

FEEDBACK

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Editorial

Reporting of Errors. At the recent CAA sponsored 12th Symposium on Human Factors in Aviation Maintenance Mr David Marx, Aviation Safety Consultant referenced a briefing on human error management in the US medical industry by Dr Leape, a professor at the Harvard School of Public Health, to a US Congressional sub-committee in October 1996. Dr Leape stated that only 2-3% of major hospital errors were reported through hospital incident reporting systems and the single greatest impediment to error prevention was that people were punished for making mistakes. Dr Leape further stated that high reliability industries such as aviation, air traffic control and nuclear power learned long ago the fallacy in this approach to perfection.

The UK air transport industry can claim rightly a number of mutually supporting processes for the open and non-punitive reporting of safety related incidents that, in conjunction with an acclaimed standard of accident investigation, have eliminated many technical causes of accidents. However, human error causes have been more resilient and remain a major cause for concern, in spite of the availability of one of the most comprehensive incident reporting systems including the independent, confidential reporting process provided by CHIRP.

In particular, the capture of human error data that does not lead to an accident/reportable incident remains elusive, because there is a natural tendency to forget about such errors, or to consider them to be of insufficient importance to be reported. However, it is precisely this type of information that will assist in identifying some of the key errors that will feature in future accidents.

As a specific example, there were 248 reported level busts in the UK FIR last year. How many more went unreported, and how many unreported minor altitude deviations occurred, that in similar circumstances could have resulted in a level bust? If you remember that a level bust, even a minor one, may be a potential cause for a mid-air collision, the importance of sharing this information becomes obvious. This issue contains two reports on this subject (Pages 5/6). CAA (SRG) has sponsored the formation of the Level Busts Working Group with the aim of reducing the number of incidents. One of the initiatives of the Working Group is to mount an awareness campaign to collect and analyse as much data, as may be available. More information on this particular initiative will be available in the next few months.

So don't forget about your experience, or merely chat about it in the pub after work, or the hotel during a stop-over. Report the incident through the most appropriate system, so that others may learn from your mistake.

Working Time Directive. FEEDBACK Issue 44 (October 1997) contained details of the Working Time Directive that the UK Government planned to adopt as part of the Social Chapter and highlighted that the Council of the European Union had decided to extend the Directive to include non-mobile workers in the Air Transport sector. We have since been advised by the Department of the Environment, Transport and the Regions that the Directive, 93/10/EC, is to be adopted by the U.K. Government for application in the U.K. To this end, legislation will be laid before Parliament with a view to it becoming law later this year. However, the Directive will be adopted as it stands, i.e. with the exclusions to its provisions for the 'non-mobile' workers in the Air Transport Sector, amongst others. This means that further legislation will be necessary, through the Council of the European Union and ratified by the U.K. Government, to vary the exclusions. This process is likely to take several years, during which time the existing working hour agreements and arrangements individual companies have in place will continue to apply.

Peter Tait

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CHANGE OF ADDRESS?

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A Reminder on the Magazine Format:

The following fonts are used:

- Disidentified reports. These are reproduced with minimum text changes
- *CHIRP Comments are italicised*
- Verbatim Third Party responses are printed in SWISS type

FEEDBACK - COMMENTS

Holding Procedures (FB45)

In "Holding Procedures" (*Page 5*), an ATCO reported seeing incorrect holding pattern entries by EFIS aircraft, and indeed given the frequent short notice of an impending hold at destination this is not surprising. It might help the controllers, if they knew how FMC hold patterns were presented in aircraft, such as the B747-400, B757/767 and the B737-300.

Most software will present the Hold Page with a standard right-hand pattern that is aligned with the aircraft's current inbound track to the facility, unless the approach has been pre-programmed with the correct (*track and direction for the*) hold on the Route Page. This can be done, but is customer commanded, and is generally accomplished only when there is a high probability of a hold.

Therefore, if the crew are told of a hold only a few miles short of the beacon, and this happened to me recently at a UK airport, it takes time for the crew to display the Hold Page; line select the Inbound QDM, select the direction of hold if a left hand (not the default right hand) pattern; select the leg time if needed; put all this into the En-Route Legs page, and then execute the pattern in time for the aircraft to enter the amended hold.

With less than 10 nm to go, and reducing speed and height at the same time, you can appreciate that errors can occur in this situation. Of course, they should not do so, but we are all far from perfect, so please, ATCOs, give us as much notice as you can when a hold is likely. It is easier to delete a hold once constructed, than try to build one in a hurry. However, if as was suggested (*FEEDBACK 45*), a hold is

entered as standard along all routes, this can distort the time/ETA/fuel calculations to the destination, so may not always be appropriate, which perhaps is why many of us don't do this.

Thanks for your excellent publication.

Holding Procedures (FB45)

In my experience, the direction of the turn programmed into the FMC (*Flight Management Computer*) is so often wrong that I take it for granted that it will be and so I have the information on hand and ready.

If the requirement to hold is sprung at the last moment, it's best to use HEADING SELECT while the PNF (*Pilot Not Flying*) straightens it out with the FMC.

Having said that, it would be nice if the people who accept money from our various companies would write the programmes correctly. I assume they have the information available in their offices.

One is tempted to think that as long as the pilot/ATCO team take full responsibility for any problems, there will be insufficient incentive for #### (*Avionics/Software Manufacturers*) to take more care.

However co-operative ATCOs are in advising crews as early as possible of a requirement to hold, there will be occasions when an instruction to hold will be given at short notice. These occasions are also likely to be those when other traffic demands on the controllers are significant.

In such cases, it is important that the entry procedure has been briefed and any limitations of the Flight Management System are recognised to ensure a correct entry.

Monitored, but Forgotten (FB45)

In "Monitored, but Forgotten" (*Page 13*) high workload and an ill-timed change from Approach to Tower frequency led to a landing without clearance, an event which must have occurred to many of us, often without any further action.

May I suggest a possible remedy which is used in my previous company, where the final item on the Landing Checklist is "Landing Clearance.....Obtained". Until this challenge and response item is complete then the aircraft is clearly not cleared to land! A similar challenge and response is the last item in the Before Take-off Check list: "Take-off Clearance.....Obtained".

Which QNH? (FB45)

Reference FEEDBACK 45 Page 4. I would respectfully point out that the Standard Pressure Setting of 1013.2 mb/hPa is not QNE.

QNE is Q-code for:

- a. The interrogative "what indication will my altimeter give on landing at (place) at (hours), my sub-scale being set to 1013.2 hPa?
- b. The answer "on landing at (place) at (hours) with your sub-scale being set to 1013.2 hPa your altimeter will indicate (figures and units)".

ICAO Doc 8400, ICAO Abbreviations and Codes refers.

I have no wish to be pedantic, but I think correct usage is important to maintain accuracy in what is a technical discussion.

Commercial Pressure (FB45)

I refer to FEEDBACK 45 and the subject of Commercial pressure.

On one occasion I was despatching a ### (wide-bodied) aircraft belonging to a contracted third party operator. The Station Manager for the airline, as usual, was applying pressure for an on-time departure. On this particular occasion I did not re-check the fuel load figures until after the aircraft had departed, only to find that the up-lift was short by 5,000lbs. I now insist on re-checking my figures before signing-off the fuel log.

I understand that the airline has a salary bonus scheme, in which the Station Manager's performance is based largely on the Station punctuality record.

Commercial pressures exist in many forms and cannot be eliminated from commercial air transport operations. In this environment most individuals perform well when working under reasonable time pressures and thus contribute to the corporate aim of a good, punctual operation, which keeps everyone happy. However, experienced Engineers and line managers should also know when not to cut corners to achieve a specific objective, no matter from where the pressure comes.

Procedural Awareness (FB45)

The two reports "Procedural Awareness (1) and (2)" highlighted an apparent difference in attitude about "Control" in the "FIR" between the two sides of ATC. I would hope that clearances given by Area Control are not unsafe, although the writers seem to think that they are!

It is relevant to note that the joining clearance is only applicable at the edge of Controlled Airspace and what goes on outside it is generally of no interest to the individual giving the clearance - the ATSU receiving the clearance then has the problem of resolving any confliction between any outbound and inbound aircraft, but surely that is what he/she is there for?

It may be deemed inappropriate for an outbound to be given a joining clearance at the same level as one that has left controlled airspace from the Aerodrome point of view, but it is perfectly safe from the Area aspect. I cannot understand any logic that says that a joining clearance cannot be given that is the same level as one used for the arrival airport inbound traffic, once the latter has vacated the airway.

On the other hand, any Approach ATCO operating outside CAS, who assigns one aircraft a level that is known to be occupied by another in a procedural environment, just because it is the clearance level to join an Airway/TMA, may well wish to consider the wisdom of his/her action.

However, the writers may well have a point that Area Controllers are disregarding co-ordination and/or are too narrow in their outlook, but I do not believe this to be relevant in report (2).

Perhaps I am one of those whose attitude is similar to the quoted occurrences, but whilst I see the problem, I cannot agree that the clearances were either unsafe or procedurally incorrect. Appreciation of other people's problems is a different matter.

Recognition and appreciation of the other agency's task would appear to offer an effective solution to this problem.

ATC REPORTS

Am I Here ... or There?

A twin engine turboprop was on final approach on a non-precision instrument procedure to Runway ## and had been cleared to land. The weather conditions were poor with patchy fog.

I first saw the aircraft at less than one nm final from the threshold of Runway ##, and it appeared that the aircraft was configured for a "go around" due to the fog. Suddenly, the aircraft made a series of very tight left and right turns to position itself onto final approach for Runway ##, and subsequently touched down approximately two thirds of the way down the runway.

Previously during that morning, other aircraft had made instrument approaches to Runway ## using the same procedure, and although unable to land on Runway ##, had been able to maintain ground contact and make visual approaches to the reciprocal runway. This had obviously entailed several rapid changes of the runway lighting from one end to the other.

It was only after the aircraft had landed on Runway ## that I noted that the approach lights and PAPIS were still selected for the reciprocal runway!

It has become increasingly common within our company for ATCOs to hold two validations at different airfields, quite often one a busy unit and the other a quiet unit. This policy would appear to have been permitted, to enable my company to continue to provide full ATCO cover in spite of staff shortages. I am concerned about this policy because, although I wasn't consciously aware of it at the time, I believe that holding two

current validations at different units, that could not be considered to be complementary, may have contributed to my error. Although CAA (SRG) verbally disapprove of dual validations, I believe that they should be less tolerant of permitting dual validations in such circumstances and regulate this matter more closely.

Advice on this matter was sought from CAA (SRG) Head of ATS Standards. In their response the Authority stated:..... the possibility of confusion when an ATCO holds certificates of competence at more than one unit has been recognised for some time now and has been the subject of discussion between #### and ATS Standards Department. As a result of those discussions the number of dual certified controllers is being reduced.

FLIGHT DECK REPORTS

Level Bust - A Simple Error?

Recently, for the first time in over 20 years of flying, I was responsible for an altitude "bust".

Descending into FFF (*UK destination*), autopilot engaged, we were cleared to Flight Level 70. Air Traffic Control asked us to call the handling agents. The First Officer made the call. The aircraft descended through our cleared level to Flight Level 65 before I "woke up" and levelled off. ATC noticed our transgression just after we did, and after a suitable comment descended us to FL 60. Luckily separation standards had not been compromised.

An observer might view this incident as a simple error, or an example of crew incompetence. As the Captain and Handling pilot I would find difficulty in disagreeing with either verdict. However, after reflecting on the incident, some of the following factors in the period leading up to the incident may have been relevant.

On the previous day I had commenced duty at 12:00 travelled AAA-BBB to operate four sectors BBB-CCC-BBB-CCC-AAA finishing duty at 01:05 Total duty 13 hours 05 mins. (Discretion was used to complete the last sector).

Minimum rest period 13 hours 05 mins, therefore I could come back on duty at 14: 10.

The next day (day of the incident) I was just about to leave home when I received a call from Operations "We've got a flight for you, I know your report time is 14:10, We've scheduled your departure at 1500 to operate AAA-DDD-EEE-DDD-???"

The reduced report period prior to scheduled departure was no problem since the aircraft was still unserviceable when we reported for duty. Engineering had agreed to contact Operations when the aircraft was serviceable, but the departure had been scheduled anyway. (I remain to be convinced that aircraft engineering is best carried out under the pressure of time).

The aircraft became serviceable at 15:20 and at 15:30 we were about to depart for DDD when we received the following message:

"Change of plan. You are now operating AAA-FFF-GGG-FFF-AAA."

I confirmed that this was possible, but pointed out that the fuel on board may restrict the payload out of FFF.

At 15:40 we departed for FFF and the flight progressed much as usual. During the descent into FFF, the altitude "bust" occurred. The R/T call to the handling agents was to advise them of the fuel remaining/payload available for the next sector.

Back to the reasons for the "Bust":

Non adherence to SOP's and breakdown of crew co-ordination and monitoring caused by the distraction of Company R/T call? I believe the "Alt Arm" had been armed when we were re-cleared to FL70, but I may have incorrectly cancelled it by using the pitch controller during the flare - this is only supposition on my part. I don't know what I was thinking about at the time, obviously not the job in hand! I believe the distraction of the question of payload may have been a factor.

Many companies operate under some degree of commercial pressure. This is particularly the case when attempting to deal with unplanned schedule delays and changes. In such circumstances, it is inevitable that some of this pressure may

be transferred to crews and engineers. However, it is often the case that individuals place themselves under pressure in seeking to achieve the perceived corporate objective. Many incidents/accidents result from not one single cause, but a number of related errors and decisions that, although not significant in isolation, may combine to defeat the normal safety processes.

No matter how good the processes and procedures, errors will be made. Consequently it is important that the various operational pressures and frustrations do not lead to procedural short cuts and omissions.

Level Bust - A Question of Pressure Difference

Flying with an inexperienced First Officer who was handling pilot we departed ##### on the SID. The day had a significantly low barometric pressure. We levelled at 6,000ft. and were cleared to climb to FL70, which I acknowledged. Whilst I was speaking, the First Officer selected 070 in the altitude pre-select and initiated the climb - as SOP in our company. As soon as I finished with the radio, I cross-checked his ALT Pre-Select setting and advised him - "Checked" and then told him to ease the rate of climb as FL70 was only just above 6000ft. We then did the setting of the 1013.2mb on the altimeters again in accordance with our SOP. The indicated altimeter reading was already FL71 and by the time the First Officer reached zero rate of climb we were 300ft above FL70.

Our company has since changed the SOP to permit the setting of 1013.2mb prior to reaching transition if cleared to a flight level. However, this doesn't help much in this particular case. A bit of experience and alertness probably reduced the size of this altitude bust to a "safe" level.

The reason why I write is to draw ATCO's attention to this situation of clearing aircraft to the next available FL above transition on days with very low barometric pressure. On this day we estimated that there was only 540ft between 6000ft and FL70. Combined with the low experience level in the turboprop world and some relatively good

climbing aircraft (SF340/Dash 8/ATR42 etc) this kind of clearance to climb is almost a guaranteed altitude bust, especially if the aircraft is being flown manually.

Perhaps the use of the phrase "adjust your level to FL70" rather than "climb to FL70" may have highlighted to the F/O that a very gentle climb was all that was required.

Tiredness, Complacency

I am writing to describe an incident that highlights tiredness, complacency and possibly a minor procedural deficiency.

I was the Captain inbound to LHR at the end of a long-haul night flight.

The First Officer was the handling pilot, and did a very good brief prior to TOD (*top of descent*), for our STAR (*Standard Arrival*) and ILS to Rwy 27R, with holding at ###. The First Officer and Flight Engineer were very competent operators and the atmosphere on the flight-deck was good.

On leaving ### (no hold required in the end) under radar, I was asked by the First Officer to set up the aids for the ILS. I selected the page for Rwy 27L by mistake and proceeded to set up the frequencies and course-bars accordingly.

Because the weather was good, we were all very familiar with LHR, and I advised both the other crew members that the code ILL was checked on both with the inbound course selected, I probably exuded an air of confidence, such that I lulled the other two into a false sense of security that all was well, which unfortunately meant that in the heat of the moment, with checklists being completed, and attention being diverted to other tasks such as flight path and R/T monitoring, no one picked up my error.

With the NDB having been moved to an airfield position from an outer marker position, there is virtually no awareness of flying through the localiser, so the first time that our attention was brought to our error was when the controller gave us a radar steer to intercept the localiser from the south.

The correct ILS was selected and identified. The approach and landing was completed without further incident.

On completion of our post-flight duties the three of us analysed our performance and decided that the good weather and familiarity with LHR led to a slight complacency, which, coupled with tiredness, provided the fertile ground for an error.

We also felt that there is a tendency for crews to short-circuit SOP's in the briefing, by not mentioning the ILS frequency and code, which in this case may have alerted one or both of the other crewmembers to my error.

We all came out of this incident with egg on our faces. Had we made the same error at an airport that does not enjoy the same outstanding standards as LHR, the incident might have had more serious consequences.

Silly but Tired?

The flight was the last (*fourth*) sector of a back-to-back schedule between the UK and the USA and as a crew we were getting on very well. The Captain was flying the approach. When he called for Flap to be lowered to ##deg, I did as I always do - call back "Speed checked, Flap ##" and wait a short moment so that the engineer can check as well. I then moved the flap lever in the wrong direction!

Fortunately, on this type the actual flap movement is very slow and before it had moved too far both the engineer and myself had noticed and I quickly selected Flap ##. I consider myself lucky to have an engineer looking over my shoulder watching my "silly" but potentially dangerous mistakes. I put this error and the many other "small" errors I have witnessed, and made myself, down to fatigue. Not the fatigue that is extreme and has symptoms such as insomnia and weight loss but the insipid (*sic*) fatigue that continuous trips between UK and the US cause.

The company has recently employed a number of new pilots and the ones who have just joined this fleet are all experienced pilots. Their pay is dependent on the number of trips flown

each month and this appears to have had the effect of lowering the sickness rate. This in turn has pleased the management as the "fatigue problem" has gone!

Directed or Assumed?

We were approaching 'LAM' on a radar heading of 270deg and were given a frequency change. The next controller told us to turn left onto a heading of 260deg. After a while he said "Resume own navigation to Lambourne and report your inbound heading'. The new heading happened to be 270deg he said 'Roger'. A couple of minutes later he said "Own navigation again to Lambourne and call Heathrow Director on ###.##".

This is only the latest instance of a latent quirk which surfaces from time to time, i.e. that by asking what someone's heading is, the controller then assumes that the pilot understands he is now to maintain that heading as a Radar Heading.

I find this unsettling. I think controllers should say what they want, rather than leaving a pilot wondering whether to infer an implied instruction.

Frequency Frustration

Over the last year or so, I have found myself becoming increasingly frustrated by the inability to pre-select the initial radar frequency required after take-off.

This problem stems simply from not knowing what the frequency will be until the Tower Controller tells me to change to ###.##.

You might say, "What is wrong with that?" It is the normal procedure and occurs throughout the whole flight. True. But there is only one critical, busy, "all things happening at once" stage of flight and that is during the two minutes or so after take-off - gear up, flaps up, anti-icing on, heading changes in accordance with the SID etc. In addition to these tasks, I often find myself having to dial up the Departure Radar frequency prior to changing frequency. Firstly, this is a very bad time to mis-dial (which sometimes happens) and so be unable to talk to

Radar. Secondly, the Tower Controller already knows the frequency before I am cleared to take-off, so I could have a chance to pre-dial it, in the "calm before the storm".

I know some airports publish the expected radar frequency on the SID page (very helpful, but not always the frequency in use). However, most don't.

I have developed the habit now of always calling the Tower Controller prior to line-up to confirm the Radar frequency if I'm in any doubt. It would be VERY helpful to us pilots if ATCOs would ALWAYS advise the radar frequency prior to take-off if it is not published, or if different from that published. At some major UK airports, Tower Controllers sometimes provide this information, but not always.

It is too easy to misdial just after take-off when we are so busy, and it's an unnecessary complication of the task.

Is there any chance of having a standard agreement on this?

The Right Training?

During two instrument approaches with an ab-initio co-pilot, who had just been released to line flying as handling pilot, I had to take control. Before doing so I had been acting as a talking instrument panel to do all I could to help him stay within acceptable parameters.

It would be too easy for me to write a report on him and walk away, but with more than 10 years on type, I see this as a repeated problem when new pilots arrive on the fleet. I know that the learning curve is so steep and so long that it can be months before new co-pilots are not working on the brink of overload all the time. To expect a trainee to go from flying say an R22 on sunny days in South England to operating IFR in the hostile environment of the North Sea is expecting too much for the average pilot of limited experience. A helicopter is unstable and the autopilot fitted has poor authority, the co-pilot only has an air speed and altitude hold that are of little use on an ILS. It is a very demanding task for an experienced helicopter pilot to fly an uncoupled ILS in moderate to severe turbulence on this type.

Soon the problem is going to get worse as all new pilots will have to be instrument rated and not just pass a company base check. This will only make the learning process longer before the trainee can have a stable period to consolidate his limited experience.

In the meantime I hope that this individual will come good before his personal overload threshold overloads his Captain with potentially serious consequences.

Too Much Respect?

In several accident/incident investigations the "Flight Deck Gradient", a term used to describe the reluctance of a less experienced crew member to question a decision/action of a Captain, has been cited as a contributory cause.

Recognition of this potentially hazardous effect is often included as an aspect of CRM training, but the problem can be extremely complex, particularly if combined with an apparent short-term incapacitation. In such circumstances, it is often difficult for the junior crew member to intercede.

It was the Captain's leg. He is an experienced pilot, capable and well liked and in no way overbearing.

On short finals to Rwy 30 at ####, after a good, stabilised visual circuit and approach, the aircraft begins to descend below the VASI indications, giving finally four reds. As the runway has a displaced threshold and the obstacle was now behind us I make no comment, as I presume the descent (*below the correct glide-path*) is intentional to facilitate an early touch-down point. (The runway is relatively short for our type of aircraft).

The Captain now sees the VASI indications, says so, and applies power. I call "Rad Alt 50", "30" and "20" but we don't land. I inform the Captain we are floating and to put the aircraft on the ground. He seems surprised by my call, but removed power and lands. However, we are between 1/3 to 1/2 of the way down the runway. The Captain appears transfixed by the runway and hasn't engaged reversers as per SOP. I call for reversers and query the autobrake setting

of level three out of five available levels. He makes no response although he is not obviously unwell. I state that I am increasing autobrake to level four. He doesn't acknowledge. As speed reduces he finally deploys the reversers, but as our Normal Operations SOP, only at idle thrust. We stop with approximately 200ft runway remaining. On taxi back he states he had difficulty reading the VASI and no other discussion occurs.

With hindsight I allowed my attitude of respect and friendliness toward the Captain to influence my actions. I was insufficiently assertive once the incident was in progress and prior to the incident I presumed rather than checked the reasons for his flight profile.

ENGINEERING REPORTS

A Serious Omission?

I am employed by a third party maintenance organisation. I was working as an engineer (non-certifying) on a major check and had been given a task in the left wing inboard rear spar area, when I noticed that a section of the trailing edge flap drive shaft was abraded through the protective finish down to bare metal. Adjacent to this abraded section was a cable loom that had been contacting the drive shaft, rotation of the drive shaft had chafed through the protective covering of the loom so that individual cables were visible. The cables supplied power to various services in the left wing. I drew the attention of my supervisor to the defective loom, but as there was a rush to complete system's functional checks before the aircraft was repainted, I was not aware that any action was taken to rectify the defect before the aircraft left the facility.

In view of the potential seriousness of the contents of this report, the matter was immediately brought to the attention of a senior manager of the organisation concerned. To their credit the Company concerned took immediate action to investigate the matter by reviewing the documentation and arranging a detailed inspection of the aircraft.

No evidence of the reported problem could be found, which would provide some

assurance to the reporter that action had been taken to rectify the defect. The reported defect was noted for the next major inspection.

The reporter expressed a genuine concern. However, we received this information some time after the aircraft had been on check, which added to the difficulties of resolving the issue.

It is most important that matters such as this are reported promptly direct to the Company, or to the CAA (this was a mandatory reporting issue). If, for some reason a reporter feels unable to report directly, submit a CHIRP report as soon as possible.

Third-party Certification

One of my duties is to monitor third-party engineering agencies and it has become increasingly clear to me that the agencies I monitor are on many occasions undermanned.

The length of time that a person is at work and carrying full certification has direct safety implications.

However, I know of Certifying Engineers that have been allowed to work nine and 10-hour shifts on 46 consecutive days and more. On one occasion a certifying engineer working an aircraft whom had been on duty for an extended number of days, became incapacitated while actually working on the aircraft. It was fortunate he was not involved in an engine run at the time. Very little has been done to reduce the likelihood of this happening again.

In the area that I monitor it has become the norm rather than the exception (for engineers) to work extended continuous shifts and, needless to say, it worries me. I know of one Certifying Engineer who earned well in excess of half his annual salary in overtime payments (at a flat rate) in a six-month period.

I can do no more than report my concerns within my reporting system, but no one has responded or seems unduly worried. In fact I have been told that it is not my, or their concern. In the end it all comes down to cost, with safety taking a back seat, where, in fact, they should both be working together.

Rather than try to factor this element into an accident would it not be best to be proactive rather than reactive and in the name of safety make it illegal to work this way.

I came very close to going to the CAA, but I value my job. (I need my job!). I even have reservations on airing my concerns to CHIRP, but in defence of Air Safety I have to take that chance.

I don't know what I expect you to do, or even if there is anything you can do.

This case highlights the failure of both the organisation and the individual to recognise their respective responsibilities in relation to fitness to work. The employer has a legal 'Duty of Care' to the employee, and the employee has a responsibility to be fit for work throughout a period of duty (AWN 47 Para. 3.2).

The extended period, over which the engineer was permitted to work continuous shift patterns, involving late night/early morning shifts, would cause an individual to suffer from acute and then cumulative sleep loss. The probable level of sleep disturbance, leaving aside the obvious safety implications, would mean the person involved would be ineffective at work - a key point that managers should note. It is relevant to note that this type of work pattern was identified as a principal causal factor in the errors that led to the Clapham rail signalling accident.

Turning to the individual's responsibility, it is often the case that a person's judgement, with regard to his fitness to work such patterns, can be blurred by the personal financial reward. Not only is this irresponsible but regrettably, it can be a potentially 'deadly' sin.

In regard to the reporter's concern regarding identification, our policy is to ensure the absolute confidentiality of all reporters' identities. After a report is disidentified, no information is released to third parties without the prior approval of the reporter.

Important information is brought to the attention of the relevant management agency at an appropriate management level and this has been done in this case.

Finally, it is apparent that there is an increasing willingness on the part of many organisations to examine and to address

some of these long-standing safety-related issues that Engineers, and others, have been reluctant to report in the past.

Hand-over Procedures (1)

During shift hand-over I was informed that I would be required to carry out landing gear functional checks, but a pipe had been removed, due to splitting. The pipe was identified as being in a part of the system that could be by-passed, not associated with the main gear.

The aircraft was behind schedule and the instruction was for the gear 'swings' to be done, notwithstanding the missing pipe.

Preparation took a long time as the areas under the wings and fuselage were congested and the aircraft at the time was in the wrong configuration for jacking.

With the aircraft duly prepared and jacked, I had inspected all the gears and bays to ensure that everything was in order (apart from the missing pipe).

I was in intercom contact with my technicians who were positioned around the bays. I started the external hydraulic systems and when satisfied that all indications were correct and operating correctly I selected undercarriage up.

All gears (bar the nose gear that was locked out) retracted correctly. About one minute later one of the landing gear doors started extending and retracting of it's own accord; fluid was also visible around the bay. I stopped the functional check and went to investigate the problem.

I lowered the undercarriage to take the weight off the gear and then a loud bang was heard. The gear with the door problem appeared to 'tap dance'.

Further investigation revealed that a pressure-regulating valve had ruptured and that the missing pipe was, in fact, the return line for a main gear actuator and pressure-regulating valve, not the one reported. The ruptured line was also connected by a 'T' piece to the door sequence valve.

The result of all this could have been serious injury, but, thankfully this was not the case. The experience I have gained from this is:

Not to take the hand-over at face value.

Not to allow myself, or my team, to be pressured to cut corners because of concerns at an aircraft already behind schedule.

The company was advised of the problems associated with hand-overs and acknowledged that better training in providing a clear, unambiguous, hand-over was required for all staff involved in the process. Steps have been taken to provide this.

This incident is another lesson in thinking twice before putting yourself under undue time pressure; the effect of the incident was to cause even more delay to the aircraft. How often does that happen?

(2)

I am a Licensed Engineer, working in a Base unit. At 17.30 hours, we were contacted by the Line unit to assist with an inspection on an aircraft. The aircraft had been parked in one of the Base hangars all day but had been unavailable for the inspection as it was being used for other purposes.

At 17.45 hours, on arrival at the hangar, I was met by the Licensed Aircraft Engineer (LAE) who was working the aircraft. I established that I was being expected to take a hand-over, certify the partially completed, undocumented inspection, and then hand-over again to the oncoming night shift at 18.45 hours. I was to go off shift at 19.00 hours.

I stated that this was not an acceptable situation, as I had not been involved with the aircraft up until this point.

I contacted the Line shift manager and informed him of the situation and he advised me that I was putting that night's service in jeopardy. He wanted someone to "stick with it" until the new shift came on, and insisted that I take it on.

I refused, as I could not see that I would be able to take a satisfactory hand-over and then be able to hand it over again in 45 minutes. Also having not been involved, I would be unable to answer any questions the on-coming shift may have. I was not prepared to certify the undocumented previous work, as I could

not establish if it had been carried out in accordance with the maintenance manual. It also came to light that the inspection had already been handed over from a LAE who had gone off shift earlier that afternoon.

It was unclear as to why we were not contacted at the outset, as it was clear that the Line unit could not give continuity to this job. Also, why, with an important unscheduled inspection required, was the aircraft used for other purposes?

Hand-overs have been identified by this organisation as a key area to improve as a result of a survey into incidents such as this. The company is targeting hand-overs in training as one aspect of 'Best Practice'.

This is also another example of where, with a little bit of pre-planning, some of the problems could have been mitigated. Someone gave permission to use this aircraft for other purposes, could this have been achieved in another way? Recognising the Line workload earlier and handing the task to Base from the start (as our reporter suggested) would have helped the situation. It is more than likely that there were engineering inputs in all of these decisions. Experienced Engineers, whether at the Base, on the Line, or in Planning should monitor the operational situation, detect the signs and act accordingly.

Airworthiness Notice No. 3 Para.1.4 covers the responsibilities of Certifying Engineers in both these incidents. Qualified managers with supervisory responsibilities for such maintenance work should also be mindful of these provisions, especially when they are not certifying.

There are some situations in which managers of Certifying Engineers are not currently qualified, but nevertheless are in a position to apply pressure to the certifying individual. It should be made clear, by both the Authority and employers, that the provisions of AWN No. 3 apply equally to such managers.

Technical Logs - Open Items (1)

A twin-jet was due to night-stop on completion of the schedule and Captain 'A' had reported a vibration problem on

the left-hand engine to *(Maintenance Control)*. He also made an entry in the Tech Log stating the defect. Due to a shortage of aircraft the subject aircraft was then re-allocated for another sector.

Captain 'B' not only accepted the aircraft for flight with an open entry in the Tech Log, but subsequently again reported the problem to *(Maintenance Control)* stating the vibration had got worse, but continued to the scheduled destination. I mentioned this to my Shift Manager and he said he would pass the information onto the *(Flight Operations Management)* in the morning of *(the following day)*. I did not think this was satisfactory; this is not the first time this has happened.

Other examples of this type of problem have also been detailed. The reporter has subsequently elected to submit reports through his Company Quality system. This is the correct course of action, as it allows the Quality Department to investigate specific cases, correlate reports with other cases and monitor trends.

(2)

The aircraft diverted to ##### *(Southern European airport)* after suffering a pressurisation failure of both systems while cruising en-route from the Mediterranean to UK. The aircraft arrived at the diversion airfield with all passenger oxygen masks deployed & oxygen generators depleted. A Station Engineer met the aircraft on arrival. The crew requested fuel and received an amended flight plan to continue to the planned UK destination at, or below Flight Level 100.

After refuelling, the aircraft continued to the planned UK destination with the passenger oxygen masks deployed. The defect had not been entered in the Technical Log prior to departure for the UK. There were no unused pages in the Tech Log on arrival in UK.

Although technical assistance was available at the diversion airfield, the Flight Deck crew elected not to have technical assistance for the turnaround. A Mandatory Occurrence Report was filed on arrival at the UK destination. The maintenance organisation has been advised of the Technical Log issues.

An interesting aspect of this incident is the departure of the aircraft with the 'rubber jungle' still deployed in the passenger cabin. There is no regulatory requirement for the oxygen masks to be re-stowed and this activity would have imposed a further delay at the diversion airfield. However, the presence of the deployed masks throughout the passenger cabin would have presented an unnecessary hindrance, should there have been a subsequent incident on the resumed flight, requiring an emergency evacuation. This matter has been passed to CAA (SRG) for their consideration.

In relation to both of the above reports, Pilots are reminded of their responsibilities regarding MELs and Technical Logs under Articles 16 and 38 of the Air Navigation Order.

Wasted Time and Too Few Certifying Engineers

First day on shift after three rest days, no sign of nightshift for verbal hand-over (an overlap of shifts is allowed for this). Read hand-over from the nightshift saying two defect cards for replacement of a (*component*) require clearing. The cards are very poorly written as to which (*component*) they refer to; the serviceable label found placed at random in the card rack. The *component* change log is not filled out. With part number and serial number from the serviceable label and reference to the IPC, finally locate replaced (*component*). Then look up tradesman's stamp on the approvals database. One and half-hours lost! At least this time the cards needing clearance had been referred to in the written hand-over.

Nightshift avionics only has radio cover for two thirds of the time, not allowing for leave and sickness. With promotions and retirements the position is likely to get worse. As a fully qualified avionics Engineer with radio cover, I find myself having to cover other areas leaving my normal 'gang' without technical direction while I am out of the hangar.

Unable to report to QA Department as our system is not confidential.

When referred to the organisation concerned, the response was that the

problem of establishment and scope of cover held by Engineers is the subject of management review. The organisation is currently engaged in an unusually high level of technical training. A number of actions have been taken, particularly with regard to avionic CRS cover.

Regarding confidentiality, the QA Department concerned has responded that reporters' identities will be protected, but reporters' names are required to permit a response to those raising reports.

Flight Operations Department Communications

The latest CAA (SRG) Flight Operations Department Communications have been issued since January 1998:

7/97

Engine Out Training and Testing - Turbo-jet Aeroplanes

8/97

Delay of Implementation of JAR-Ops 1.820 (Aeroplane Emergency Locator Transmitter (ELT) Requirements)

Delay of Implementation of JAR-Ops 3.820 (Helicopter Emergency Locator Transmitter (ELT) Requirements)

Amendment of the Air Navigation (Dangerous Goods) Regulations 1994

Seat Allocation

9/97

Continued Compliance with Airworthiness Notices

Extended Range Twin Operations (ETOPS) - Certificates of Release to Service

JAR-Ops Maintenance Programmes Approvals

Minimum Equipment List - Special Procedures

1/98

European BRNAV Operations

2/98

VOR/ILS Immunity to FM Broadcasts

Approaches to United States Airfields

Slush Covered Runways Friction Reports

3/98

Letter of Consultation - Proposed Mandate for the Carriage and Use of an Airborne Collision Avoidance System

4/98

Implementation of JAR-Ops

5/98

Permissions and Exemptions Expiring on 31 March 1998 - Extension of Effectivity