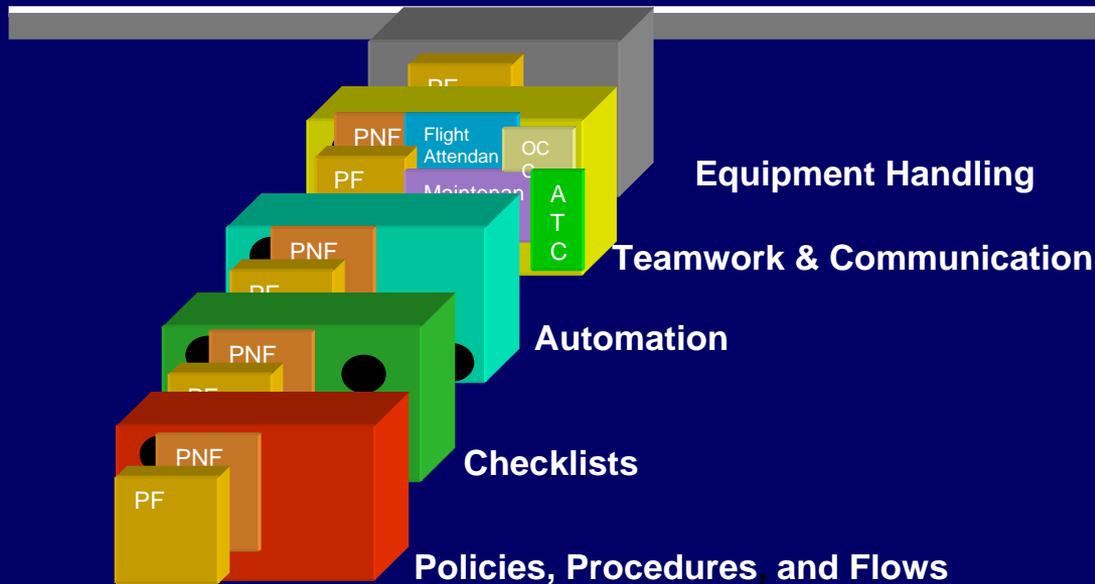
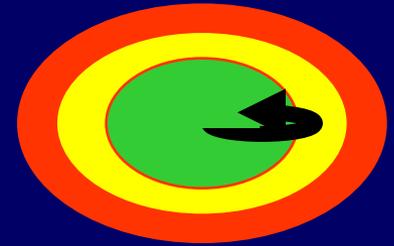
- **Level 1:** Everything off .. Raw data
 - Non-routine mode.
- **Level 2:** Autopilot off, optional use of AT and/or FD
 - Takeoff, initial departure, pilot Proficiency
- **Level 3:** Autopilot on, crew controls A/C with MCP FCU (or equivalent). Optional use of AT and/or and FD
 - Short range planning, terminal environment when responding to changes
- **Level 4:** Everything on. FMS is primary mode of controlling the A/C through the autopilot
 - Reduces task loading when able to pre-program

Teamwork and Communication



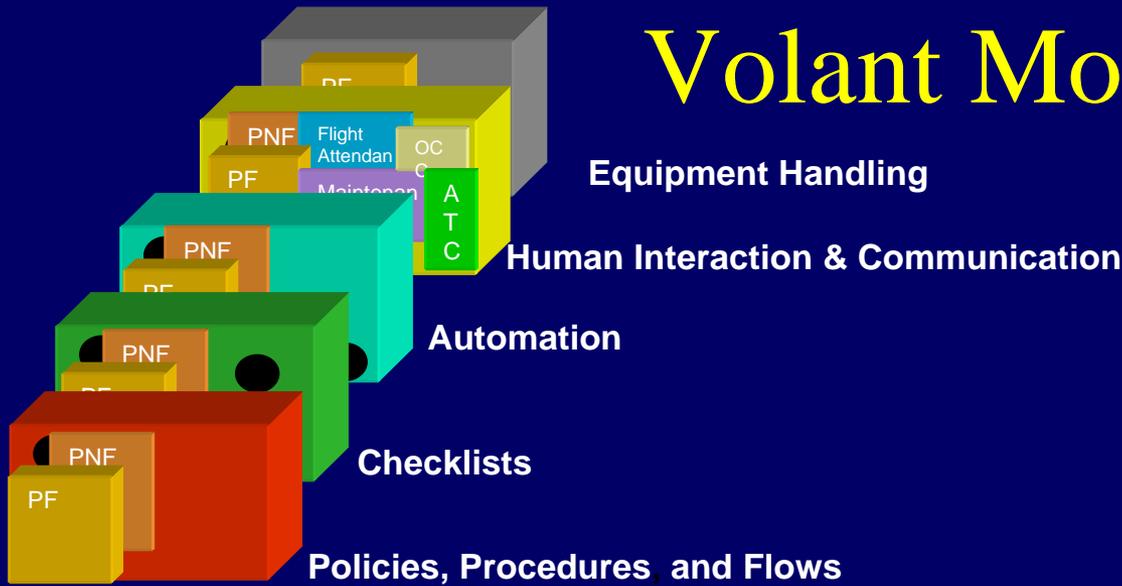
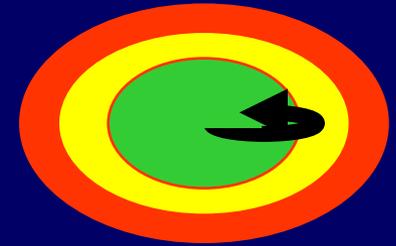
- Interpersonal Communication is one of the best sources of information
...but the cost can be high

Equipment Handling



- Equipment handling is the last barrier, and a most essential skill
 - It is the foundation the rest is built on
 - Includes the knowledge required to operate equipment

Volant Model



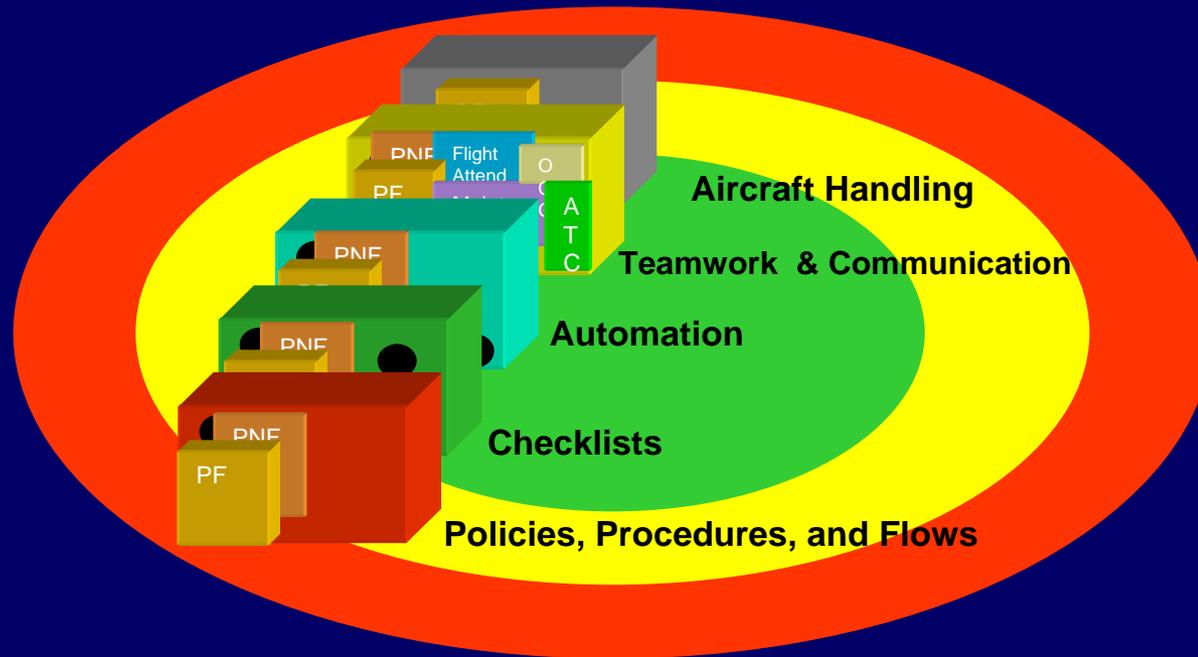
Shared Vision

- Provides a “language”
- Fosters unified development
- Creates framework for continuous learning

Integrated Use of Volant Model

- Provides a foundation for:
 - “Error-Trapping” tool for pilots
 - Policy and Procedure design
 - Curriculum Development Model
 - Debriefing Tool for Check Airmen
 - Communication Tool for Pilots
 - Crew Observations
 - Data Collection & Analyses

Pilot's ABC's for error management



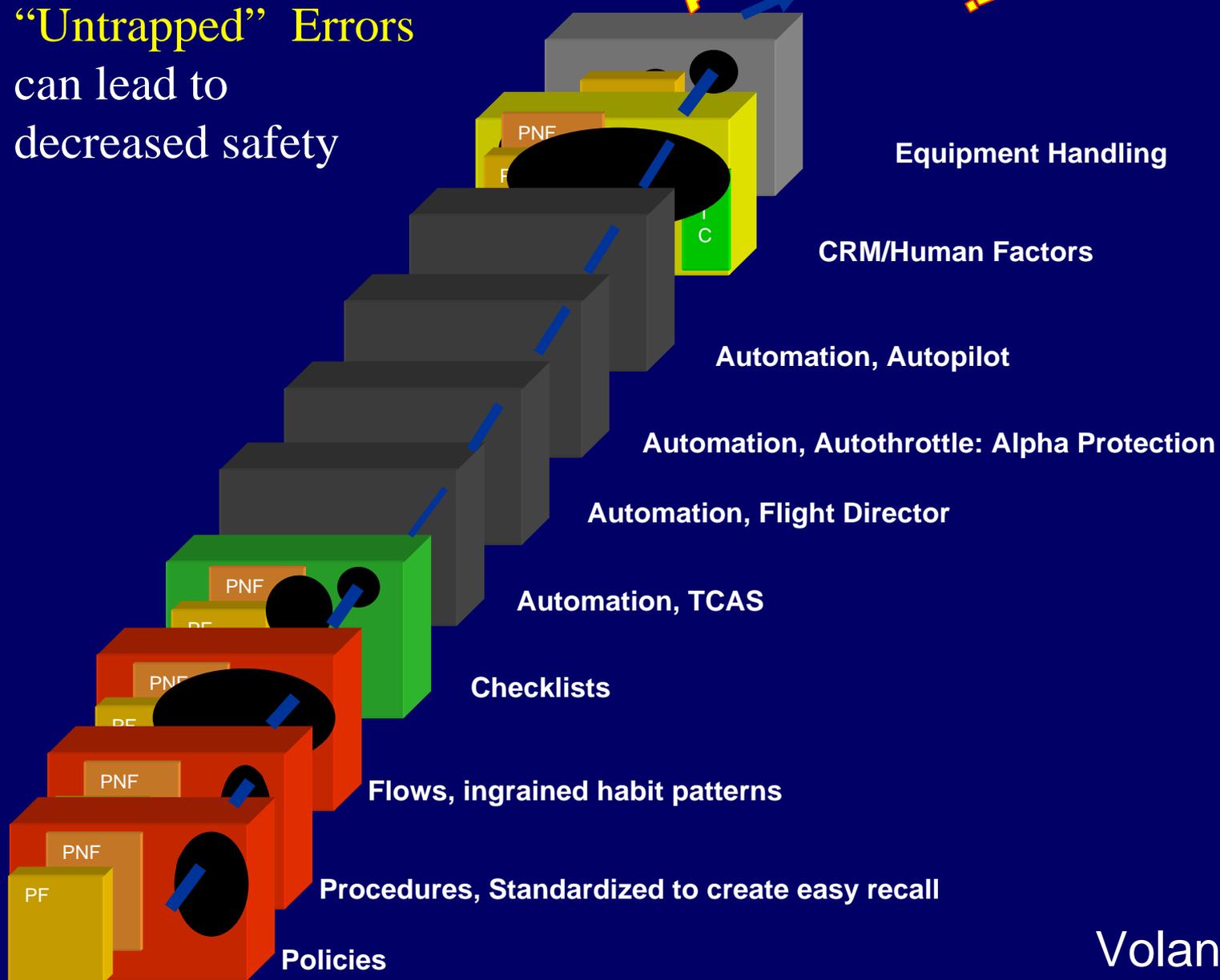
Assess the potential for Error

Balance the use of **Resources** to prevent and trap errors

Communicate Risks and Intentions

“Untrapped” Errors
can lead to
decreased safety

ACCIDENT !



Volant Model

© 1998 Electric

Standards of Performance Associated with the Volant Model

Policies

Description of Standard

- Pilot must be able to access source materials and correctly interpret guidance in a timely manner. (Respond to situation with use of source materials without adversely affecting task loading.)
- Policies implemented from memory must be consistent with guidance in source materials.
- Application of policy must be consistent with guidance in source materials.
- Application of policy must be appropriate for conditions

Procedures

Description of Standard

- Procedures shall be accomplished at the appropriate trigger point (conditions permitting) as provided in the PH and FOM
- Pilots must possess adequate knowledge to comply with all procedures in accordance with the pilot handbook and FOM without adversely increasing task loading.
- Callouts shall be made at the appropriate trigger point using verbiage provided in PH or FOM
- Unless conditions warrant, pilots shall comply with all procedures in accordance with source materials.

Flows

Description of Standard

- Flows shall be completed prior to each normal checklists (except Safety and Power On)
- All checklist items shall be accomplished by a flow before calling for the pertinent checklist.
- Flows shall be completed at the appropriate trigger point according to the checklist guidance table in the FOM.
- Flows should follow an established flow pattern. Flows must be linear, repeatable, and not miss any items.

5- point scale + application to Task Management Skills + Phase of Flight = 3-dimensional standards of performance

Pre-departure *Takeoff* *Climb* *Cruise* *Descent* *Approach*

	Generic Test Description	Policy & Procedures (FOM & POH)	Checklists	Automation	CRM	Aircraft Handling
5	No Errors, Good Margin of Safety.	No errors. Good Margin of Safety. All policies and procedures as stated in FOM and POH have been complied with on a timely basis. Policies need not be memorized if reference does not adversely increase task loading.	No errors. Good Margin of Safety. As applicable, checks done by flow, then by checklist. No checklist deviations (to include challenge and response) are detected. Called for by correct pilot and accomplished in a timely manner.	No errors exist after inputs are executed. Good Margin of Safety. Mode Control and Flight Management inputs are timely and appropriate for the situation, and are consistent with phase of flight, autopilot usage, or PF/PNF status.	Appropriate CRM skills clearly evident and highly effective. Task loading and stressor conditions are recognized and resolved immediately.	No errors. No deviations.
4	Errors occur but either are captured or are of a minor nature. Good Margin of Safety. (Minimal Task Loading caused by errors)	Errors occur but either are captured or are of a minor nature. (Key errors are minor in nature or are corrected in a timely manner. "Should" is not followed. Reference to Policy or Procedure in document adversely increased task loading.	Errors occur and are captured. Good Margin of Safety. As applicable, checks done then by checklist. Minor checklist deviations (challenge and response) detected by pilots. Accomplished in a timely manner.	Errors occur but are not detected in Mode Control and Flight Management inputs, or inputs were not timely, and/or appropriate for the situation, or consistent with phase of flight, autopilot usage, or PF/PNF status.	CRM skills and behavior are present. Task loading and stressor conditions are recognized and resolved with few exceptions. Appropriate coordination occurs to prevent errors from becoming cumulative.	Flight deviations recognized and corrected in a timely manner. Flight deviations do not cause distraction.
3	Errors occur which are not captured. Adequate Margin of Safety. (Task Loading may be increased by errors) Requires remediation (normally debrief)	Errors occur which are not captured. Adequate Margin of Safety. FOM or POH policies and/or procedures not followed. "Will", "Shall" and "Must" are not followed.	Errors occur which are not captured. Adequate Margin of Safety. As applicable, checks done then by flow or challenge and response not detected.	Errors occur which are not captured. Adequate Margin of Safety. Errors made but not detected in Mode Control and Flight Management inputs, or inputs were not timely, and/or appropriate for the situation, or consistent with phase of flight, autopilot usage, or PF/PNF status.	Required CRM skills and behavior are sometimes absent. Errors were recognized and the check times to make comments clearly.	Flight Deviations in excess of allowable PTS are not corrected in a timely manner. This level of performance is often caused by temporary distraction.
2	Significant errors occur which are not captured.	Significant errors occur which are not captured. DECREASED Margin of Safety. (FOM or POH policies and/or	Errors occur which are not captured. DECREASED Margin of Safety. Checks not preceded by flow	Significant errors occur which are not captured. DECREASED Margin of Safety. Errors made but not detected in	Required CRM skills and behavior are mostly absent. Errors are not recognized and/or	Significant deviations from PTS or failure to recognize small deviation in a timely manner.

Task Analysis:

TPO 003.000.000 **Takeoffs**

SPO 003.001.000 **Normal Takeoff
Procedure**

EOs

003.001.001	Release Brakes	(MS)	C
003.001.002	Align airplane on runway centerline	(MS)	C
003.001.003	Transfer control of airplane to First Officer, if required	(MS)	C
003.001.004	Call out": "YOU HAVE THE AIRCRAFT," if required	(K)	C
003.001.005	Call out": "I HAVE THE AIRCRAFT," if required	(K)	FO
003.001.006	Maintain directional control with Rudder Pedal	(MS)	PF

TPO-SPO-EO: Level of Detail vs. Standard Operating Procedures

009 .000 .000

Stall Recovery Operations

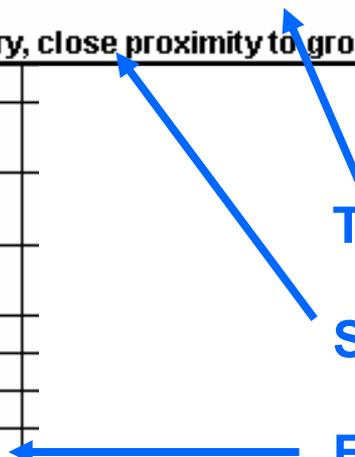
009 .001 .000Clean Stall Recovery, close proximity to ground

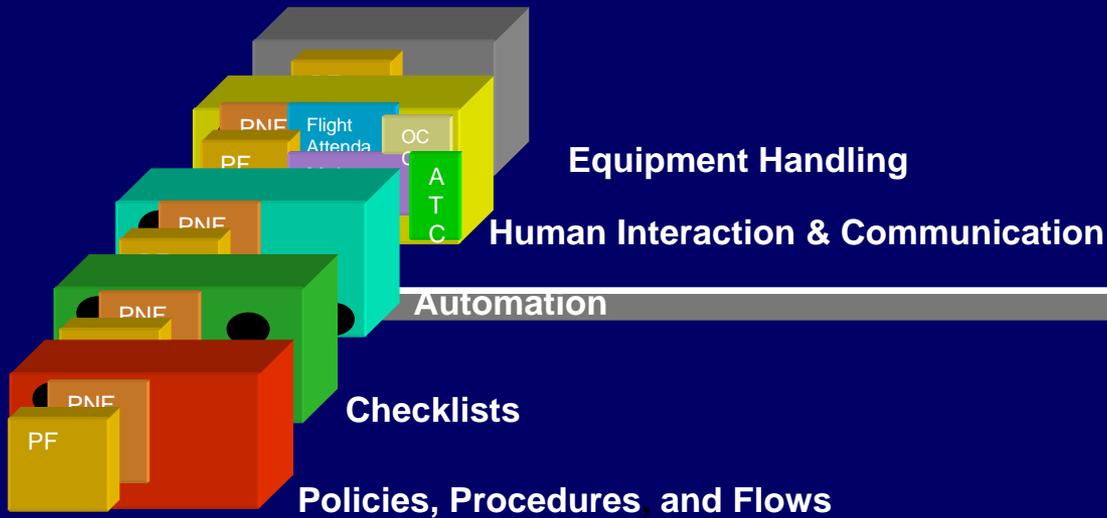
TPO.SPO.EO	PF	PNF
009.001.001	Identify Stickshaker	
009.001.002	Identify Initial Buffet	
009.001.003	Callout and apply: "FIREWALL THRUST"	
PF and PNF		
009.001.005	Press either TO/GA Switch	
TPO.SPO.EO	PF	PNF
009.001.006	Pitch smoothly toward 15 degrees Nose Up	
009.001.007		Ensure Firewall Thrust Set and Disengage Autothrottles
009.001.008	Disengage Autopilot, if On	
009.001.012		Ensure Autopilot Disengaged
009.001.013	Level Wings	
009.001.014	Respect Stickshaker	

TPO

SPO

EOs





TPO	T2	Pre-Departure Operations	Critical	Current	Task Management
T2		Pre-Departure Operations	Yes	Yes	TPO
S2		Administrative/Check-in Functions	No	Yes	Procedure
S3		Planning and Coordinating Duties	Yes	Yes	Procedure
S4		Meteorological Conditions Affecting Flight	Yes	Yes	Procedure
S5		Operational Issues Affecting Dispatch	Yes	Yes	Policy
S6		Airplane Maintenance Status	Yes	Yes	Procedure
S7		Minimum Equipment List and Configuration Deviation List Req.	Yes	Yes	Procedure
S8		Customer Service Functions	No	Yes	Policy
S9		Safety and Power On Checklist	Yes	Yes	Checklist
S10		Exterior Inspection	Yes	Yes	Flow
S11		Exterior Intermediate Inspection	Yes	Yes	Flow
S12		Interior Preflight Flow	Yes	Yes	Flow
S13		Cabin Originating / Receiving Insp when Flight Attendants Onbo	Yes	Yes	Flow

Airport

Ground conditions/signage
Equipment Inside the line
SID/STARS/Approach desing
Other
Ramp Congestion

Weather/Terrain

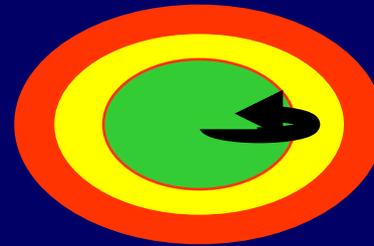
Icing
Other
Weather Extremes (hot or cold)
Convective Weather
Turbulence
Terrain
IMC
Visual Conditions

ATC

Radion Congestion
Nonstandard Phraseology
Similar Call Signs
Language/accnt
Change clearance

Aircraft

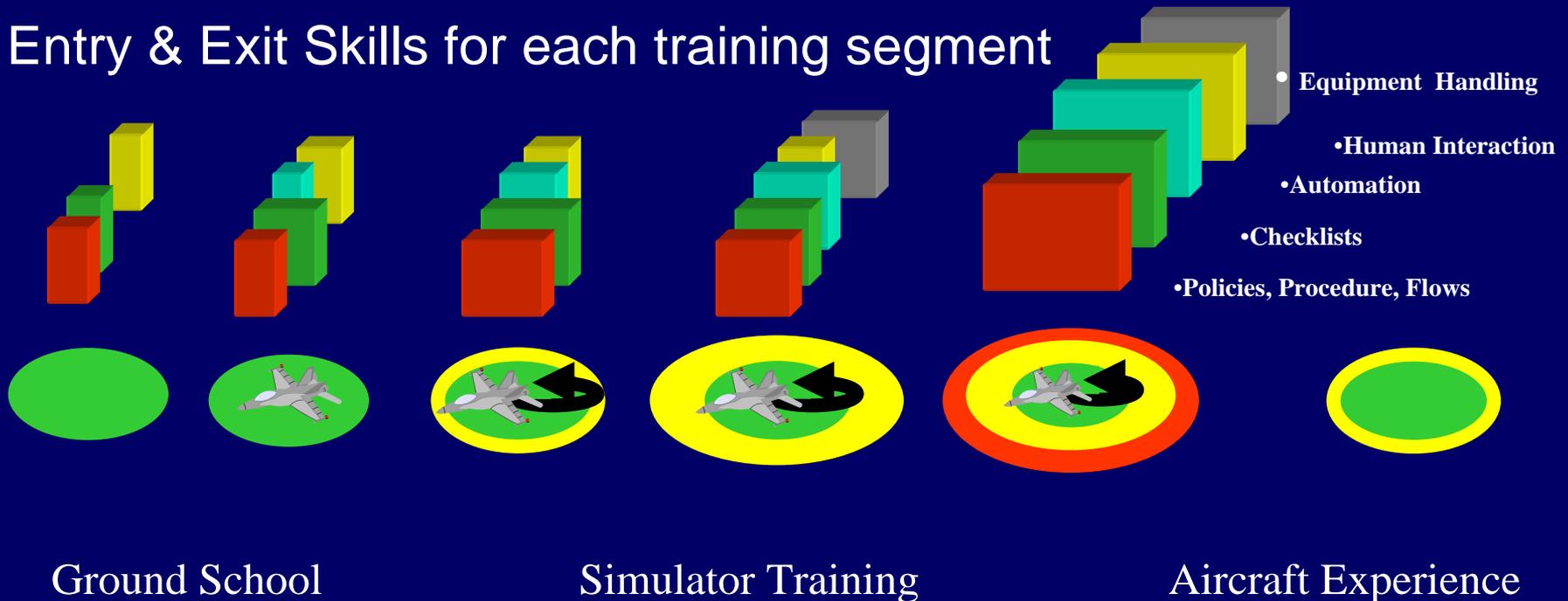
QRH non-normal
Supplemental normal
Other
CDL
MEL



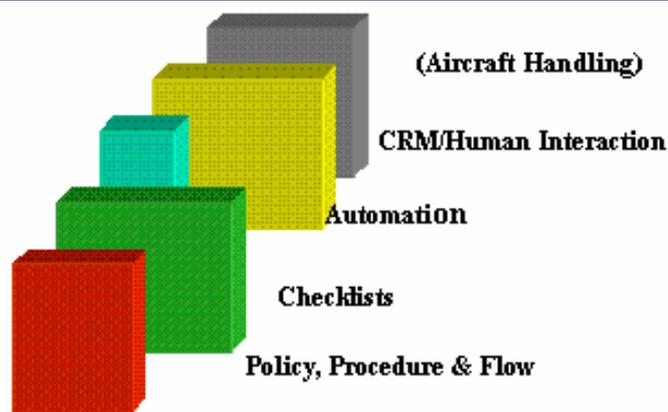
Curriculum Development

- Uses a building block method to create curriculum
- Consistent use of “task management skills” ensures seamless training
- Gradually increase task loading to ensure skills are proficient

Entry & Exit Skills for each training segment



Entry Level Skills for Differences Ground School Training



Entry Level Task Management Skills for Differences Ground Training

Basic Systems Knowledge

While the FAA recognizes the B-737 200 and 300/400 as the same series, US Airways fleet has significant differences. Pilots coming from the 200 series to the 300/400 series should have a level of systems knowledge equivalent to a student leaving 200 Initial ground training. Therefore, systems training should focus on significant differences.

Air Systems - The pneumatics systems of both airplanes are the same. Pressurization systems are alike. The controls and indicators are identical. The Air Conditioning systems are similar with the -300 having two pack flow rates. The 737-300 has a recirculation system.

Electrical - The electrical systems are very similar. The controls and indicators are the same. There is no bus-tie in the -300 and all airplanes have a DC standby bus.

Fuel System - The standard fuel systems between the two aircraft types are identical. The controls and indicators are the same. The 737-300/400 does have an auxiliary fuel system.

Hydraulic Systems - Both the 737-200 and 300 have three hydraulic systems. Controls and indicators are identical. Hydraulic Systems

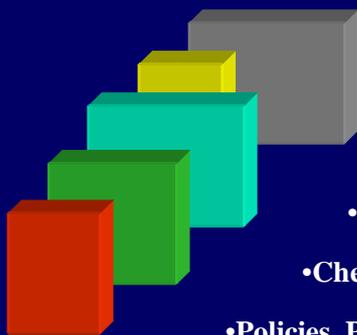
GradeSheetNan	ID	ACTIO	Description	Conditions	Objectives
Initial/Tran-2	M31		Initial Maneuvers Training 2		
Initial/Tran-2			SPOT 1		
Initial/Tran-2	T2		Pre-Departure		Receiving Checklist
Initial/Tran-2	TM1		Policy, Procedure, and Flow		
Initial/Tran-2	S16	Validate	Captain's Originating/Receiving Flow		Receiving Checklist
Initial/Tran-2	S17	Validate	First Officer's Originating/Receiving Flow		
Initial/Tran-2	S4	Observe	Assess Meteorological Environment		
Initial/Tran-2	S5	Observe	Assess Operational Environment		
Initial/Tran-2	S6	Observe	Assess Airplane Maintenance Status		
Initial/Tran-2	S18	Validate	Captain's Before Start Flow to the Line		
Initial/Tran-2	S19	Validate	First Officer's Before Start Flow to the Line		
Initial/Tran-2	S20	Validate	Departure Review		
Initial/Tran-2	S21	Validate	Before Start Flow Below the Line		
Initial/Tran-2	TM3		Automation		
Initial/Tran-2	S98	Validate	FMC Preflight		
Initial/Tran-2	TM2		Checklists		
Initial/Tran-2	s160	Validate	Normal Procedures Checklists Policy		
Initial/Tran-2	T3		Pushback / Taxi		Hung Start and No Starter Cut
Initial/Tran-2	TM1		Policy, Procedure, and Flow		
Initial/Tran-2	S22	Observe	Airplane Pushback Procedures		
Initial/Tran-2	S23	Validate	Normal Engine Start Procedure		
Initial/Tran-2	S19	Validate	After Start Flow		
Initial/Tran-2	S26	Observe	Taxi Out Operations		
Initial/Tran-2	S27	Validate	Captain's Before Takeoff Procedures and Flow Down to the Line		
Initial/Tran-2	S28	Validate	Takeoff Briefing		
Initial/Tran-2	S29	Validate	First Officer's Before Takeoff Procedures and Flow Down to the Line		
Initial/Tran-2	S30	Validate	Before Takeoff Procedures and Flow Below the Line		
Initial/Tran-2	TM3		Automation		
Initial/Tran-2	S99	Validate	FMC Update During Taxi-out		Load FMC takeoff data
Initial/Tran-2	TM2		Checklists		
Initial/Tran-2	s160	Validate	Normal Procedures Checklists Policy		
Initial/Tran-2	S140	Validate	Non-Normal Methods		
Initial/Tran-2	S141	Validate	Non-Normal Reference Checklist Procedures		
Initial/Tran-2	S142	Validate	Non-Normal Checklist with Immediate Action Items		
Initial/Tran-2	S111	Validate	Non-Normal QRH Immediate Action Items		
Initial/Tran-2	S112	Validate	Non-Normal QRH Reference Items		

Curriculum Audit: Boeing 737-300/400 Transition

B73734: Normal Takeoff Procedure

729	S31	4	1	FTD-4	Introduce	Normal Takeoff Procedure		Special Emphasis: Thrust setting Procedures
729	S31	4	1	FTD-5	Observe	Normal Takeoff Procedure		Emphasis on thrust setting procedures and calls
729	S31	4	1	FTD-6	Observe	Normal Takeoff Procedure		
729	S31	4	1	FTD-7	Observe	Normal Takeoff Procedure		
729	S31	4	1	FTD-8	Validate	Normal Takeoff Procedure		
729	S31	4	1	SysProc Val-1	Sample	Takeoff		
729	S31	4	1	Initial/Tran-1	Introduce	Normal Takeoff Procedure	Flight director Off, 500 RVR Capt 1500 RVR FO	Validate thrust setting procedure and call outs
729	S31	4	1	Initial/Tran-2	Observe	Normal Takeoff Procedure	Crosswind, Flight Director ON, Min V1	The V1 call should be made at the pre-established Min V1 minus 5 knots
729	S31	4	1	Initial/Tran-2	Observe	Normal Takeoff Procedure		
729	S31	4	1	Initial/Tran-3	Observe	Normal Takeoff Procedure	Bleed trip prior to V1	Bleed Trip prior to V1, GO decision after 80 kts for master caution
729	S31	4	1	Initial/Tran-3	Observe	Normal Takeoff Procedure		
729	S31	4	1	Initial/Tran-4	Observe	Normal Takeoff Procedure	FD ON, Crosswind	
729	S31	4	1	Initial/Tran-4	Validate	Normal Takeoff Procedure	500 RVR Capt 1500 RVR FO	
729	S31	4	1	Initial/Tran-4	Validate	Normal Takeoff Procedure		
729	S31	4	1	Initial/Tran-4	Validate	Normal Takeoff Procedure	Bleeds Off	
729	S31	4	1	Initial/Tran-4	Validate	Normal Takeoff Procedure	Flight director On, 500 RVR Capt 1500 RVR FO	





- Aircraft Handling
- Teamwork and Communication
- Automation
- Checklists
- Policies, Procedure, Flows

(page from Check Airman Handbook)

Takeoff Operations			
<ul style="list-style-type: none"> • → Begin session with engines running and accomplish the Before Takeoff Checklist • → Issue an ATC clearance using the RNAV capability of the FMC • → Set the weather commensurate with non-precision approach minimums 			
Action	Maneuvers	Conditions	Objectives
Policy, Procedure, and Flow			
Observe	Normal Takeoff Procedure	FD on, Crosswind	
Validate	Normal After Takeoff Procedure		
Validate	After Takeoff Flow		
Aircraft Handling			
Validate	Aircraft Handling - Takeoff Operations		
Climb Operations			
<ul style="list-style-type: none"> • → FMC Departure 			
Policy, Procedure, and Flow			
Validate	Normal Climb		
Observe	FMC Climb		
Automation			



Flight Training Data Management System

Version 2.0

Date: 6/17/2002 Evaluator ID: 47950 Session: A FAA Observer ID: N/A

Aircraft Type: 737-3/4 pilots graded at once: 2
 pilots graded at once (session): 2
 pilots graded 2
 Legs 0
 Gradesheet: Initial/Tran-2

Items		Left Seat Pilot ID # 200				Right Seat Pilot ID # 300					
Maneuvers	Objectives	Left Pilot Observation			Repeats	Right Pilot Observation			Repeats		
Pre-Departure	Receiving Checklist	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0
Pushback / Taxi	Hung Start and No Starter Cutout	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0
Takeoff Operations:	Crosswind, Flight Director ON, Min V1	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0
Climb Operations	Cargo Door Open, Return to Field	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0
Descent Operations	VOR Approach Arc to Final	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0
Approach Operations: Non-Precision	VOR Approach Arc to Final	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0
Landing Operations: Manual	Crosswind	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0
Takeoff Operations: Rejected Takeoff	Critical Field Length	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0	<input type="radio"/> P	<input type="radio"/> N	<input type="radio"/> A	Reasons	0

Flight Training Line Data Collection Form

Section 1: Check Airman: ID 54321 FAA Inspector: ID Date 9/1/01

Aircraft: B737-300/400 B737-200 B757/767 F-100 MD80 A319/320/321 A330

Area: Domestic Caribbean International

Pilot Flying Leg: Captain First Officer

Route: Departure Airport: KPIIT

Arrival Airport: KABE

Type of Approach: CAT I ILS CAT II/III ILS
 Visual LOC/VOR RNAV Other

Section 2: Additive Conditions

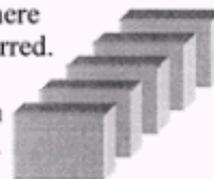
Use other side of form if needed to describe situation.

	Pre-departure	Pushback/Taxi	Takeoff	Climb/Cruise	Descent	Approach/Landing	Taxi/Park
Airport							
Ramp Congestion	<input type="radio"/>	<input type="radio"/>				<input type="radio"/>	<input type="radio"/>
Ground conditions/Signage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>
Equipment inside of the line	<input type="radio"/>	<input type="radio"/>					<input type="radio"/>
SID/STAR/Approach / Airport Diagram Design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weather/Terrain							
IMC	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Terrain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Turbulence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Icing (ground or airborne)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Convective Weather	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visual Conditions						<input type="radio"/>	
Weather Extremes (Hot or Cold)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 3: Errors/Deviations

Please check items where errors/deviations occurred.

Use other side of form for more information.



	Pre-departure	Pushback/Taxi	Takeoff	Climb/Cruise	Descent	Approach/Landing	Taxi/Park
Policy							
Misinterpretation after reference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Misinterpretation without reference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intentional Non compliance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Altitude Awareness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procedure							
Lack of knowledge or skill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Timeliness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Callouts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intentional Non compliance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flow							
Incomplete/missed item(s)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not done	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Checklist							
Improper initiation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Missed Item(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Item(s) not verified	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Done from Memory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not Done	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Event/Distraction	1	2	3	4	5	6	7
OCC Event/Distraction				0	0	0	0
CLP Event/Distraction	0	●	0				
Other	0	0	0	0	0	0	0
Crew Factors							
Fatigue	0	0	0	0	0	0	0
Food	●	0	0	0	0	0	0
Low Experience	0	0	0	0	0	0	0
Complacency/Distraction	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Operational							
Time Pressure/Delay	●	0	0	0	0	0	0
Unfamiliar airport	0	0	0	0	0	0	●
Late Crew Arrival	●						
Late A/C arrival	0						
Holding				0	0	0	
Missed Approach				0	0	0	
Other	0	0	0	0	0	●	0
Cabin							
Passenger Distraction/Event	0	0	0	0	0	0	0
Flight Attendant Distraction/Event	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0

Event/Distraction	1	2	3	4	5	6	7
Descent Planning				0	0		
Inappropriate a/c configuration				0	0	0	0
Unstabilized Approach							0
Other	0	0	0	0	0	0	0
							
Management (ABCs)							
Acknowledge potential for error							
Failed to maintain Situational Awareness	0	0	0	0	0	0	0
Failed to consider additive conditions	0	0	0	0	0	0	0
Failed to reassess decision with changing condition	0	0	0	0	0	0	0
Balance use of Barriers (resources)							
Failed to maintain level of redundancy to catch errors	0	0	0	0	0	0	0
Failed to prioritize to avoid being overtasked / distracted	0	0	0	0	0	0	0
Failed to consider available time	0	0	0	0	0	0	0
Communicate risks and intentions							
Failed to communicate additive conditions/ risks							
Failed to communicate intentions	0	0	0	0	0	0	0

Section 4

Position Observed	Pre-Departure	Pushback/ Taxi	Takeoff	Climb/ Cruise	Descent	App/ Land	Taxi/ Park
Capt	5 ● 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
First Officer	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 ● 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
IRO	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1

OF-46 Rev 901

Data Reporting Format

Table	#	Field	Description	ShortName	Type	Field Size	Req'd Values	Example	Notes
PDRT	1	Measured Item	The task, maneuver, procedure, or event set statement.	MItem	Text	80		Perform Engine Failure Procedure	If N/A (for Qual SV and PV), enter "N/A" (specific format).

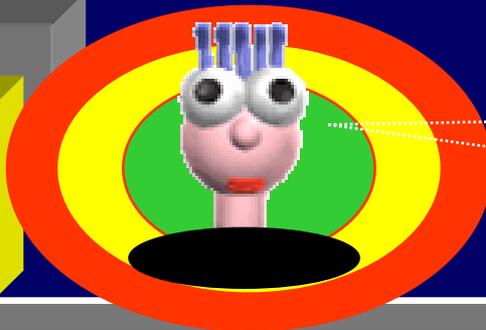
Table	#	Field	Description	ShortName	Type	Field Size	Req'd Values	Example	Notes
TORT	2	Measured Item ID	An alphanumeric used to identify the task, maneuver, procedure or event set being graded.	MItemID	Text	12		1.2.1.3, KK73456, 167	
	25	Objective ID	An alphanumeric assigned to each terminal or supporting objective that is tested by the MItem.	ObjID	Text	12		3.2	List all the TPO's, SPO's, or other high level objective grouping ID's from the PADB that apply to the Measured Item.
	26	Objective Title	A description of the objective ID.	ObjTitle	Text	80		Perform Engine Fire Procedure	List the title of the TPO's, SPO's or other high level groupings from the PADB that apply to the Measured Item.
	27	Objective Type	A description of the objective type.	ObjType	Text	5	TPO, SPO	TPO	Report TPO's, SPO's or other high level objective groupings from the PADB that apply to the Measured Item.

TPL RRLOE : Training Mode - [Flight Breakdown For Unsaved Flight]

File Edit Mode Tools Window Help

Eight or Nine Phases of Flight Ideal for training

1 Event Set(s)	1 Event Set(s)	1 Event Set(s)	1 Event Set(s)	1 Event Set(s)	1 Event Set(s)	1 Event Set(s)	1 Event Set(s)
Passenger No-Show	Engine Failure	Engine Out Climb	Engine Out Cruise	Engine Out Descent	S/E ILS CAT I	S/E Manual	S/E Taxi
			Change Plane MD80 (Example)				
Skill Area 1 Skill Area 2 Skill Area 3 Skill Area 4	Skill Area 4 Skill Area 5 Skill Area 6	Skill Area 1 Skill Area 3 Skill Area 4	Skill Area 1 Skill Area 3 Skill Area 6	Skill Area 1 Skill Area 2 Skill Area 3 Skill Area 4 Skill Area 6	Skill Area 1 Skill Area 2 Skill Area 3 Skill Area 4 Skill Area 6	Skill Area 1 Skill Area 2 Skill Area 4 Skill Area 6	Skill Area 1 Skill Area 3 Skill Area 5 Skill Area 6
Pre-flight ground	Takeoff	Climb	Cruise	Descent	Approach	Landing	After-landing
0:25 0 ft. 30 kts. 99E nm. 4	0:30 50 ft. 200 kts. 94E nm. 6	0:50 20000 ft. 250 kts. 89E nm. 4	0:56 20000 ft. 250 kts. 39E nm. 5	1:08 E000 ft. 250 kts. 34E nm. 5	1:18 200 ft. 150 kts. 31E nm. 6	1:21 0 ft. 0 kts. 30E nm. 5	1:29 0 ft. 0 kts. 29E nm. 3
1 Attempt Max Attempts: 10	 Build Flight  Reset Flight  Restore Previous  Save Flight  Pair Route				Overall Flight Difficulty Average: 4.7E User Established Minimum Difficulty: 2.8 User Established Maximum Difficulty: 5.2		



Begin Sharing:

- Phases of Flight
- Procedure Names
- Standards of Performance
 - Policy, Procedure, Flow Identification
- Conditions
- Systems
- Feedback from Training for better document design
 - Critical & Currency
- Developing Unique cross-linking ID s
- Identification of “Point in Time” information requirements

Start Talking!