Message from Flight Safety Officer

Vision Air International is highly proud to be having carried out successful international Charter Operations for last six years. Apart from fleet of B737s, last year we got a B747-200F aircraft on our AOC.   With the induction B747 in to our fleet we have carried out plenty of cargo flights around the globe. By the grace of Allah Almighty, Vision Air International is in the process of inducting more B747s in to its fleet. The induction of more B747s in to our fleet is going to make Vision Air International a leading international Charter operator in Pakistan with the capacity of further expansion of its business. Vision Air has also began air operations from Dubai. Vision Air International's stands up to the required international quality/safety and operational standards, as it has recently received an exceptional audit evaluation report from MBA, which is one of the world's seven leading auditor companies approved by IOSA. Vision Air audit by MBA was a third party audit, which was done on the expanses of our international client " The NAC" (National Air Cargo) from USA, which is extending air freight service to US lead NATO Forces around the globe.

With the increase in intensity of our flight operations with international community, we are seriously concerned to our flight safety and quality assurance program. Our Company's ultimate goal is to be safe and efficient. To keep our safety and quality standards Vision Air has incorporated in its Safety management program the independent operational and line management activities, which are being closely monitored to identify operational hazards. We also have the process for investigation for internal irregularities, non-conformities, significant safety issues to identify hazards and to arrange corrective training for our crew and staff to avoid human factors.

By:
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JUST BECAUSE YOU ALWAYS DID IT THAT WAY, DOES NOT MAKE IT RIGHT WAY. DON'T FORGET CRM IS THE MOST IMPORTANT COMPONENT IN ACHIEVING FLIGHT SAFETY.

Some have eyes and cannot see, some have ears and cannot hear, so let's be wise to welcome advice. Some wise men worked on CRM, which meant you carry with you your entire team and make use of the most of their due ability to achieve safety and that is why CRM is so important. Why I am making this effort to write about CRM, because in recent days I have made observations that some professionals with tens of thousands of flying hours just do it that way because they have been doing it that way and don't care the importance of CRM in modern aviation industry. CRM was initially known as cockpit resource management, but as CRM programs evolved to included cabin crews, maintenance personnel, and others, the phrase crew resource management was adopted. CRM is the fundamental part of all operation within aviation in order to achieve and maintain safety within aviation. It is therefore vital for the crew to apply CRM essentials in all phases of flight. The most important part of CRM is the team management concepts in the flight deck environment. The pilots of small aircraft, as well as crews of larger aircraft, must make effective use of all available resources; human resources, hardware and available information to achieve better safety results. Current definition includes all groups routinely working with the flight crew who are involved in decision making to achieve better flight safely environment. These groups include, but are not limited to pilots, dispatchers, cabin crewmembers, maintenance personnel, and air traffic controllers. CRM is one way of addressing the challenge of optimizing the human/ machine interface for the safe and efficient conduct of a flight. After critically observing number of accidents and incidences the most crucial factors, which lead toward mishaps has been identified as follows:

Individualism; individual behavior, has significant influence other crew members in the same cockpit. Specifically, when there is a communication gap or a crew member tries to take actions at his own, without unfolding his intentions to other crew members.

Power distance, where less powered members of the crew becomes helpless even if they are correct in their professional approach.

Ego problem, where 'I' or self of an individual plays an adverse role. A person thinks and feels as distinguished from others members of the team and begins to work or act in his own way.

Poor knowledge or disregard to SOPs. Factually SOPs, describe individual crew duties as supplement to Flight Crew Operation Manual, QRH and APM. SOPs are considered safe practices and shall be strictly followed and adhered to by all crew members. If the crew members disregard SOPs, it degrades mission efficiency and causes confusion in the cockpit, which may cause flight safety hazards.

Captain has the primary duty to emphasized adherence to SOPs through pre flight briefing. In unusual circumstances Captain has the authority to vary these procedures; however he is required to announce his intentions while doing so.

Note: The key to safe and efficient conduct of flight lies in pre-flight briefings and after-flight debrief to aircrew and other concerned staff including representatives of handling agents, covering salient administrative and operational aspect of the flight.

FUEL CONSERVATION TECHNIQUES

Fuel conservation is a significant concern of every airline. An airline can choose an approach procedure and flap setting policy that uses the least amount of fuel, but it should also consider the trade-offs involved with using this type of procedure. The descent and approach phases of flight give pilots the opportunities to reduce fuel consumption during flight. By carefully planning the airplane's descent and appropriately using drag and high lift devices a smart pilots can ensure a safe landing while saving fuel. Decisions to select type of approach vary with each airline, for each flight and for each pilot. In purely pilot's point of view the strategies for saving fuel during the descent and approach phases of flight depends upon Cost Index, speed schedule, use of thrust settings, distance to go from TOD (top of descend) to intended landing runway, use of drag devices during descend and flaps setting for landing. A correctly flown descend offers a considerable opportunity to the pilot to save fuel. The ideal fuel saving descend is made by flying in clean configuration at optimum speed and maintaining idle thrust down to final approach from where onward a tickle of power as required to maintain reference speed for landing. The reduced flight time is also a factor in fuel economy, so in B747 descend shall be simply planned at idle thrust/300 KTS with little speed variations to maintain the desired descend profile. Throughout descend the pilot must keep in mind the track miles to touchdown, monitor the wind component and adjust the profile accordingly. A pilot, who is either unfamiliar with techniques of fuel saving or not enthusiastic to know it, lacks professional competence. Therefore, I have made an effort to discuss the low-drag or delayed-flaps approach in the below paragraphs for the understanding of every Vision Air pilot.

LOW-DRAG OR DELAYED-FLAPS APPROACH

If there are no adverse conditions while an approach is not being conducted the final flap selection may be delayed until just prior to 1,000 feet above field elevation (AFE) to conserve fuel unless requested by ATC to maintain low speeds with flaps down to accommodate other aircraft in the sequence. This approach is known as a low-drag, delayed-flaps, or noise-abatement approach. The actual steps to use vary by airplane model and are described in the FCOM, flight crew training manual and in airline standard operating policy. The general steps for low-drag approach are:

- Intercept the glide slope with gear down and half of the landing flaps till 5NM to landing runways. This will ensure nearly idle thrust setting till making it a stabilized approach.
- While approaching 1,000 feet above field elevation, select landing flaps, reduce the speed to the final approach speed, and then adjust thrust to maintain it and perform final landing checklist.

FUEL SAVING ASSOCIATED WITH DELAYED-FLAPS APPROACH

The delayed-flaps approach uses 10 to 150 kilograms of lesser fuel than the standardize approach with the same flap setting. However these should only be conducted in conditions that do not make it difficult to achieve a stabilized approach criteria. Depending on the flap setting and airplane movement the seven key points should be considered when planning an approach and descent to minimize fuel consumption and these points are:

- Plan decent carefully.
- Start decent at proper point
- Fly most economical speeds
- Use idle thrust for decent
- Avoid flying extended periods at low altitudes
- Configure flaps and gears for landing at optimal time
- Use most appropriate final flap setting for landings.

DANGERS OF FLYING IN OR CLOSE TO A THUNDERSTORM

1. TURBULENCE. Turbulence, associated with thunderstorms, can be extremely hazardous, having the potential to cause overstressing of the aircraft or loss of control. Thunderstorm vertical currents may be strong enough to displace an aircraft up or down vertically as much as 2000 to 6000 feet. The greatest turbulence occurs in the vicinity of adjacent rising and descending drafts. Gust loads can be severe enough to stall an aircraft flying at rough air (maneuvering) speed or to cripple it at design cruising speed. Maximum turbulence usually occurs near the mid-level of the storm, between 12,000 and 20,000 feet and is most severe in clouds of the greatest vertical development.Severe turbulence is present not just within the cloud. It can be expected up to 20 miles from severe thunderstorms and will be greater downwind than into wind. Severe turbulence and strong outflowing winds may also be present beneath a thunderstorm. Microbursts can be especially hazardous because of the severe wind shear associated with them.
2. LIGHTNING. Static electricity may build up in the airframe, interfering with operation of the radios and affecting the behavior of the compass.. Lightning blindness may affect the crew's vision for 30 to 50 seconds at a time, making instrument reading impossible during that brief period. Lightning strikes of aircraft are not uncommon. The probability of a lightning strike is greatest when the temperature is between -5ºC and 5°C. If the airplane is in close proximity to a thunderstorm, a lightning strike can happen even though the aircraft is flying in clear air. Lightning strikes pose special hazards. Structural damage is possible. The solid state circuitry of modem avionics is particularly vulnerable to

lightning strikes. Electrical circuits may be disrupted. The possibility of lightning igniting the fuel vapor in the fuel cells is also considered a potential hazard.

3. **Hail.** Hailstones are capable of inflicting serious damage to an airplane. Hail is encountered at levels between 10 and 30 thousand feet. It is, on occasion, also encountered in clear air outside the cloud as it is thrown upward and outward by especially active cells.
4. **Icing.** Heaviest icing conditions occur above the freezing level where the water droplets are supercooled. Icing is most severe during the mature stage of the thunderstorm.
5. **Pressure.** Rapid changes in barometric pressure associated with the storm cause altimeter readings to become very unreliable.
6. **Wind.** Abrupt changes in wind speed and direction advance of a thunderstorm present a hazard during take-off and landing. Gusts in excess of 80 knots have been observed. Very violent thunderstorms draw air into their cloud bases with great intensity. Sometimes the rising air forms an extremely concentrated vortex from the surface of the ground well into the cloud with vortex speeds of 200 knots or more and very low pressure in its center. Such a vortex is known as a tornado.
7. **Rain.** The thunderstorm contains vast amounts of liquid water droplets suspended or carried aloft by the updrafts. This water can be as damaging as hail to an aircraft penetrating the thunderstorm at high speed. The heavy rain showers associated with thunderstorms encountered during approach and landing can reduce visibility and cause retraction on the windscreen of the aircraft, producing an illusion that the runway threshold is lower than it actually is. Water lying on the runway can cause hydroplaning which destroys the braking action needed to bring the aircraft to a stop within the confines of the airport runway. Hydroplaning can also lead to loss of control during take-off.

ST. ELMO'S FIRE

If an airplane flies through clouds in which positive charges have been separated from negative charges, it may pick up some of the cloud's overload of positive charges. Weird flames may appear along the wings and around the propeller tips. These are called St. Elmo's Fire. They are awe-inspiring but harmless.

THUNDERSTORM AVOIDANCE

Because of the severe hazards enumerated above, attempting to penetrate a thunderstorm is asking for trouble. In the case of flight, airplane pilots, the best advice on how to fly through a thunderstorm is summed up in one word—DON'T.

Detour around storms as early as possible when encountering them enroute. Stay at least 5 miles away from a thunderstorm with large overhanging areas because of the danger of encountering hail. Stay even farther away from a thunderstorm identified as very severe as turbulence may be encountered as much as 15 or more nautical miles away. Vivid and frequent lightning indicates the probability of a severe thunderstorm. Any thunderstorm with tops at 35,000 feet or higher should be regarded as extremely hazardous. Avoid landing or taking off at any airport in close proximity to an approaching thunderstorm or squall line. Micro bursts occur from cell activity and are especially hazardous if encountered during landing or take-off since severe wind shear is associated with microburst activity. Dry micro bursts can sometimes be detected by a ring of dust on the surface. Virga falling and evaporating from high based storms can cause violent downdrafts. The gust front, another zone of hazardous wind shear, can be identified by a line of dust and debris blowing along the earth's surface. Swirls of dust or ragged clouds hanging from the base of the storm can indicate tornado activity. If one tornado is seen, expect others since they tend to occur in groups. Do not fly under a thunderstorm even if you can see through to the other side, since turbulence may be severe. Especially, do not attempt to fly underneath a thunderstorm formed by orographic lift. The wind flow that is responsible for the formation of the thunderstorm is likely to create dangerous up and down drafts and turbulence between the mountain peaks.

Reduce airspeed to maneuvering speed when in the vicinity of a thunderstorm or at the first indication of turbulence. Do not fly into a cloud mass containing scattered embedded thunderstorms unless you have airborne radar. Do not attempt to go through a narrow clear space between two thunderstorms. The turbulence there may be more severe than through the storms themselves. If the clear space is several miles in width, however, it may be safe to attempt to fly through the center, but always go through at the highest possible altitude. When flying around a thunderstorm, it is better to fly around the right side of it. The wind circulates anti-clockwise and you will get more favorable winds. If circumstances are such that you must penetrate a thunderstorm, the following few simple rules may help you to survive the ordeal:

- Go straight through a front, not across it, so that you will get through the storm in the minimum amount of time.
- Hold a reasonably constant heading that will get you through the storm cell in the shortest possible time.
- Before entering the storm, reduce the airspeed to the airplane's maneuvering airspeed to minimize structural stresses.
- Turn the cockpit lights full bright. (This helps to minimize the risk of lightning blindness.) Check the Pitot Heat ON, Fasten seat belts and Secure loose objects in the cabin.
- Try to maintain a constant attitude and power setting. (Vertical drafts past the pitot head and clogging by rain cause erratic airspeed readings.)
- Avoid unnecessary maneuvering (to prevent adding maneuver loads to those already imposed by turbulence).
- Determine the freezing level and avoid the icing zone. Avoid dark areas of the cell and, at night, those areas of heavy lightning.
- Do not use the autopilot. It is a constant altitude device and will dive the airplane to compensate for updrafts, causing excessive airspeed, or will cause the plane to climb in a downdraft creating the risk of a stall.

STORMSCOPE

An instrument known as a storm scope, installed in the airplane, can help a pilot avoid thunderstorms. The storm scope detects the electromagnetic discharges associated with vertical air currents. All thunderstorms contain strong updrafts and downdrafts. These opposing ascending and descending air currents rub against each other, generating static electricity. The electrons tend to accumulate in positive and negative charges and when they have built up sufficiently, the potential difference will cause a current discharge. This discharge manifests itself not only as lightning but also in the radio spectrum. The storm scope picks up the radio frequencies from these discharges; a computer processes the signals, plots them by range and azimuth and presents them on a small, circular, radar like screen. The static electrical discharges picked up by the storm scope may or may not be associated with lightning. The storm scope receives these signals through 360 degrees around the airplane and from as far away as 200 nautical miles. Each static discharge is represented by a bright green dot on the cathode ray tube display. Clusters of dots indicate areas of thunderstorm activity. The display can be programmed to different range settings up to 240 miles. It is most accurate on the low range from 40-80 miles. Generally, the display is more accurate and easier to read as the storm intensifies. In heavy electrical activity, the system has a problem called radial spread. The dots tend to spread over the display screening the areas between major clumps of storm caused dots. The storm scope has some advantages over weather radar. Radar measures rainfall intensity. The storm scope is capable of detecting turbulence in clouds that have little or no precipitation. It is also able to see through areas of heavy precipitation to detect turbulent areas beyond. A storm scope does not, however, see rain. The storm scope is not dependent on line of sight. It will see, for example, the weather behind mountains. The system can therefore, be used on the ground to determine weather for a 240 mile radius and is a useful flight planning tool.

WEATHER RADAR

Airborne weather radar is one of the best instrument aids that a pilot can have in locating and avoiding thunderstorms. It is able to detect and display on the cockpit radar screen any significant weather that lies ahead on the flight route. The radar equipment does this by measuring precisely rainfall density of targets under observation. The antenna of the weather radar radiates a very narrow and highly directional beam, in the X band of the radio spectrum, straight ahead of the aircraft. The beam is cone-shaped and from 3 to 10 degrees in diameter. (Beam width is a function of antenna size and type.) The antenna scans left and right to cover a sector of about 120 degrees. Although, weather radar is not able to detect turbulence itself, the intensity of precipitation within a storm is a reliable indication of the amount of turbulence within a storm since strong drafts and gusts are necessary to produce water drops of significant size and quantity. The computerized receiver measures the rainfall rate and grades the targets into levels which are represented on the screen by colors, green for level 1 which is light rain, yellow for level 2 which is medium rain and red for level 3 which is heavy rain. Areas of steep rain gradients are easy to see because of the color coding. A precipitation rate that changes from minimum to maximum over a short distance is known as a steep rain gradient and usually is associated with a shear zone. Any target that is showing red, said to be contouring, is considered to be a storm and must be avoided and detoured. Areas of no precipitation between targets remain black and are called corridors. The airborne display is gradated into mileage rings. Distance to the storm as well as its bearing with respect to the airplane's heading are therefore displayed. As a result, the pilot is able to select a safe and smooth flight path through thunderstorm areas. It is wise to give all contouring targets at least a ten mile clearance. A corridor between 2 targets should be at least 20 miles wide before considering it a safe passage. When an airplane, while flying at a level where the temperature is at or below freezing, strikes a super cooled water droplet, the droplet will freeze and adhere to the airplane. Dangerous icing can occur in clouds, freezing rain, or freezing drizzle. The cloud in which icing most frequently occurs in winter is stratocumulus, but the heaviest deposits are encountered in cumulus and cumulonimbus. Clouds composed of ice crystals (such as cirrus) do not present an icing hazard. (The ice crystals do not adhere to the wing.) The more dangerous types of icing are encountered in dense clouds, composed of heavy accumulations of large super cooled drops, and in freezing rain. The seriousness of icing depends on the air temperature, the temperature of the aircraft skin and the amount of water striking the aircraft. A super cooled water droplets freeze if disturbed. When struck by an aircraft, the drops begin to freeze immediately, but as they freeze, they release heat to raise its temperature to 0°C. Freezing by impact then ceases and the remaining liquid in the drop begins to freeze more slowly as a result of cold surroundings. At very low temperatures, a large part of the drop freezes by impact. At higher temperatures, a smaller part of the drop freezes by impact leaving a greater amount to freeze more slowly. How fast this liquid part of the drop freezes depends on the temperature of the aircraft skin. The higher the temperature, the more the drop will spread from the point of impact before freezing is complete.

ICING

The size of droplets also affects the rate of catch. Small drops tend to follow the airflow and are carried around the wing. Large, heavy drops tend to strike the wing. When a small drop does hit, it will spread back over the wing only a small distance. The large drop spreads farther. As for airspeed, the number of droplets struck by the aircraft in a certain time increases as the airspeed increases. The curvature of the leading edge of the wing also has an effect on the rate of catch. Thin wings catch more droplets than do thick wings. The rate of catch is, therefore, greatest for an aircraft with thin wings flying at high speed through a cloud with large droplets and a high liquid water content.

HOW ICING AFFECTS THE AIRPLANE

Ice collects on and seriously hampers the function of not only wings and control surfaces and propellers, but also windscreens and canopies, radio antennas, pilot tubes and static vents, carburetors and air intakes. Turbine engines are especially vulnerable. Ice forming on the intake cowling constricts the air intake. Ice on the rotor and starter blades affects their performance and efficiency and may result in flame out. Chunks of ice breaking off may be sucked into the engine and cause structural damage. The first structures to accumulate ice are the surfaces with thin leading edges: antennas, propeller blades, horizontal stabilizers, rudder, and landing gear struts. Usually the pencil-thin outside air temperature gauge is the first place where ice forms on an airplane. The wings are normally the last structural component to collect ice. Sometimes, a thin coating of ice will form on the windshield, preceded in some instances by frosting. This can occur on take-off and landing and with sufficient rapidity to obscure the runway and other landmarks during a critical time in flight. Icing of the propeller generally makes itself known by a slow loss of power and a gradual onset of engine roughness. If the propeller is building up ice, it is almost certain that the same thing is happening on the wings, tail surfaces and other projections. The weight of the accumulated ice is less serious than the disruption of the airflow around the wings and tail surfaces. The ice changes the airfoil cross section and destroys lift, increases drag and raises the stalling speed. At the same time, thrust is degraded because of ice on the propeller blades and the pilot finds himself having to use full power and a high angle of attack just to maintain altitude. With the high angle of attack, ice will start to form on the underside of the wing adding still more weight and drag. Landing approaches and landing itself can be particularly hazardous under icing conditions. Pilots should use more power and speed than usual when landing an ice-laden airplane. If ice builds up on the pilot tube and static pressure ports, flight instruments may cease operating. The altimeter, airspeed and rate of climb would be affected. Gyroscopic instruments powered by a venturi would be affected by ice building up on the venturi throat. Ice on radio antennas can impede VOR reception and destroy all communications with the ground. Whip antennas may break off under the weight of the accumulating ice.

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