

INSIDE THIS ISSUE

2005 International Society of Air Safety Investigators What You Should Know About Your Eyes Fixing the Workplace Not the Worker This year the International Society of Air Safety Investigators (ISASI) 2005 was held in downtown Fort Worth Texas. Fort Worth catered to some four hundred delegates from all around the world to include: Brazil, China, Switzerland and many numerous attendees from various companies and countries.

Tuesday the 13th the conference kicked off with a big Texas bang starting with delegates attending a multitude of presentations to include, "Challenges in the Afghan Investigation of the KAM Air Flight 904" presented by Bob Benzon, and "Accident, Serious Incident, and Incident Investigations: Different Approaches, The Same Objective" presented by Stephanie Corcos and Pierre Jouniaux. Tuesday night then concluded with an ol'fashion Texas time. Everyone was invited to attend Billy Bob's. This is a local tourist attraction which symbolizes Texas's heritage. While enjoying Texas BBQ we were presented with some live entertainment. The team at Billy Bob's put on a nice TX skit for all to enjoy. We all became a little more cultured after that presentation.

Wednesday was filled with much of the same, presentations, company mingling as well as fostering international relations among each other. Here is just a small sample of what some of the papers discussed: "Flight Data Monitoring-A New Approach", presented by Simone Sporer, "Airline Flight Data Analysis (FDA) – The Next Generation", presented by Jill Sladen and Mike Poole.

Thursday was the final wrap of the conference. The last of the presentations were made and the evening wrapped up with a mingling session followed by a wonderful closing reception. The reception closed with where the next ISASI conferences would be located, honored sponsors, and acknowledged many thanks to everyone who had contributed to the great success of this year's conference.

Next year ISASI 2006 will be hosted in Cancun Mexico on September 11-14th. The theme will be "incidents to Accidents Braking the Chain". The accommodations for next year will be hosted by the beautiful Fiesta Americana Grand Coral Beach Hotel. Please note that the cut off date for reservations will be August 11, 2006. Anyone who books after this date is subject to availability. Please check for the latest "ISASI 2006" information at the ISASI Web Site transmission or accommodation.

Important dates for ISASI 2006

- Call for Papers Target Dates
- Indication of interest January 31, 2006
- Abstracts due: March 31, 2006
- Selected papers due in electronic format: July 31, 2006

Please e-mail or mail abstracts and final papers to:

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E-Mail: papers@rogers.com Tel:: 613-736-1491

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The human eye: perhaps one of the most complex and necessary components of a pilot. For the most part it is correct to say that all pilots require both eyes. However there have been cases where individuals have earned their pilots license with only one eye functioning.

In this article we will discuss the following but are not limited to: the anatomy of the eye, the visual system, accommodations, age accommodations, adaptation to light, visual acuity, visual fatigue and many other areas of importance.

Lets first start with the greatest importance of our human eye, the anatomy. The anatomy of our eye consists of the following: retina, fovea, and rods and cones.

It has been noted that sight is one of the most active intake systems on our body. Some 70% of all our body's receptors are the specialized photosensitive cells of our eyes. It has been estimated that a third of all the fibers bringing impulses to the central nervous system come from the eye. Let's look at an easy way to understand the eye. We can do this by comparing its nature to that of a 35mm camera. If you take the pupil, with its variable aperture, the transparent cornea and the adjustable lens represent the optics of the camera. The cornea and lens together refract the rays that are incoming and then bring them into a focus on the retina. This represents light-sensitive film.

The Human Eye Anatomy:

Note: When light enters the eye, it passes through the pupil, cornea, and lens, and is focused on the third tunic of the eye, called the neural tunic.

Retina: This is where the visual receptors are located. The actual receptor organs are the visual cells embedded in the retina, consisting of "cones" for color vision in bright light. It also houses the "rods" which are used for vision in dim light. The rods are highly sensitive. The visual cells then convert the light energy by a photochemical reaction into nervous impulses which are then transmitted along the fibers of the optic nerve.

Rods and Cones: Outside of the foveal area there are considerably fewer cones and one nerve fiber serves several rods and cones. Here is where the rods are distinctly more abundant than cones and they become more numerous as they are located farther from the fovea. The cones themselves detect fine differences in either color or shape but need high illumination for this. Rods are more sensitive even when it comes to dim light, but they only distinguish between shades of grey between black and white. The rods are the most important out of the two for light-detecting organs in poor visibility and at night.

Fovea: The human eye contains some 130 million rods and 7 million cones. A thin covering called the "fovea centralis" allows the light rays to pass directly to the visual cells, which, in the fovea, consist entirely of cones, this is where the maximum density of about 10,000 cones per mm2 are located. Each foval cone has its own fiber connecting it to the optic nerve. Because of this the fovea has the highest resolving power of any part of the retina, up to about 12 s of arc. The area of the center vision is accomplished here in the fovea. It is important to note that only objects that are focused on the fovea come into complete focus.

Visual Field: The visual field is that part of one's surroundings that is taken in by the eyes when both eyes and head are held still. Only those objects within the small cone of 1 degree apex are focused sharply. If you were to keep your eyes still while reading you would only be able to see a few letters at a time.

The Visual Field can be divided up into 3 segments as follows:

- 1. Area of Sharp Vision Viewing angle 1 degree
- 2. Middle Field: Viewing Angle 40 degrees
 - The middle field areas are not seen clearly but strong contrasts and movements are noticed.
- 3. Outer Field: Viewing Angle 40-70 degrees

The Outer Field is bounded by the forehead, nose and cheeks; objects in this area are hardly noticed unless they move.

Accommodation: This simply means the ability of the eye to bring into 'sharp focus' objects at varying distances from infinity down to the nearest point of distinct vision. More notably known as the 'near point'. For example, when you were a child and you would make your eyes become crossed. What you most likely noticed was that your nose became the clearest object that you could focus on, but the objects in the distance became blurred. This is a clear demonstration of what accommodation is and how it works. The reason that we see our nose differently is because an object is seen clearly only when refraction through the cornea and lens produces a tiny but sharp image on the retina, the three components forming an optical system. "You may ask "how do we focus on the object near by"? The viewing is achieved by changing the curvature of the lens, by contraction of the muscles of accommodation, the ciliary muscles.

Distant Objects: How do we see distant objects? When the ciliary muscles are relaxed, the refraction of cornea and lens is such that parallel rays from distant objects are focused onto the retina. Therefore, when attention is allowed to wander over distant objects, the eyes are focused on 'infinity' and the ciliary muscles remain relaxed.

Age and Accommodation: Age we all know has a profound impact on our bodies, but what we may not understand is that age has an enormous effect on the eyes ability to accommodate. The reason for this is that the lens gradually loses its elasticity.

Visual Fatigue: This usually comprises of all the following symptoms following excessive stress on any function of the eye. One of the most important of these strained is the ciliary muscle of accommodation. This is usually caused by looking to closely at very small objects and the effects of strong local contrasts on the retina. Typical signs that you are expressing visual fatigue are in the following list; however this list is not inclusive:

- 1. Painful irritation (burning) followed by tearing, redness of the eye and conjunctivitis.
- 2. Double vision
- 3. Headaches
- 4. Reduced powers of accommodation and convergence

5. Reduced visual acuity, sensitivity to contrast and speed of perception. These symptoms are brought about in particular by strenuous fine work, reading poorly printed texts or low-quality computer images, inadequate lighting, exposure to flickering light or optical aberrations of the viewer's eyes. Elderly people are, of course, more prone to visual fatigue.

Obviously, all types of visual work can contribute to the general fatigue discussed earlier since every job that calls for more rapid and precise eve movements will make heavier demands on perception, concentration and motor control. So whenever the eyes are overstressed for long periods the symptoms of eyestrain (sore eyes and headaches) will be added to those of general fatigue.

The effects of visual fatigue on a person's occupation may include the following:

Loss of productivity Lowering of quality More mistakes Increased accident rate Visual complaints.

Why should I know all this information about my eyes you ask? It is simple, for the majority of audience viewing this paper it is not incorrect to assume that most people at least have a private pilot's license. It is also worth saying that most of those who possess this luxury do not want to loose it due to eve failure. Therefore it is critical to understand your body and all of its functions. By educating yourself about your body's functions you are more likely to take care of them as well as learn to prevent damage from occurring to them.

It is critical that you maintain healthy eye care. When you consider all that you have put into your career it seems to minor to just remember these following helpful hints:

When viewing a computer remember to take mini-breaks and look away for a few minutes.

Remember to stay hydrated; this will help your eyes stay hydrated.

If you seem to be straining or 'squinting' to read you should have your eyes checked by a certified optometrist.



Remember that your eyes are your

Reference: Anatomy Workbook, Edward Alcamo, Ph.D



<u>Fixing the Workplace, Not the Worker</u> <u>A Workers' Guide To Accident Prevention</u>

Let's talk about "fixing the workplace, not the worker". We can look at a program called TOP, or Triangle of Prevention Program. The program centers on fixing the workplace, and not the worker. This is done through creating and effective safety system. You may ask what has motivated all this concern in changing the workplace not the worker. Well typically, the accident prevention has been defined by management as an individual workers responsibility. Here the employee involvement safety programs are based on behavior modification. The goal is to reduce the OSHA recordable injury rate by changing the behaviors of workers. What has come of all this you may wonder. Well the union often creates a name for their local program. Management may even agree to not use discipline when unsafe behavior is observed. However we have seen that behavior modification safety programs are a perfect fit of management's avoidance of responsibility for health, safety and accidents. When management runs process units beyond factory design limits, reduces preventative maintenance staff, crowds equipment together, hires poorly trained contractors and downsizes safety budgets, these unsafe management behaviors are ignored by behaviorist safety programs.

Behavior modification programs are the least effective way to prevent accidents because they focus on the narrow issue of correcting worker mistakes. When the Health and Safety Committees investigated the injury using a fix the workplace, safety system approach, the committee saw that the worker's injury was a symptom of a problem with the facility's internal workings. Behavior modification programs assume that the workplace and its safety systems are designed and maintained safely. Behavior observation programs actually function as a means of convincing workers to adapt their behaviors in order to keep unsafely designed equipment running. Behavior modification programs concentrate on getting workers to adapt themselves to the unsafe equipment by wearing fall protection harnesses or other personal equipment. Rather than focusing worker attention on organizing collectively to fix the workplace, behaviorbased programs have workers target each other for individual change.

Now we can look more towards the workplace. When we view the workplace and "fixing" it we usually take on the attitude of, when a pump fails it is recognized that the thing that actually broke down was the plant's mechanical integrity program. The key for prevention of future similar incidents requires examining and changing the mechanical integrity system. Therefore, attention focuses on issues such as why the pump-monitoring program did not detect a problem with the bearing.

Now the question may possibly be how do we create a safer workplace? This truly requires us to look at industrial health and safety in a fundamentally new way. After all, our entire society is based on blaming the victim. The national focus on individual recycling concentrates our attention on the least effective area for actually reducing pollution. However, it is very effective in transferring blame and responsibility for pollution onto working people and away from corporations who create, control and profit from the system of pollution.

So in conclusion the workers are the problem that needs fixing in order to have a safe workplace. They claim that the behavior modification of individual workers is the solution. In reality, unsafely designed, maintained and managed workplaces are the primary problem. The best way to prevent injuries, fires, explosions and hazardous material releases is by fixing the workplace, not the workers.

Reference: Fitting The Task To The Human, K.H.E. Kroemer and E. Grandjean



Aug Islander 21	ZS-PCJ	Private	0	South Africa
	Crashed into a l	house shortly after	initiating a go arou	nd.

Aug 23	Boeing 737-200	OB-1809-P	TANS	40	Puru
		TANS Flight 204 o callpa. After an int While approaching ing cumulus cloud crash-landed in sw of fatalities and oc killed and one pass ever that the numb the number of fata TANS.	departed Lima at 14:24 termediate stop there the g Pucallpa meteorologies and strong winds. Why ampland. There are co ecupants. Official source senger missing, presum- per of occupants was co lities was reported as 4	on a scheduled 53-min the airplane was to contri- cal conditions deteriora nile approaching runwa nflicting reports regard es say 44 out of 100 oc hed killed. Local media prected from 100 to 98 0. These figures are co	nute flight to Pu- inue to Iquitos. ated with tower- ay 02 the 737 ling the number ccupants were reported how- by TANS and onfirmed by

Sep 01	Falcon 20	N821AA	USA Jet Air- lines	0	USA
1	North Cart	At Lorain the Falcor at a height of about 1 way swarmed in from a complete loss of po- the landing gear. The the gas producer (NI stall warning horn so plane contacted the r gear retracted, about runway, struck a fen beyond the initial po-	n was loaded with 380 pouls 15 feet above the runway, nt of the aircraft and inges ower on the number two e e airplane climbed for about 1) gauge on the number of bunded, and the pilot adju runway straight and level 53,000 feet beyond the poils ce, crossed a road, and ca bint of ground contact.	ands of cargo. After rotati a flock of birds from bot sted birds into both engine- engine. The pilot then call but 10 seconds, before the ne engine decay through 3 sted the flight controls fo at approximately 130 kno int of rotation. The airpla me to rest in a cornfield a	ion fro runway 25 h sides of the run- es. This resulted in led for retraction of copilot observed 50 percent. The r landing. The air- ots, with the landing ne overran the about 1,000 feet

Sep 04	Antonov 2	RA-00091?	Polyot Aeroclub	3	Russia
		The Antonov 2 sia's Sports & T Ekimchan to Cl Udskoye and w storms made se found after a 12 (1,550 m) of the	plane, belonging to Fechnology Society humikan via Udsko vas declared missing arching for the plar 2-day search. The ai e Selemja range.	the Amur organiz was charted for a f ye. The airplane ne g. Low clouds, rain he difficult. The wr ircraft had flown in	ation of Rus- flight from ever arrived at and thunder- eckage was to Mt. Bryus

Sep 05	Boeing 737-200	PK-RIM	Mandala Airlines	102	Indonesia
		Crashed in a resi fatalities is uncer the rear of the pl said to have beer Water around the 050300Z 15006H South-Southeast perature 30 deg. Medan-Polonia h	dential area 500 meto rtain. Latest reports sc ane had survived, who h killed. e time of the accident XT 5000 SCT016 30/ at 6 kts, Scattered cl C, dewpoint 25 deg. has a single 2900 x 43	ers past the runway. 7 ay 15 passengers whi ile 47 persons on the (02:40 UTC) was: V 25 Q1008 NOSIG= ouds at 500 m/1600 f C, 1008 hPa). 5 meters asphalt runy	The number of o were seated in e ground are WIMM (winds from the ft MSL, tem- way (05/23).

Sep 05	Antonov 26	ER-AZT	Kavatshi Airlines	11	D.R. Congo
www-8	wiation-safety.net	The Antonov st to land at Isiro. in fog as the acc belonged to the ing business as	ruck a tree, crashed The aircraft was re cident happened. N private company C Kavatshi Airlines.	l and caught fire wi portedly approachi ews reports state th Galaxie which was	hile coming in ng runway 31 hat the plane reportedly do-

Sep 08	DHC-6 Twin Otter	9Q-CBO	TMK Air Commuter	0	D.R. Congo
		Powerless after landing in a bar Some three occ serious damage impact.	takeoff forced the nana field. The airc upants sustained in to the fuselage. A.	crew to carry out a raft carried about 1 juries. The Twin O o. the right wing br	n emergency 5 passengers. tter sustained oke off in the

Sep 09	Islander	PK-VIA	Dirgantara Air Services	0	Indonesia
09		The Islander cr complex in San ing flight.	ashed into a softbal narinda. It was on t	l field located in th he fourth approach	e Segiri sports during train-

Sep 09	Antonov 26	9Q-CFD?	Air Kasai	13	Congo
-		An Antonov fro ville as it was f shasa. There is some u plane. Sources a	om Air Kasai crash lying from Equator incertainty with reg also report that the	ed in neighboring C province in the No gards to the exact ic ill-fated aircraft wa	Congo Brazza- orth to Kin- lentity of this as msn 10605.

Sep 12	DHC-8	HK-4030X	AIRES Colombia	0	Colombia
		The flight was l portedly a socia wheel chair had surrendered to a	hijacked by a man i al security benefit a l been turned down authorities at 17:05.	n a wheel chair and pplication by the m by the Council of S	d his son. Re- an in the State. They

Sep 15	Citation Jet	PT-WLX	Ciacao Cometa	2	Brazil
	A MARINE R	The aircraft cra neiro	shed into dense for	est in the outskirts	of Rio de Ja-

Sep 19	Metro	PH-DYM	Dynamic Air	0	Netherlands
-		The airplane att the right side of	tempted to take off f the runway. The la	from runway 24 waanding gear collaps	hen it ran iff ed rearwards.

Sep 21	Airbus A.320	N5236JB	JetBlue Airways	0	USA
		The flight crew a caution light u Burbank. The n to divert to Los safely at Los An were completel	of JetBlue 292 rep upon retracting the lose wheels were tu Angeles. After bun ngeles three hours a y destroyed.	ortedly observed il landing gear after t rrned 90 degrees. It rning off fuel the ai after takeoff. The n	lumination of akeoff from was decided rcraft landed ose gear tires



The Antonov plane operated on a flight from Kasese to Bukavu. It was chartered by the Decilac company which is based in Bukavu. The aircraft is understood to have encountered a heavy thunderstorm and crashed in mountainous terrain. The female passenger survived the accident, the Armenian pilot and Congolese copilot were killed in the accident. The exact Antonov model involved in the accident has not yet been confirmed.

Sep 24	Boeing 707	96-0042	USAF	0	USA
4		The aircraft wa Northrop Grum	s extensively dama man facility.	ged by Hurricane 'I	Rita' at the

Sep 26	G-159 Gulfstream	YV-1020	?	0	Colombia	
2	A Street	The G-159 was detected on an illegal airstrip by Colombian A Force planes. Two tons of cocaine were being loaded onto the when the two Cessna A-37 Dragonfly jets and a Bell 212 Rapa helicopter destroyed the runway as well as the airplane. The air was considered damaged beyond repaired and set afire by the thorities.				

Sep 30	Citation II	N77ND	Univ. of North Dakota	0	USA
		The Citation II res flight. While in in: about seven-eights cled the deice boo pilot heard a loud An emergency des gines. At an altitud lected a fairly clea retracted. The airp empennage during	search plane departed F strument meteorologica s inch of ice on the win ts to remove the ice acc "bang" at the rear of the scent was initiated and de of 3000 feet the atten r, burned area, and land plane sustained structura g the accident.	airbanks for an in-fligh il conditions, the airpla g leading edge surfaces cumulation. Several mi e airplane, and both en attempts were made to mpts were abandoned a ded the airplane with the al damage to the wings	It icing research ne accumulated s. The pilot cy- nutes later the gines lost power. restart the en- and the pilot se- ne landing gear , fuselage, and

Oct 04	Antonov 12	9Q-CWC	Wimbi Dira Airways	2	D.R. Congo
		The Antonov derying about 100 landed heavy or dercarriage to be portedly two paresult. The fatal the still turning	eparted Kisangani o O Congolese Army s n a dirt strip at Aru be pushed through t assengers were kille lities were reported propellers when ev	on a troop moveme soldiers to Bunia. T , causing the right l he fuselage into the ed and five seriousl ly caused by person vacuating the aircra	nt flight, car- The aircraft hand main un- e cabin. Re- y injured as a ns running into ift.

Oct 06	Cessna 208	C-FEXS	FedEX/ Morningstar	1	Canada
10	- Ada	The Winnipeg controllo over one minute later the direct to Thunder Bay. reported: " eight zero say again," after which point where I need to c "Morningstar eighty size replied that she would a flight. The controller the lights were turned up to two o'clock position at National main railway Avenue and burst into the	er cleared Morningstar flight he flight was identified on ra The airplane apparently enter six zero need an immidiate the pilot reported: "Need an ome back." The controller th kty turn right turn heading 25 not be able to maintain that a een instructed the pilot to turn to the brightest and the control about three miles. The Cessi track about 200 yards east of flames.	8060 for takeoff from runw dar and cleared to climb to 9 red icing conditions, becaus back to the field". The contre immediate back to the field. en gave instructions to return 50 and if you are able mainta lititude. This was the last rad n right to heading 280 for run ller reported that she would ha did not make it and crashe is the intersection of Osborne	ay 36 at 05:36. Just 000 feet and then e at 05:41 the pilot oller replied: "Sixty, . I'm iced-up to the n to Winnipeg: in 2500". The pilot io contact from the nway 31. The runway have the airport at her ed on the Canadian Street and Corydon

Oct 18	Cessna 208	N879FE	FedEX	0	USA		
	The Cessna 208B departed Austin at 22:51. Shortly after departure, at an altitude of about 7000 feet when the engine lost power. The pilot attempted to land the airplane in a vacant field; however, the						



The Cessna 208B departed Austin at 22:51. Shortly after departure, at an altitude of about 7000 feet when the engine lost power. The pilot attempted to land the airplane in a vacant field; however, the right wing collided with a utility pole, and subsequent impact with the ground. The airplane came to rest on its nose, with the top of the airplane leaning against a residential building. There were no reported injuries to anyone in the building.

Oct 19	Antonov 2	?	Naryan-Mar Air Enterprise	0	Russia
The Antonov wa Oma and Nizhn pilot to carry ou wooded area. On rious damage to		vas operating on a finyaya Pesha. En rou aut an emergency lar One passenger was i to the wings and the	light from Nes to N ute the engine failed ading. The plane la njured and the plan underside of the fu	larian-Mar via d, forcing the nded in a ne suffered se- uselage	

Oct 22	Boeing 737-200	5N-BFN	Bellview Airlines	117	Nigeria
		Bellview flight 21 Last radio contact climb to FL250 an The next morning gos. The latest Lagos T DNMM 221550Z TEMPO 0507 500 BECMG 0810 210 TEMPO FEW020	0 took off from Lagos a was about three minute d was to report when re the wreckage was foun AF weather forecast fo 221818 28007KT 9999 0 BR 008G20KT BKN013 CB=	at 20:35 for a domestic es after takeoff. The flig eaching FL130. Id about 30 kms (20 mi or the period of the crass 0 FEW010	flight to Abuja. ght was cleared to les) north of La- sh read:

Oct 22	Trislander	XA-TYU	Aerolamsa	0	Mexico
		Blown upside d tail section wer	lown by hurricane ' e ripped off as a res	Wilma'. The nose c sult.	cone and the

Oct 24	Cessna 208	N1263Y	Bering Air	0	USA
A		Crashed enrout	e, causing substanti	al damage	

I PROCESS

6 PHASES

7 Systems

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Curt Lewis, P.E., CSP Professional Engineer (Herr, # 40094) Certified Safety Professional

Curt Lewis served with a major airline for over 17 years as the Manager of Flight & System Safety. Before obtaining this position, he served as Chief Corporate Pilot, System Safety Engineer, and Safety Director for various industrial corporations.

He has more than 30 years of safety experience as a professional pilot, safety engineer, and air safety investigator with over 10,000 hours of flight experience. Additionally, he has Bachelors degrees in Aeronautical Engineering and Physics and a Masters degree in Aviation Safety.

He is the former Chairman of the Air Transport Association Flight Safety Committee and is currently serving as the US Councilor & US President of the International Society of Air Safety Investigators (ISASI), as well as being a Fellow. He is also an adjunct Assistant Professor with Embry-Riddle Aeronautical University.



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