



CONFIDENTIAL HUMAN FACTORS INCIDENT REPORTING PROGRAMME

FEEDBACK

DECEMBER 1989

NUMBER 20

CHIRP Lives

Rumours of CHIRP's death have been considerably exaggerated. We've never been exactly flush with personnel in this office, but the dedicated CHIRP staff over the past six months or so could have been counted on less than one finger. We've tried to keep up with the incoming reports, but something had to give, and the victim was the August FEEDBACK.

The problem has been devising some means of relieving the CAA of cash to fund CHIRP that nevertheless maintained the independence and integrity of the scheme. This has been an excruciatingly tedious process, but there does now seem to be a glint of sunshine on the horizon, and, with a bit of luck, things will all be sorted out by about 1998.

In the meantime, we'll continue to do everything that we can to chase up your problems for you, and to get those things fixed that might have tripped you up. Please keep sending in the reports.

Fatigue

There are no fatigue reports in this FEEDBACK, but CHIRP has had its effects in this area. CAP 371 has been revised, and some elements of the CAA give all the credit/blame for this happening to CHIRP. There was some interesting discussion at a RAeS meeting a few weeks ago at which the CAA outlined the limitations in the new document (55 hours per week, 95 hours per two weeks, 190 hours per month). Whether the revised document will meet with your approval, however, is quite another matter. Doubtless you'll let us know.

Human Factors Exams

The existence of CHIRP is considerable evidence of the importance that is being given to human factors problems by the aviation industry. The enquiries we get from shipping, nuclear power, oil exploration, chemical, and other industries as well as groups like anaesthetists shows how far ahead aviation is in the whole business of human factors education and confidential reporting.

However, ICAO has now decided that there should be a considerable element of human factors knowledge assessment in pilot exams. It clearly won't be too long before all CPL, ATPL, and even PPL exams contain a human factors paper. Obviously we at CHIRP generally welcome this, and we'll be trying to help Cranfield with a number of courses aimed at improving education in this area. Details of Human Factors Courses at Cranfield can be obtained from the Short Course Office, Cranfield Institute of Technology, Beds.

Don't Forget . . .

- in this FEEDBACK your reports are in this typeface
and our (and CAA) comments are printed like this.

We'll be back in April (probably).

Have a good 1990.

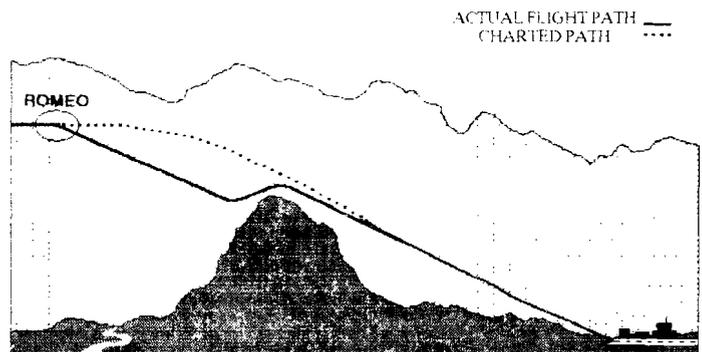
YES SIR, NO SIR, THREE BAGS FULL SIR!

● Captain is flying,
P1: I will start descent by 50nm from point Romeo.
P2: OK Captain.
P2: Shall I call KHATMANDU Tower to get you the latest?
P1: Yes.
P1: Descent checklist.
F/E: Read it all.
P2: How's your weather (KHATMANDU Airport W/D 090/10k 5000m 6/8 2000)
P1: OK.
P2: Captain we lost the VOR DME.
P1: It's OK I am using the Doppler DME.
P2: But Captain this is not approved for the approach.
P1: It's OK don't worry I have been coming to this airport for the last 20 years since the turbo and we used to come overhead and make spiral descent etc.
P2: But Captain we are below the MEA and I think the mountain ahead is shielding the VOR DME, don't you agree with me?
P1: No, you worry too much.
P2: KHATMANDU Tower, please confirm that your VOR DME is serviceable?
TWR: Affirmative, you are cleared for approach.
P2: Roger and for your information we have flags on both VOR/DME.
TWR: I confirm both are operative.
P2: Captain I am positive that you are low and the mountain ahead is shielding the VOR/DME signal.
P1: No.
P2: Captain I am very worried.
P1:
P2: [I looked outside and I saw the river which is before the mountain and I was very sure we were low and going towards the mountain.]
P1:
P2: For God's sake go up to the safe altitude and you can do whatever you want with me after landing.
P1:
P2: Go around Thrust F14.
[I pushed the 4 throttles and instructed the F/E to select F14]
P2: Captain climb to 13500ft now.
P1: [Just followed what I said without saying anything]
P2: Here is the mountain, just ahead see I said we were going to hit it. [We had seen the mountain by the time we passed 11500ft above cloud.]

Anyway, we continued the approach because when we climbed we vectored VOR/DME and our height now is proportional to "XXX height DME".

After landing the Captain thanked me and said SORRY. Therefore, when a Co-Pilot has the choice between his life or his licence and job choose your life and do what is necessary.

APPENDED: Sketch showing Khatmandu Airport, river, mountains, point Romeo etc.



● We were flying at FL370 over the Alps, I was a B720 F/O and everything was normal that night until we started flying over the mountains, then we started to encounter light turbulence increasing in intensity. With the increase in turbulence the attitude of my Captain changed, and here is the story as it happened.

Capt: I hate turbulence.

F/O : Me too.

Capt: Ask ATC to change FL.

F/O : Geneva request to change FL due turbulence.

ATC : OK descent to FL330.

At this time the turbulence increased to moderate. The Captain throttled back and started descent, the aircraft started to pitch up and move/yaw/roll just about any attitude you can imagine and I wasn't sure whether it was the turbulence or pilot-induced due to nervousness?! However what really matters is that the Captain throttled back at FL370 and I saw the nose going to 20 degrees pitch up and here is the conversation.

F/O : Pitch, pitch.

Capt: OK

Captain put nose down 15 degrees.

At this time the aircraft was so fast the MNO bell started to ring.

F/O : Speed

Capt: OK. (and he put the nose up 20 degrees to reduce speed, and throttles still idle at FL330).

F/O : Watch your pitch. Captain you will stall. Pitch, pitch, power add power you will stall.

Capt: Stop shouting. don't shout, shut up.

F/O : If you don't add power I will keep on shouting.

Capt: It's OK.

Anyway the rest of the flight was almost silence especially from my side.

Finally, to let you know. if we stalled from FL330 over the ALPS I don't think we would have recovered!!

These two reports represent somewhat extreme examples of the general problem of maintaining good crew co-ordination. Events that seem almost incredible when written down in black and white really do happen. The problem is that pilots don't stop being people when they get on to the flight deck: they take with them the bits of pride and prejudice that we all carry about in everyday life.

Reading CHIRP reports such as these suggests that there are four main factors that are important in understanding crew relationships, and these are personality, seniority, capacity, and perceived ability. To take a ridiculous example, it's clear that if we take a Captain with a dominant personality, lots of seniority (perhaps a training

Captain), who is actually handling the aircraft, and who the First Officer perceives to be able, it's clear that a submissive, junior, non-handling, First Officer with a brand new CPL is not going to be very likely to challenge the Captain. This was just about the situation in a Twin Otter in Canada a few years ago - the F/O got no response from the Captain to the approach checks, but didn't like to challenge him because he knew he was in a bad mood. In fact, the Captain had died of a heart attack, and the aircraft flew into the ground with no intervention from the F/O. One can't help wondering what would have happened in the two reports above if the First Officer had been rather less assertive.

The unassertive F/O and dominant Captain pairing is not the only problem, however, as there are plenty of accidents and CHIRP reports that illustrate the two Captain problem in which comment from one to the other may be inhibited because Captain A does not wish to appear to challenge the competence of his peer, Captain B. There are even examples in which Captain A will let Captain B go ahead and make a horlicks of something just so that he can score a few points off him.

It's asking a lot, but pilots really should be prepared to bury their pride when on the flight deck and behave in the way that they know to be rational, even if this means admitting a mistake, asking for advice, or taking a chance on upsetting somebody. When in doubt, speak out. At least you'll be alive to be fired.

...AND THIS IS A SLAP ON THE HEAD, MANUEL!

● Whilst, under BARCELONA control at FL330 and tracking 168 degrees M from QUV VOR, we were instructed to call leaving FL330. As we were without a flight level to go to, we questioned this request. We were then told to leave FL330 for FL210 "now" - we complied (this was 30NM before our desired descent point). Our rate of descent was requested, and replied as 1000fpm. We were then entertained by a rapid exchange of SPANISH on the R/T, and then told to increase our rate of descent to 2000+fpm. Again we complied, but started to take more interest in the "cincos, doses and ochos". It then became apparent that some one was getting clearances to our height + 1000ft whilst descending (no hassle, so far). Believing that we were "in someone's way" we requested direct IBZ from present position (10NMs out from LISAS), this was denied. More Spanish R/T occurred. As we approached ANDRAIX we requested further descent from FL210 - this was denied and we were instructed to steer 180 degrees M. We then requested to be informed of the position of the other aircraft and were told "2 o'clock range 5NM", and we made visual

contact on a B737-300. This aircraft was now rapidly clearing us to starboard (i.e. direct IBZ) and had been cleared to lower levels. We then asked the controller if that aircraft had been behind us, the answer was "no sir, he was always in front of you". Why he said that I will never know - because it was obviously a vast economy of truth, and clearly impossible. The flight continued with us being further delayed in descent clearances, and more Spanish R/T. We were now with IBZ approach and when the other B737-300 crossed the marker, he made his call in ENGLISH (not quite Queen's). The game was up, as far as I was concerned. On the ground I ran over to this other aircraft and checked his fuel state from his external gauges - it was 1250/1300kg i.e. the same as my minimum reserves. So this chap didn't have a fuel problem, but was purely cheating. He was an Air ***** 737-300 (E-****).

My purpose in writing this is to inform you and other pilots of what's going on down there, still! I hope that, CHIRPS Spanish Correspondent, will read this and ponder that the Armada was no accident, and we are not really as daft as our "cincos" suggest.

CONCEALED IDENTITIES

- Cannot something be done about the system of identifying on nav aids.

Why are some idents at such a slow rate, particularly NDBs?

Why don't VOR and DME idents alternate at a faster rate of transmission? If a DME idents once per minute then it could take over two minutes to properly ident two nav sets on each changeover. This then means that each pilot is "off the air" for a considerable time, and it could be up to a total of 4 minutes that only one pilot is on radio watch.

Why is it that some French VORs have a long constant tone in between idents?

Why are some VOR idents so noisy?

Are there any plans to replace morse code with voice generation as in the case of volmets? The London volmet computer generated voice is of exceptional quality. Please can someone sell the software to the French who persist with their inferior stuttering.

We contacted ATS Standards in the CAA, and they provided the following reply:-

"NAVAID IDENTITY SIGNALS

Taking the points in the order of the report:

1. CANNOT SOMETHING BE DONE...etc:

From the comments it would appear that most of the systems are operating within the limits given in Annex 10. Many of the older systems would have been manufactured to the minimum ICAO requirements, and would not be easy to change to more frequent keying. This applies particularly to NDBs, some of which still use mechanical keying devices.

2. NDB IDENTITY RATE:

According to the supplement to Annex 10, most of the NDBs in France are using CW identity (A1), and the ICAO requirement is that this type of beacon should identify only once per minute. This is reasonable since all guidance is lost during the identity transmission. France claims that the use of this type of beacon is necessary to allow a denser "packing" of NDBs due to the restricted transmission bandwidth compared with an A2 emission beacon.

ICAO requires that beacons using keyed tone (A2), and used as approach or holding aids should identify at least 3 times in each 30 second interval. As far as is known, all beacons in the UK meet this requirement.

3. VOR/DME ASSOCIATED IDENTITY RATES:

The requirement for associated keying is that in each 40 second interval, the DME should identify once, and the associated aid (VOR or ILS) should identify 3 times in succession. If the associated aid fails, then the DME should revert to identifying at least once every 40 seconds, but in this case, a faster rate would be permitted. As the DME cannot give distance information during the (key-down) period of the identity, it is reasonable to keep its identity signals well spaced, even though 40 seconds does seem a long time when listening.

If there are any DMEs with one minute between identities as claimed, they are outside the ICAO specification, and neither the UK nor France has registered any exceptions to this in the supplement to Annex 10.

4. FRENCH VORs WITH CONSTANT TONE:

At present we have no answer to this. It may be that the tone is required by the systems monitors, as in the case with certain other equipment manufactured in France. We are awaiting further replies on this point.

5. NOISY VORs:

There is insufficient information to give a specific answer to this question.

During flight checks in the UK, the inspector listens to the identity and would comment on any noisy signals. CAAFU advises that some of the ATIS recordings used on certain VORs have a lot of extraneous background noise, but this is caused by lack of care when the recording is made, not a fault with the VOR.

Perhaps this comment only applies to French VOR systems. CAAFU has promised to listen to some when they are in the right area. More details on this point would be helpful, ie specific VORs.

6. VOICE IDENTITY:

There are no plans to do this in the immediate future on UK VORs. It can't be done on an NDB, since the aerial circuit has such a narrow band width, even if the transmitter could apply the modulation, it would not sound correct in a receiver. The DME, being totally a pulse system, cannot be given speech modulation."

Next question please.

THE MIXING MILITARY MENACE

● Heathrow are on Easterlies and TMA NW is not really busy. Northolt request a HENTON departure release on a foreign military aircraft and I agree. They go WATFORD 3 BOVINGDON 4 HENTON 5. The departure calls airborne a few moments later and knowing that the SID route does not infringe that part of Heathrow's RMA where they can descend below MIN STACK I climb to 5000. Just then I notice GXXXX showing 2400ft Mode C tracking west about 4 miles NE of Northolt and a perfect ringer for the Northolt departure who is in his left turn off 07 for Watford and climbing well through 2000ft.

It later transpired that GXXXX was positioning from Stansted to do some kind of aerial task with Heathrow. A discussion had occurred between Stansted, Heathrow, and the TMA N Crew Chief on how the flight was to be conducted. It was decided not to force the old 748 up to flight levels and as TMA couldn't grant an altitude through the Heathrow departures the arrangement was for Thames Radar and Heathrow Director to work the transit and keep it clear of TMA traffic.

MY first reaction on seeing GXXXX was one of disbelief. "It can't really be there." My second was to tell the foreign military pilot to turn hard left immediately onto heading 290 degrees. He did this first time and without a murmur. I love him. The result was about one and a half miles and a lot of bad language from me. And I had to retrieve my aircraft from the wrong part of Heathrow's RMA.

I note with some horror that Northolt are not required to get departure releases from Heathrow. Probably none of us are whiter than white in this incident. I'm guilty at least of not filing an MOR, but I'd rather everybody hears about it than there's a quiet witch hunt. Should my Crew Chief have told me about GXXXX? Should I have checked the radar better before releasing the Northolt departure? All parties involved in London TMA traffic - make your own minds up, and take note!

AND ANOTHER MILITARY MANOEUVRE

● BACKGROUND

At the London Air Traffic Control Centre, each "Suite" is manned by, amongst others, a Chief Sector controller, and Sector Controllers. The Chief Sector Controller's main task is accepting traffic into the sector with PROCEDURAL separation, and co-ordinating traffic out of the sector on the same basis; and the issuing of joining/airways clearances to airfields, and airways crossing clearances to other ATS units. All these clearances are issued on a PROCEDURAL basis.

The Sector (Radar) Controller carries out executive control within the sector, to achieve the required PROCEDURAL levels co-ordinated when aircraft leave the sector.

PROCEDURAL SEPARATION

Essential to SAFETY is the over-riding rule of importance that an aircraft shall not be cleared to a level, or cleared to join or cross at a level, unless it is vacant. Thereby, in the event of a radio failure, or any other problem, the cleared aircraft can safely cross or join controlled airspace.

SCENARIO AND PROBLEM

Due to the high levels of traffic being experienced, the Sector (Radar) Controller is often working at full stretch. A method of operation by Chief Sector Controllers has begun to be used which is inherently DANGEROUS. The examples on the day given were all very similar. I have several aircraft on frequency. Workload is moderate to high. London Military Radar telephone the Chief Sector Controller requesting crossing clearance of Airway G1 with Military traffic at FL210. I have traffic on radar headings and under radar control, climbing and descending from the London TMA.

The Chief Sector Controller cannot interrupt me as I am too busy, so gives a crossing clearance at FL210 to London Military Radar. He is then trying to shout into my ear to stop descending and climbing traffic to facilitate this crossing clearance. On most occasions I was able to do this. However, on one occasion I had to give radar vectors to pass behind the military traffic, and on another, I lost two-way communications with a TMA inbound aircraft descending on a radar heading. After three calls I had failed to establish two-way contact and therefore

had not been able to stop the descent, and my aircraft was on a converging course with the military crossing aircraft. It is not often a Chief turns pale, but this was one of those occasions! Fortunately two-way contact was finally regained, and my traffic had its descent stopped off.

This situation is now quite common. It is unsafe. Either traffic must be stopped off to provide a cleared flight path PRIOR TO ISSUING AN AIRWAYS CROSSING CLEARANCE or Military crossing traffic must use the 5000 feet or 5 mile rule, vectoring clear of Civil Airways traffic. To make this worse, the above system is being used by newly validated Chief Sector Controllers who have been taught this method by "old hands"!

MORE FROM THE CAA

In FEEDBACK 19 we printed a report of a problem with fuel valve/boost switch confusion in a Bell 206 - fortunately with a happy ending. This prompted the following report, which highlights how little difference there is between the trivial incident and the fatal accident.

● About 3 years ago, in Nigeria, I was lucky enough not to be on board a Bell 206 helicopter which crashed when the Check Captain turned off the fuel valve in mistake for the boost switch. The Check Captain was killed. I feel that Bell Helicopters should be forced to either modify the switch positions or introduce a guard to the fuel valve to prevent inadvertent operation.

At the time of the Nigerian accident I wrote to Bell, the CAA and the Nigerian CAA expressing my concern, obviously the same thing still happens!! (I am of course assuming that the incident related in Feedback occurred on a Bell 206).

Let's have some action before someone else dies!

We naturally mentioned this problem to the CAA, and we're pleased to say that we were a bit behind the times. They had already issued an Airworthiness Directive in August 1988 which states:-

Bell 206 006-08-88 APPLICABLE to all Bell/Agusta Bell 206 series helicopters. COMPLIANCE is required not later than 3 months from the issue date of this Directive. INSPECT and MODIFY as follows:-

- 1. The hydraulic system switch must be relocated to a suitable position on the centre console, well away from the fuel valve switch. This relocation is to be the subject of minor modification action.*
- 2. The hydraulic system switch and the fuel valve switch must be inspected for wear affecting the operation of the switch. Any such wear is cause for replacement.*
- 3. The fuel valve switch must be coloured red.*

The following CAA AAD have been cancelled/superseded. 0122 PRE 78 0128 PRE 78 027-01-79 002-05-80

WHAT COMES IN FROM CREW AND ATC.

FLIGHT DECK:	42	ATC:	21
Fatigue, Commercial Pressure, CAP371	12	Management, Fatigue	7
ATC related	11	Staffing, Workload	4
Technical Problems, Equipment	8	Conditional Clearances	4
Own Errors	4	Own Errors	2
Miscellaneous	4	Pilots Not Complying.....	1
"Risky Shift" (FB19)comments/moans!	3	Lack of Equipment	1
		QNH/QFE.....	1
		Miscellaneous (Runway Capacity)	1

GUARANTEE NO RECORD OF YOUR NAME AND ADDRESS WILL BE KEPT

NAME _____
 ADDRESS _____

 PHONE No _____

DATE OF RECEIPT AT THE
 RAF INSTITUTE OF AVIATION MEDICINE

We ask that you give your identity only to enable us to contact you if we are not clear about any part of your account. In any event this part of the form will be returned to you, as soon as possible, to confirm that we have received your report.

YOURSELF	THE INCIDENT	
HOW LONG AN ATCO	DATE	ATC SERVICE(S) BEING PROVIDED
HOW LONG AT PRESENT UNIT	TIME	IN WHAT TYPE(S) OF AIRSPACE
ON DUTY AS	LOCATION & NEAREST REPORTING POINT	USING WHAT TYPE(S) OF RADAR
HOW LONG VALIDATED ON THIS POSITION	TYPE(S) OF AIRCRAFT INVOLVED	WEATHER
	AIRCRAFT IFR OR VFR	

Please use this space to write your account using extra paper if you need to

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YOURSELF	THE FLIGHT	THE INCIDENT
CREW POSITION	DATE	TIME (PLEASE STATE LOCAL/GMT)
TOTAL FLYING HOURS	FROM -	DAY/NIGHT
HOURS ON TYPE	TO -	LOCATION
THE AIRCRAFT	IFR/VFR	PHASE OF FLIGHT
TYPE		
No OF CREW	TYPE OF OPERATION	WEATHER (IMC/VMC)

Please use this space to write your account, using extra paper if you need to

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