PROFESSIONAL PILOT

PROVEN TACTICS AND PIC STRATEGIES

THIRD EDITION

JOHN LOWERY

JOHN LOWERY is a retired U.S. Air Force and commercial pilot with more than 13,500 hours of flying a wide variety of both light and high performance large aircraft. He taught for ten years as an adjunct assistant professor of aeronautical science for Embry-Riddle Aeronautical University at the McClellan AFB campus. Currently he resides in Folsom, California.

Professional Pilot, Third Edition
by John Lowery

Aviation Supplies & Academics, Inc.
7005 132nd Place SE
Newcastle, WA 98059
www.asa2fly.com / asa@asa2fly.com

Third Edition published 2008 by Aviation Supplies & Academics.
First edition 2001, Iowa State University Press.

Photography © John Lowery unless otherwise noted. Photos p. 74–76, 291, courtesy National Aeronautics and Space Administration (NASA); p. 80, 288 and 308, courtesy Paul Bowen; p. 112, John Fendly; p. 176, the Raisback Group; p. 182, Federal Aviation Administration (FAA); p.183, National Transportation Safety Board (NTSB); p. 201, Perkins & Rieke; p. 236, Alese and Morton Pechter; p. 256, 259, and 261, the National Center for Atmospheric Research (NCAR).

Printed in the United States of America
2011 2010 2009 2008 9 8 7 6 5 4 3 2 1

ASA-PRO-PILOT-3
ISBN 1-56027-709-2
978-1-56027-709-5

Library of Congress Cataloging-in-Publication Data
Lowery, John.
Professional pilot / John Lowery.
p. cm.
Includes bibliographical references and index.
1. Aeronautics—Safety measures. 2. Airplanes—Piloting. I. Title.
TL553.5.L69 2001
629.132'52—dc21 00-053840

CONTENTS

RESOURCE MANAGEMENT

...Using Everything Available

1

Called Crew Resource Management (CRM) in multi-crew aircraft, and Single Pilot Resource Management (SRM) in general aviation, it is a popular topic that seems to mean different things to different people. In reality, it is a discipline concerned with how pilots and crews manage the equipment, information and support team members made available to them "to ensure that the successful outcome of the flight is never in doubt." This also encompasses the responsibilities of management in the conduct of flying operations.

In private single-engine airplanes or the new very light jets, SRM involves managing automation, navigation and air traffic control such that the pilot can accurately and safely operate in the National Airspace System.

Up until now, pilots could make three takeoff and landings in an aircraft and legally qualify as PIC. Radios and cockpit layouts have been so similar that qualifying has been essentially a "one size fits all" operation. Management of cockpit resources has involved seemingly basic things, like use of the flight director system, or use of cowl flaps to control cylinder head temperature. Although from a legal perspective staying current hasn't changed, modern avionics are changing the stakes for pilot qualification.

The introduction of GPS and LORAN systems to general aviation has led to the neglect of some basic skills, e.g., use of analog nav radios and charts. As a long-time flight instructor I have often seen pilots on VFR cross-country flights simply dial in the destination airport on the GPS or LORAN and never look at a sectional chart or cross-check a VOR or NDB en route. Further, they do not consider the need for an enroute alternate or identify areas suitable for an emergency landing. These are some examples of not using all the resources available. Unfortunately, these pilots wind up in trouble when anything untoward occurs.

Meanwhile the GA accident record, while improving each year, has shown a continuing trend toward a high number of fatalities due to weather—usually controlled flight into terrain—by non-instrument rated pilots. Loss of control also accounts for a high number of fatalities each year. These mishaps suggest that inadequate training, knowledge and proficiency lead to fatally-flawed judgment.

With these factors and evolving technology in mind, the FAA initiated a System Safety Management Program that outlined the objectives and planned activities of their safety effort, "as it applies to the safety management for all systems, new and old, providing air traffic control and navigation services in the NAS, as well as the acquisition of systems in support of National Airspace System (NAS) modernization."

With SRM in mind, the new generation of technically advanced small reciprocating and jet powered (12,500 pounds maximum gross weight) aircraft, with glass cockpits and multi-function displays, has made it clear that a new approach to training and proficiency is needed. Electronic flight instrumentation systems require thorough instruction in order to be used proficiently and safely in the national airspace system.

Without a new approach to training, pilot workload in new electronic cockpits becomes very high. The increase in workload means more head-down time in the cockpit. Thus in VMC, pilots are less likely to see and avoid other traffic. Therefore, proper training requires extensive use of mockups and simulators to gain true proficiency.

Concurrently, procedures for operating in the national airspace are evolving and becoming more complex. As the FAA's Operational Evolution Plan (OEP) takes effect and advanced airspace concepts such as free flight emerge, the changes include newer electronic systems and other flight technologies.

This has led to a program called FAA Industry Training Standards (FITS) which is an effort to make transition-training more relevant to pilots of new technically advanced aircraft (TAA) who will be operating in the evolving National Airspace System.

To develop FITS, FAA partnered with industry and academia to develop new flight training programs that teach aircraft and cockpit systems as well as the realistic use of the NAS—essentially like getting a type rating in a commuter or jet transport. (An example of this concept originated with the Beech factory training—later Flight Safety International—for pilots transitioning to the aerodynamically and electronically sophisticated Starship.)

Crew Resource Management

The basics of CRM should begin in the initial phase of flight training and continue for the rest of one's flying career. A NASA–Ames Research Center study showed that pilots and crewmembers frequently failed to identify and use information and human resources that were readily available. In fact, one study showed approximately 60 percent of the fatal commercial jet accidents involved improper CRM. The study identified five training objectives in teaching proper CRM:

1. Definition of individual crewmember roles and responsibilities during flight operations.
2. Better definition of crewmember roles and responsibilities within the company.
3. Recognizing the importance of monitoring, cross-checking and communicating effectively.
4. Recognition of available resources including manuals, other crewmembers, Air Traffic Control (ATC), maintenance, dispatch, etc.
5. Recognizing that resource management is the responsibility of all crewmembers, not just the captain.

Captain's Authority

In a multi-crew airplane, CRM is not designed to dilute the captain's authority or leadership position. Instead, it challenges the captain to exercise leadership and discharge responsibilities so that on each flight maximum use is realized from all human and technical resources.

When the captain creates an atmosphere where crewmembers can speak up and contribute responsibly to the operation, then his/her authority is strengthened because of valuable input from the entire crew. In other words, he/she is fully using available cockpit resources — the copilot, flight engineer and cabin attendants.

Single Pilot

For single pilot operation, the goal of SRM is to ensure proper use of all support team members, related equipment and all available information "in managing the automation and associated aircraft control and navigation tasks." The FAA's FITS program — supported by insurance companies — will ensure competent piloting in the new generation of technically advanced aircraft: The pilot's knowledge-base and personality will ensure good decision making.

For example, how often have you seen a pilot preflight planning with an out-of-date airport directory, or looking for information in an ancient edition of Aircraft Owners and Pilots Association Airport Directory? Then there's the pilot who flies VFR over hostile terrain without a chart. Later, when the engine quits, this person will call ATC for vectors to the nearest airfield. If the ensuing crash is survived, ATC is faulted for not quickly providing guidance to a suitable field. Yet with proper use of resources (a chart), enroute airfields or areas suitable for an emergency landing would have been pre-located and monitored by the "pilot in command."

Often, GPS predominates en route, while VOR and low-frequency radios — both of which provide valuable backup — are ignored. Approaching to land, the GPS pilot then takes a quick first look in an airport directory to obtain frequencies and runway alignment. Now he is head-down in the cockpit, in the area that is statistically most susceptible to midair collisions — the airport environment.

Inadequate proficiency with cockpit instrumentation can lead to midair collisions too. The pilot will be constantly head-down in the traffic area while trying to setup for landing. (Remember despite an IFR clearance and radar-contact with ATC, in VMC it is still *your* obligation to see and avoid other traffic.)

Crew Concept

Some time back I agreed to fly copilot on a Citation trip with a captain who was quite senior. He had flown Falcon 50s previously so one would assume he was well acquainted with the two-crew concept. During our preflight briefing he began with, "Look, you're here because the FAA requires it. You can handle the radios, but don't touch anything or do anything unless I tell you to." Since I am rather senior myself, and have been a pilot proficiency examiner for the past 25 years, I honestly thought he was kidding.

He did allow me to copy the clearance, but reached across to dial in all the frequencies and push the changeover button. Later, at a thousand feet above El Centro airport — our destination — in clear desert skies, ATC asked if we were ready to cancel our IFR flight plan. Since we were entering the traffic pattern and very late making our presence known on CTAF, I responded "affirmative." I was chastised immediately since "he" was not ready to cancel.

PROFESSIONAL PILOT

PROVEN TACTICS AND PIC STRATEGIES

THIRD EDITION

JOHN LOWERY

Driving today's sophisticated turbine aircraft involves much more than just following FAA regulations and POH guidelines.

Professional Pilot is about decision making: that is, the element that sets the captain apart from the rest of the crew. It is filled with the kind of insightful tips, stories, facts and mythbusting that will change how you operate as PIC. Far from your typical textbook on aerodynamics and systems, *Professional Pilot* takes you right up front to learn from a master turbine pilot who's been there.

John Lowery combines 50 years of experience as a corporate pilot and pilot examiner with fluid discussions that probe the details all career aviators must understand. Along the way you will find a new level of understanding about day-to-day, real-world flying you thought you long understood, and gain a full indoctrination into the topics that matter when flying heavy, high, and fast.

This Third Edition includes up-to-date cockpit and airport procedures and recent upgrades in communications and navigation equipment. FITS (FAA/Industry Training Standards) are now included, and information has been added to prepare pilots for today's state-of-the-art "TAA" (technically-advanced aircraft) and VLJs (very-light jets).

Within this collection of impressive know-how, you'll uncover the vital story behind such topics as:

- Takeoff V-speeds, runway length requirements, and the real physics of takeoff performance
- Handling runway contamination
- Cruising speed and fuel control in turbine aircraft
- Dynamics of high altitude flight
- Managing icing conditions
- Surviving emergencies such as rapid decompression and in-flight fires

Author John Lowery has been a flight instructor since 1961. He first soloed a Piper J-3 Cub on June 4, 1944 at age 16. Graduating from Auburn University in 1951, he spent 23 years in the U.S.A.F. flying high performance aircraft. During a brief break in service in 1955 he flew DC-3s for Western Airlines as a First Officer. Since retirement from the Air Force in January 1975, he has been a practicing flight instructor and FAA-Designated Pilot Proficiency Examiner in the Sabreliner corporate jet, and also a Pilot Examiner in the King Air turbo-prop series and various light airplanes. He holds an ATP Certificate with numerous type ratings, a Commercial with single- and multi-engine sea ratings, an instrument/multi-engine flight instructors' certificate, and has accumulated more than 13,500 flying hours. Concurrently he earned a Master's Degree in Aeronautical Science from Embry Riddle Aeronautical University, and taught both graduate and undergraduate courses at ERAU. He remains active today as an aviation writer and consultant in selected aircraft accidents.

Aviation Supplies & Academics, Inc.
7005 132nd Place SE
Newcastle, Washington 98059
www.asa2fly.com • 1-800-ASA-2-FLY

PNR ASA-PRO-PILOT-3

ISBN 978-1-56027-709-5
9 781560 277095
53495