Air Safety Week®

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Air Safety & Aviation Security Trends and Critical Analysis

Incorporating Airport Security Report

March 12, 2007
Washington, D.C.

Vol. 21 No. 10
www.aviationtoday.com

To Set Alight a Satellite

The Air Safety Consequences of China's Satellite Destruction

Aviation Safety

In a display of maximal machismo, apparently to prove its status as an emerging Super Power, China on Jan. 11 blew up one of its own defunct weather satellites. thereby joining an exclusive club of countries with space weapons.

Using a ground-based medium-range ballistic missile launched from Xichang Space Center in Sichuan Province, the test knocked out an aging Chinese weather satellite about 537 miles (860 kilometers) above the earth through "kinetic impact". Prior to this less than stunning achievement, only the U.S. and Russia had bothered to achieve this feat — and before that, George Lucas and President Reagan (but the latter only in his Star Wars fantasies).

It's likely that this Eastern great leap forward was designed to stir tumult and it appears to have succeeded. The question on puzzled lips is mostly: *Why?* What did China hope to achieve? More importantly for our purposes, what are the air safety ramifications of this dubious achievement?

First, it must be pointed out that there is a vast difference between China knocking out one of its own obsolescent pieces of space junk sitting in low earth orbit (LEO), only 500 miles up, and decimating somebody else's GPS bird that resides 10,000 miles above the earth. So much for the targeting and ident aspect; what about their contribution to space debris?

Reports have the explosion smithereening or sundering their old satellite, so there's somewhere between two and 200,000 new pieces of debris for NASA's computers to track. Most of it won't be staying up in LEO for too long. The larger pieces will ultimately decay and fall to earth. There's not a lot of probability of seeing a piece in your backyard or wearing one as an unwanted souvenir.

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The MU-2 in its "Accidental" Profile

The Maker of The Widely Prevalent Aircraft Weighs In

Aviation Safety

In the interest of fairness, balance and thoroughness, we've made the following space available to Mitsubishi Heavy Industries American, Inc., (MHIA), to provide more information about its popular MU-2 airplane. This rebuttal comes in the wake of recent dispatches in 2006 in this newsletter that scrutinized the safety of the aircraft (see Sept. 18 and Dec. 4 issues).

A few facts seem to be inadvertently overlooked when it comes to media discussions of the performance and handling characteristics of the MU-2 plane. Knowledge of these characteristics should be of keen interest to the readership of *ASW*.

Is Flight in Known Icing a MU-2 Problem?

Few people know that the MU-2 is the only general aviation airplane to fly behind the Air Force icing tanker while Supercooled Large Droplets (SLD) were sprayed from a six-foot diameter array and allowed to impinge on all aerodynamic surfaces for the Federal Aviation Administration (FAA) to study icing effects on the plane. These SLD droplets are much larger than Appendix C icing droplets that are the basis of all aircraft icing certification.

After all SLD flight tests were completed, including actual flights with artificial ice shapes attached to the wings and tail that simulated the shapes that were photographed during the SLD encounters, the FAA came to a conclusion that no other general aviation

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aircraft has attained. The FAA proved to their satisfaction that, in the event a pilot inadvertently flew into SLD icing conditions, the MU-2 provides the capability to permit the pilot to safely exit those conditions.

This extensive icing flight test also resulted in the FAA reconfirming that the MU-2 meets the certification requirements for flight into known icing

Also of significance is that MHI/MHIA created a video presentation that has been approved by the FAA to be viewed by all MU-2 pilots who want to be able to fly in icing conditions if necessary. This video has been utilized by training facilities such as Embry Riddle and provided to NASA as a supplement for their programs.

SCRs and Safety Evaluation Conclusion

While many know that the MU-2 was the subject of two Special Certification Reviews (SCRs) and, more recently, a safety evaluation by the FAA over the 40 years that the airplane has been in operation, many might not know that in each and every case, the FAA has found that the MU-2 meets or exceeds all certification requirements. This is especially significant because one certification requirement is that the aircraft can be safely flown by an "average" pilot.

MU-2 Mandatory Training/Recurrent Training

So why is a mandatory recurrent training program now required for MU-2 pilots? For an answer, one needs to know that individual pilot training programs for the MU-2B were developed over the last 40 years by various training facilities. These programs have been loosely based on the FAA Approved Airplane Flight Manual and Pilots Operating Manual information augmented by personal experiences of the training pilot or organization.

While Mitsubishi Heavy Industries (MHI) and MHIA have always encouraged pilot training, they have not approved any one program over another. Recent FAA activity regarding the MU-2B noted a request from the operators that a standardized checklist and training program be developed so that all MU-2B pilots are trained the same way and to a level of proficiency.

At the FAA's request, MHI and MHIA, with cooperation of current training facilities, developed a flight training program that has been evaluated and approved by the FAA. This standardized program must be utilized by all MU-2 flight training facilities in the United States with the fundamental goal of reducing accidents. The FAA's Flight Standardization Board (FSB) has already set requirements for MU-2 Part 135 operators and a FAA Special Federal Aviation Regulation (SFAR) is to be released in the near future to set similar training requirements for Part 61, 91 and also 135 owner/operators.

These new training standards can be administered by any MU-2 training organization and its instructors, or by any appropriately certificated instructor who has successfully passed the training program. Additionally, instructors must meet the experience hours identified in the FSB report and SFAR.

This means that the FAA has decided to mandate a standardized training program for all pilots who fly the MU-2. This training must be conducted by MU-2 training facility instructors or individual instructors, who have received training under the FAA approved training program and meet the flight time/experience requirements for MU-2 instructors.

All of the currently active training organizations may continue to offer training services. To realize the benefits associated with the mandated FAA training, all operators must embrace it and encourage others to do likewise. As demonstrated by this recent FAA action, even a single accident reflects poorly on the entire fleet by association. Therefore, it is in the best interests of all

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Air Safety Week
ISSN 1044-727X

Access Intelligence

Editor: John Sampson
safety@iasa-intl.com
Editorial Advisor: David Evans
devans@accessintel.com
Editorial Director: John Persinos

Director of Marketing:
Jennifer Green-Holmes
jgreenholmes@accessintel.com
AVP/Publisher: Jennifer Schwartz
SVP/Group Publisher: Heather Farley
President CEO: Don Pazour

Graphic Designer: Michele White

For Advertising Call Jennifer Green-Holmes: +1-301-354-1696
Send press releases to:
John Sampson, Editor
safety@iasa-intl.com

Subscription: $1097 per year (outside North America add $99 for air mail; in CO, MD and TX, please add applicable sales tax).

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operators to assure all pilots are properly trained.

While the MU-2 has been alleged to have a higher accident rate than other complex twins, is there truth to this story? When accident statistics are reviewed by Bob Breiling, a well-known statistician who provides unbiased factual data to insurance companies, the FAA, magazines and individual inquiries, based on FAA and NTSB reports and findings, it is clear that the MU-2 does NOT have an accident rate that is "higher than any other aircraft in its class" as has been purported by critics.

Breiling utilizes fleet size and fleet hours of operation to obtain accident rates based on 100,000 hours of operation. When the MU-2 is compared with other complex twins according to the Breiling data, it most certainly does not have the highest accident rate.

Accident rates based on 100,000 hours of operation is a standard frequently used by statisticians for many modes of transportation, but there is some bias in using this methodology in determining the safe operation of an aircraft. For instance, a smaller company with few airplanes that do not rack-up millions of hours per year will seemingly have a much higher "accident rate" if they have just one accident when compared to a much larger manufacturer whose airplanes fly millions of hours.

Some will of course say that the larger company can have more accidents since their "exposure" is much higher, but is that acceptable when all manufacturers are striving for "zero" accidents?

Among considerations that are not apparent when accident rates are discussed are the following:

- What was the cause of the accident? Was it due to structural or system failure or was there a pilot decision making problem?
- What missions were being flown by the fleet of planes being studied? Were they operating in all types of weather delivering freight or canceled checks or were they flying passengers mostly in VFR settings?
- What kind of training was available and was it being used by the majority of the owner/operators?
- What kind of maintenance was being utilized?
- Generally, aircraft that sell for much more money attract owner/operators who tend to obtain better training and maintenance for their aircraft.
- Are all models of each manufacturer's airplanes being compared or have selective comparisons been made?

For instance, all 13 models of the MU-2 are usually compared with selected models of Cessna, Beech/Raytheon, Piper, Twin Commander and Swearingen airplanes. Typically, the piston engine models are not mixed in with the turboprop aircraft even though their airframes are the same.

Since the MU-2 was originally designed to be a turboprop, all 13 models are turboprops. Other manufacturers' airplanes that are typically compared with the MU-2 started as piston twins and later had turboprop engines installed as new models were introduced. Since the handling characteristics are virtually the same for the piston and turboprop variations, all models should be reviewed, not just the turboprops.

When comparisons are made in this way and when actual accidents are reviewed, not per 100,000 hours, but as raw data, the results show that the MU-2 series definitely does not deserve such a "tainted" reputation.

More MU-2 Facts

- The Mitsubishi MU2 is a cabin-class, twin-engine, propeller-driven business aircraft produced between 1967 and 1985. The aircraft can carry 7-10 people in executive configuration, and is used to carry both passengers and cargo.
- Despite ceasing production of the MU-2 in the 1980s, the aircraft boasts multi-million dollar support, in the form of state-of-the-art simulator training facilities at SimCom, Orlando, Florida, and, biannual "Pilot's Review of Proficiency" Safety Seminars.

All of these aggressive efforts have played a large part in making the MU-2 the safest aircraft in its class today.

Unabridged copy of this MHIA input is at tinyurl.com/25kwvu. ✈