CONFIDENTIAL HUMAN FACTORS INCIDENT REPORTS.

FEEDBACK

Nº1.

The scheme has now been running for three months and the initial response has been excellent. Crews, management and flight safety organisations have all shown their willingness to assist and promote the programme and we would like to take this opportunity to thank them all. Virtually all major companies are now making forms available in crew rooms and some are carrying them on all aircraft. Even some foreign companies have asked to join in the scheme.

The reports (we've had about 150 to date) range from small slips to near disasters, from 747's to Cessna 150's. In this first "FEEDBACK", we have tried to reflect this range as well as to give you some food for thought. In the following reports we have had to change identifiable material to protect the reporter, but apart from this, the sections which follow in italics are, as nearly as possible, in the reporters' own words. We will publish a more comprehensive review in six-monthly bulletins that will be distributed to Companies in sufficient numbers for all to have access.

Rather than give just a random selection of incidents here we've tried to put together those where the mistakes made were similar, even though they may have had very different results. For example, in DID I DO THAT? all the incidents concern pilots who clearly intended to do one thing, but actually did another. Some of the reports make quite hard reading (for example, the second in SOMETIMES IT'S THE AIRCRAFT THAT TRIPS YOU UP), but we think that they will repay the effort that's required to understand them.

Lastly, a reminder that everything that follows in italics is pretty well in the reporters' own words.

IF YOU DON'T MIND I'LL FLY WITH SOMEONE ELSE NEXT TIME

Two senior Captains flying a medium sized passenger aircraft returning to the UK.

Other Captain's leg, ex-fighter pilot, never forgot it. Also training Captain and always criticising and trying to catch out Co-Capt, always had superior equipment, watch, calculator etc. On arrival I passed him the weather with the comment 'You won't like it'. The weather was poor with strong X-winds. At the marker we were badly placed and too high, I suggested 'Full power for overshoot'. He said, 'Negative', closed throttles, increased flap and continued with the landing. We hit first on port main wheel and wing tip, then I heard the crunch as port engine struck the ground. He called for full power but I held throttles tightly closed knowing that the aircraft was structurally damaged. Further damage occurred before we came to a halt. My mistake was not being more forceful when it was quite obvious that a safe landing was impossible. His subsequent attitude was that if I had obeyed his instructions and given him full power he would have been able to take off again.

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En route to destination from the south, P2 was expecting to be given a landing on R/W 18. However A/F details were given as R/W 36, W/V SW, 10-15 kts. P2 continued to organise his approach with R/W 18 in mind and set up the aircraft to fly downwind...

Captain made one or two comments about being high, dropping gear etc to avoid GPWS. I just thought he was being a bit overcautious. Captain not wanting to interfere with a senior co-pilot's flying, let it go until quite late before taking over and completing a fairly steep approach to land on 36 at which time we realised we had been at complete cross purposes for some time.

Reason for the misunderstanding of the clearance? Language? Poor radio reception? More likely just a case of hearing what was expected and not what was said.

Moral? The most senior co-pilot can cock it up on the nicest day.

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DID I DO THAT?

BAC 1-11: ...in cruise 1st officer selected LP cock instead of adjacent fuel pumps during fuel balancing. No. 1 engine flamed out - instantly relit...

With some slight variations we have had four reports of crews inadvertently flaming out engines on BAC 1-11 aircraft - is this only the tip of an iceberg? We should be pleased to hear from anyone who has more information on this subject.

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BELL HELICOPTER: ...I was carrying a u/s booster pump as an acceptable defect. However, the failure light became annoying so I leaned forward to switch it off, but switched off not the booster pump but the fuel shut-off valve. The engine immediately died. I beeped-up the remaining engine and tried to sort out the problem, at that stage I was not totally convinced that I had caused the failure...

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BAC 1-11: taking off from Templehof temp +35C. T/O weight has been calculated to last kilo as A/C was full and was confirmed by telex. T/O was planned on R/W 09R to give highest possible RTOW. I was flying aircraft. When airborne I called 'undercarriage up', before I could intervene P2 had selected flaps up, he was then apparently mesmerised by the flap position indicator. I shouted to at least lift the undercarriage. I now point at the selector whenever I am handling the aircraft on take-off and ask P2 for undercarrige up.

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BAC 1-11: My first officer was flying the leg. After T/O I carried out the usual checks. Brakes, U/C up, PAX notices off etc. Weather; lovely blue sky. W/V 270/18, Temp +30C! At 1500 feet I noticed the flaps were retracted, I thought John had retracted them early. Usually the flap is retracted at 2000 feet plus in VFR or 3000 noise abatement. Almost immediately he mentioned that the flaps were retracted. 'Oh, I see you have brought the flaps in' he said. 'No' I replied 'I haven't touched them'. He said he hadn't either. Shortly after this he noticed the U/C was still extended. I raised it at 220 knots. There can be no doubt I raised the flaps instead of the U/C after take-off. I had no memory at all of doing this. Why would I do this potentially dangerous thing on an aircraft with which I was completely familiar? I have no idea; no sickness, no stress, nothing dramatic personally.

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BAC 1-11: Dry R/W departing for ..... normal acceleration. I was co-pilot, I called V1 then VR and captain rotated, before wheels had left the ground he pulled full park brake on and destroyed three main tyres (although we did not know it at the time). After inspection by ATC etc, we diverted where uneventful landing was carried out. Later the captain could not explain why he took the action he did. Approx $40,000 of damage was done to the U/C, doors, tyres, stub axles, etc.

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GO ON, HAVE A GO, IT'LL PROBABLY BE OK!

WIDE BODIED AIRCRAFT: Weather - wind calm and fog. Venerable Captain experienced P2 and P3. First approach made flying Cat 1 automatic approach, at DH of 220 ft P2 initiated overshoot. During the overshoot the airfield lights were seen so we went round for another approach still on autopilot. The second approach was an action replay of the first, as was the overshoot.

As we entered the hold to contemplate the situation, another aircraft landed! A suggestion was made that we should fly down 50 ft lower but as this was not legal it was ruled out. We then managed to delude ourselves that flying level at DH 220 ft was a legal and reasonable way to achieve our landing. To do this the autopilot was disengaged for the last approach and the P2 flew a manual approach to 220 ft and levelled off. Within seconds the captain shouted 'I have control' and the aircraft continued to fly level or only gently descended for several more seconds. From my position I studied the information on the flight instruments with a growing feeling of unease. The glideslope was full fly down and had been for some time, we had no way of knowing how far we were beyond the threshold. The brightness of the R/W lights (or whatever) convinced me the captain could see and knew what he was doing. I called out our radio height the same time as the equally concerned P2 called the speed and R.O.D. The next few seconds saw the cockpit filled with height speed and R.O.D.

We touched heavily on the centreline. Heavy braking followed what can only be considered a 'max

performance' stop. We cleared the R/W well down. The pregnant silence which followed served to re-inforce our feelings that we'd been a party to an act of supreme folly and bravado and were lucky to escape with a few grey hairs and a severely battered personal pride.

Later over a beer we discussed our folly - in a quiet corner of course. Why did we make the third approach? We had seen the lights twice - someone else had landed. Possibly the most reckless act of delusion was agreeing that flying level at 220 ft was reasonable. Ninety five per cent of our problems stemmed from our lack of consideration of the ramifications of this deceptively simple solution.

1. By the time the Captain took control the glidepath was full fly down.

2. The aircraft was trimmed (more or less) for level flight not for established R.O.D.

3. Training experience predisposed the Captain to continue on its trimmed flight path, and resist diving at the runway lights.

4. Why didn't someone call overshoot? We were concentrating on giving the man who could "see" all the information we could and for better or worse letting him get on with the job.

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JET TRANSPORT: In the descent to our destination airfield at night the weather being reported good, we requested a visual LH circuit to R/W 29. Whilst attempting to keep the runway in sight, unreported stratus was encountered over the sea. The aircraft was descended to beneath the cloud and the R/W looked for to the left. The GPWS triggered but positive action was not taken because the surface of the sea could be seen clearly and the height looked OK. This caused us to misread our altimeters and mistake 200 feet QFE for 1200 QFE. We were still some way from the airfield and heading for rising ground. Fortunately, we realised our mistake and rapidly climbed to a safe height.

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JET RANGER: I was returning to my home base by myself. The weather was clear on the coast, over land there appeared to be a fair amount of low stratus. On climbing to 2,000 ft or so there appeared to be two layers of stratus with a gap between of 500 ft or so. It was very mystical and beautifully smooth. I pressed on, enjoying the flight hugely and noticed that I was going into a tunnel with the gap decreasing. Suddenly, I was in cloud with little instrument experience and with an artificial horizon that I knew toppled easily. I remember feeling what an idiot, especially with all your experience. I overbanked and toppled the horizon, became somewhat frightened but almost immediately fell out of the cloud into clean air.

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MILITARY HELICOPTER: Low cloud, heavy rain but trying to remain VMC. Important passenger to deliver. During approach to landing site with cloud on tree tops, I elected to continue approach rather than to throw it away. I found it extremely difficult to focus on external references (i.e. objects which I stood a good chance of hitting). I noted that the raindrops on the canopy seemed more important than the nearby trees. Although I consider myself an experienced operator, A2 instructor, VIP pilot etc, I found myself operating in appalling conditions, very close to ill defined hard centred objects with almost a devil may care attitude. I gave into the pressure to fulfil the task. It was pure luck that I turned at the last moment and quite by chance I avoided a large crane.

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LIGHT UTILITY HELICOPTER: Task involved assisting in construction work and transporting a number of underslung loads to a nearby site. During the operation the special hook

and strop became separated from the aircraft and to save a trip to recover it, the engineers offered to use some rope from a support vehicle. I personally did not check the rope but left that to the ground crews and gave them the go-ahead to use it. En route, predictably the rope snapped and the load fell to the ground. Examination of the rope showed it to be of inferior quality.

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COMMUTER TWIN TURBO-PROP: Shortly after landing at an intermediate airport it started to snow. During the twenty minute turn-round there was a complete covering of snow on the ground. An inspection of the aircraft revealed only a very slight and light layer of what I considered to be dry snow on the wings and fuselage. Perhaps mindful of the scheduled time of departure I did not arrange to have the aircraft de-iced as I should have done, with the thought that the airflow would clear the snow on the take-off run.

The ground temperature was +2 degrees centigrade. Take-off normal, trimmed for climb to FL90, entered cloud at 1000 feet which was also the freezing level. Slight build up of ice on leading edge during climb which dispersed on operation of de-icing system. On reaching assigned cruising level I could not lower the nose, both elevator and trim were completely immobilised, no fore and aft movement of the control column or trim was possible. My immediate thought was to reduce power and move the passengers forward for nose down trim. Without thought of breaking strains and after sustained heavy pressure I regained elevator control with a jerk. I concluded that although the snow had blown clear from the clean surfaces this had not been so from the hinges and had subsequently frozen on the elevator linkages. Thank goodness I was carrying a cabin attendant and how important it is to do so.

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VERY TIRING ALL THIS FLYING

SCENE: Helicopter. North Sea, two pilot operation. Longish flight in the morning. Flying into sun. Sea covered in low stratus. Crew well rested. Wearing dark glasses. Winter.

Had a meal en route. Sun bright, co-pilot handling aircraft - I fell asleep - woke up - looked guiltily at co-pilot. He too was in the middle of a long blink. It is possible we were both asleep at the same time for several minutes. There was no deviation from flight path or navigation errors. We were just over three hours into flight.

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AND SOMETIMES YOU JUST FORGET

Flight Engineer reports. Wide bodied aircraft waiting to depart for the US. A start up delay occurrred at the gate after completion of the before starting engines check list. In order not to run booster pumps needlessly during the delay they were switched off and the pilot handling the check list notified. We eventually started engines, completed after starting checks and departed without incident. It was not until we were passing 5000 feet in the climb that I was aware that all the booster pump warning lights were on. The switches, which were off, were immediately switched on, there was no loss of power or fluctuation of fuel pressure or fuel flow and the flight progressed normally to the States. It had been drilled into us that these engines would not perform normally at high thrust and low altitude without booster pump pressure, we could have suffered a multiple flame out or at least a power loss during take-off with catastrophic consequences.

This incident which luckily went unnoticed by the pilots occurred because start up check list was not consulted at the completion of the delay when it was possible that certain pilot and flight engineer items may have been switched off. The fact that all booster pump warning lights

were on as opposed to one or two indicating a failure did not register although it should have done

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WHICH WAY DID YOU SAY WAS UP?

Whilst undergoing advanced training as a cadet pilot I was briefed to fly my night cross country visual navigation exercise to satisfy the CPL requirements. I had flown the same route with my instructor the previous night, under clear skies and everything had gone OK.

The weather was overcast but clear at my destination, and was forecast to be clear later at my base. On the first leg I found the cloud base lower than my safety altitude so I elected to climb to my cruising level IMC and en route the weather - I hoped - would clear. After some ten minutes of IF I decided to abandon the exercise and return to base as I was becoming nervous about continuing in IMC at night. This was the first time I had been in this position. I set about rotating the OBS selector to a reciprocal heading and told ATC I was returning. I was about 3000 feet in the turn and spent a little time re-setting the OBS and neglected my primary instrument scan. For some reason I glanced up and through a small window in the roof and I saw a row of sodium street lights coming up at me. I could not recognise the presentation from the artificial horizon it was too unusual. I recovered visually the best I could (I was now beneath the cloud) and returned to base - I told no one. Later that night I remember going into mild shock when I realised what a few more seconds would have entailed. I find it remarkable that to this day my first warning was visual (seeing the street lights) my sense organs had not detected any unusual manoeuvres at all. One is told at lectures how totally unreliable your inner ear can be but I never realised just how much until that night.

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SOMETIMES IT'S THE AIRCRAFT THAT TRIPS YOU UP

CAA regulations state that when doing a reduced EPR take-off the go round EPR shall be bugged in case of engine failure. This in spite of the fact that all performance parameters are met with a reduced EPR take-off and it is not necessary that any further power need be applied should an engine fail - though it may be a good thing to do so. This means that there is no bug to set the take off EPR and it has to be done by reading the gauges. During this take-off I set the incorrect and too low EPR. At 80 kts I realised that the acceleration was slow but could not account for it until 100 kts when I applied full EPR (for which there is no bug it being at go round EPR) and took off using a lot more runway than we need have done. If I had not noticed the slow acceleration I hate to think where the aircraft would have got airborne - if at all.

I suggest that all reduced EPR take-offs are bugged at the reduced EPR (the figure the engines will actually be at rather than the go round EPR which I have never known to be used on any take-off other than a simulator detail).

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747 take-off configuration warning signal..... Stabiliser trim 'green band' selection was incorrect for following reasons. On Boeing 200 series 747 aircraft, Stab. trim has to be set in green band or T.O.C.W. signal will sound on throttle opening. Green band is set by selector switch according to C of G trim units given on aircraft load trim sheet. There are three positions: nose down (1.8-7.5 units), mid (4.0-7.5 units), nose up (4.0-10.0 units). In my airline <u>all</u> trim units are called 'nose up' units regardless of the fact that there are <u>no</u> 'nose down' units which are ever used on trim sheets.

On this flight the load sheet figures read out as '3.5 nose up' and green band select switch was put to nose up, 3.5 units should of course have been a nose down selection.

Solution:- stop referring to trim units as nose-up, use plain units as does the flight manual.

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PERSONAL PROBLEMS

For at least two to three years prior to the incident, there had been a steady deterioration in the state of my marriage to the extent that I would get up in the morning unnecessarily early to get out of the house before my wife and child woke up. On this particular morning this did not occur and I was subjected to a non-violent but angry argument which left me emotionally boiling, a state I remained in throughout my drive to the airport, through flight planning and indeed up to the incident itself.

There was a vehicle in the undershoot, of which I'd been warned. Radar vectors were given to me to feed in between two other faster aircraft and I was requested to carry out a short landing and try to clear by an early taxiway. Just before touchdown there was a solid bump as I clipped the vehicle. A few days later landing on the same runway with the same van in the same place it could not have appeared more clear to me, but on the day in question it completely failed to register. What was even more alarming to me was that never before in my flying career had I made such a misjudgement.

I realised afterwards that the total loss of concentration was caused by the fact that my mind was entirely filled with the continuing emotional conflict of the argument with my wife. Later we separated and as soon as the separation took place I could almost feel the mental tension and build up draining away from me and I felt marvellous about my flying again.

It was only when the cause of the conflict was removed did I realise what a strain I had been under and how it made me entirely oblivious as to what was going on. If anyone had suggested that I needed help I should have said it was completely unnecessary.

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A NOTE ON ROSTERING

We've had a number of reports from a wide spectrum of pilots who feel strongly that their rostering system can be responsible for pilots officially retaining their recency but actually being out of real flying practice. If you think that the way your work is scheduled has real flight safety implications, and you want to say something about it to us that you don't feel you can say to the CAA or your Company do let us know - especially if you've had an incident for which you think your rostering system is to blame.

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POSTSCRIPT

We hope that you've found that these reports have made interesting and provocative reading. We have tried not to pontificate in this FEEDBACK as we're sure that you're just as capable of drawing the moral from each of the above reports as are we. This doesn't mean that we've done nothing though. In all the incidents where a switch, gauge or procedure was involved we've drawn it to the attention of the operators and/or the CAA Flight Ops Inspectorate. However, we feel that the value in many of the reports (like the one from the pilot with the personal problem) is to enable you to share the experience. Also, problems of crew co-ordination and "action not as planned" (where someone intends to do one thing but does another) are not well understood, so if you have any similar experiences or even ideas on these topics, PLEASE SEND IN A REPORT; it's easy and it's free.

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NAME.....

ADDRESS.....

.....

.....

PHONE No.....

BACKGROUND TO THE INCIDENT

BRIEF PERSONAL DETAILS		
CREW POSITION	TOTAL FLYING HOURS	HOURS ON TYPE

DETAILS OF INCIDENT : PLEASE COMPLETE THOSE BOXES WHICH ARE RELEVANT			
DATE	TIME GMT/LOCAL	AIRCRAFT TYPE	No OF CREW
FLIGHT : FROM TO	IFR/VFR	LOCATION OF INCIDENT	PHASE OF FLIGHT
TYPE OF OPERATIONS		WEATHER CONDITIONS IMC/VMC	

PLEASE WRITE YOUR ACCOUNT OF THE INCIDENT IN THE SPACE PROVIDED BELOW