HURRY UP SYNDROME

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Take your time !

Aviation's worst disaster, the terrible KLM / Pan Am accident at Tenerife,, was due in great part to schedule pressure p r o b l e m s experienced by both flight crews. The Air Line Pilots Association (ALPA) conducted an eighteen month, three country investigation of this accident, with an emphasis on the human factors of flight crew performance, ALPA found that the KLM crew had strong concerns relating to duty time, specifically that they would be able to return to Amsterdam that evening and remain within their duty time regulations. They also expressed concern about the weather and its potential to delay the impending take-off. The cockpit voice recorder indicated the KLM captain said, *"Hurry, or else it [the weather] will close again completely".*

Pan Am's crew was equally concerned with potential weather delays. They were detained for more than an hour due to the KLM flight crew's decision to refuel. The KLM aircraft and fuel trucks blocked the taxiway, thus preventing Pan Am's departure. These schedule related problems set the stage for the catastrophe that followed.

HURRY-UP STUDY

This review of the *Hurry-up* Syndrome is an adaptation of a research study in which we examined 125 ASRS incident records that involved time related problems. We define *Hurry-up* Syndrome as any situation where a pilot's human performance is degraded by a perceived or actual need to hurry or rush tasks or duties for any reason. These time related pressures include the need of a company agent or ground personnel to open a gate for another aircraft, pressure from ATC to expedite taxi for take-off or to meet a restriction in clearance time, the pressure to keep on schedule when delays have occurred due to maintenance or weather, or the inclination to hurry to avoid exceeding duty time regulations.

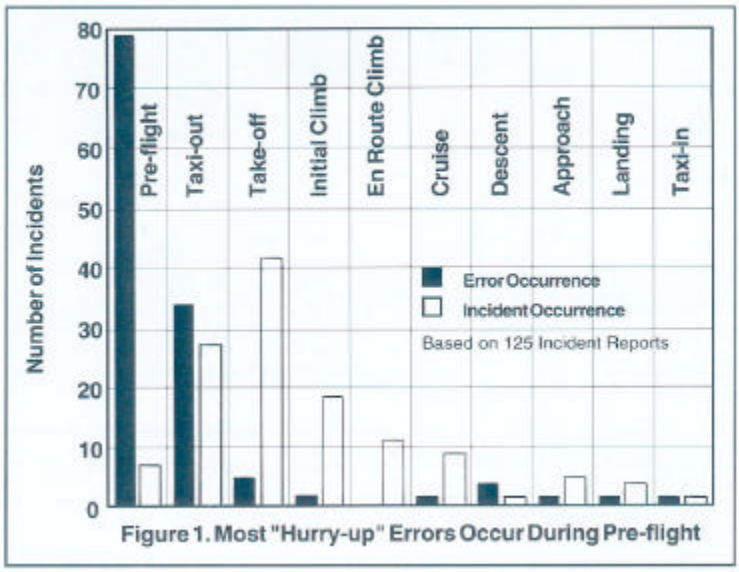

Figure 1. Most "Hurry-up" Errors Occur During Pre-flight

ERRORS AND INCIDENTS

Each time-pressure incident had a point where the error occurred (Point of Error Occurrence), and another point, either immediately or further downstream, where the result(s) of the error(s) actually manifested themselves (Point of Incident Occurrence). Figure 1 shows the relationship between the error and incident occurrence for various flight phases.

Point of Error

A large majority of incidents 63 percent) had their origins in the pre-flight phase of operations. For example:
"...Inbound flight was late and we were rushed because of the scheduled out time report card mentality ... It turns out that the clearance / got on ACARS was for the inbound flight. The squawk was incorrect, the altitude was wrong and so was the departure frequency... " (ACN 200800)

The taxi-out phase accounted for the second highest number of error occurrences, while all other operational phases combined amounted to less than 10 percent.

Point of Incident Occurrence

The errors made in pre-flight and taxi-out often manifested themselves later, during take-off and departure. One reporter writes:
"...we were busy with checklists and passenger announcements, while changing to Tower frequency. [The] Tower cleared us for immediate take-off, and even though we had not finished our checklists, / taxied our aircraft into position and started to advance the power for take-off .. After about 1 000 feet of take-off roll, Tower cancelled our takeoff clearance ... [we] asked the Tower why we had our take-off clearance cancelled ... the first officer said [that] we were not on the runway. At that point I realized we had started our take-off roll on an active taxiway. " (ACN 134919)

The next most common category for incident occurrence was the taxi-out phase with 22 percent of all reports:
"Aircraft expediting taxi after an extended maintenance delay, failed to follow cleared routeing and ended [up] on the active runway ... first officer busy with check-list ... captain rushed due to schedule pressure..." (ACN 55009)

WHO MADE THE ERROR?

Errors can be made by one individual, or they can be made by the flight crew as a collective unit. The majority (68 percent) of errors appeared to be collective. Collective error on the part of a three-person flight crew is well illustrated by the following report:

"... *I am relatively new at this position as second officer.. We had a tailwind which precludes reduced power [for take-off] in this aircraft, but they [captain and first officer] did not notice and I was so rushed that / did not back them up and notice. So we took off with reduced power.. We were just in too big of a hurry to get everything down and do it correctly."* (ACN 67122)

DOING SOMETHING WRONG, OR MAYBE NOT AT ALL

Human errors may be categorized as errors of commission or omission. Errors of commission are those in which pilots carried out some element of their required tasks incorrectly, or executed a task that was not required and which produced an unexpected and undesirable result. Errors of omission are those in which the pilot neglected to carry out some element of a required task.

Errors of Commission

Sixty percent of human hurry-up errors were errors of commission. In the following example, the flight crew erred in not adequately examining the airport surface chart:

"Take-off was made from displaced threshold instead of beginning of paved runway. I feel some contributing factors were: Not studying airport runway chart closely enough to realize. We had an A TC delay and were at the end of our take-off release time... " (ACN 96427)

Errors of Omission

In 38 percent of instances, pilots made errors of omission. In the following report, the flight crew neglected an important element of pre-flight preparation - with annoying and unnecessary results:

"*Got a pod smoke warning from central annunciator in cruise en route between Fresno and Ontario... Diverted to BFL ... no evidence of fire ... we found a placard, which showed the pod smoke detection system as deferred and inoperative... We were pressured to hurry, and in the process, failed to check the aircraft log prior to departure."* (ACN 12974)

FACTORS THAT PROMOTED ERRORS		
FACTORS	**CITATIONS**	**% DATA SHEET**
High Work load 1) Time Compression due to delays (49%) 2) Other Miscellaneous (15 %) 3) High Workload Flight Phase (14 %) 4) Pre-occupation with Check-List use (12%) 5) Operational Procedure (7%) 6) Loss of Positional Awareness (4%) 7) Loss of Situational Awareness (3%)	**100**	**80**
Physical or Motivational States 1) Mental / Emotional Predisposition to Hurry (64%) 2) Physically Induced Predisposition to Hurry (21%)	**92**	**74**
Delay (Source of Delay) 1) Other factors Not Listed Below (25%) 2) Maintenance on Aircraft (14%) 3) Nature of Delay Unspecified by Reporter (10%) 4) ATC Clearance Delays (8%) 5) Weather (6%) 6) Ground Crew Problems (3%) 7) De-Icing / Anti-icing (2%) 8) Dispatch Office Problems (2%)	**69**	**55**
Social Pressures 1) Pressure from Gate Agent / Ground Crew (25%) 2) Peer Pressure (14%) 3) Supervisory Pressure (1%)	**48**	**39**
TOTALS	**309**	**247**

Note : This table is based on 309 citations from 125 reports.

WHAT LED TO THE ERROR?

In each incident report, one or more contributory or causative event promoted *Hurry-up* error on the part of one or more of the flight crew. As noted in Table 1, high workload was cited in 80 percent of all incidents, while problems involving physical or motivational states were next with 74 percent of incidents.

Various Schedule Pressures

FAA publication of on-time performance figures for air carriers leads to "keep-to-the schedule" pressures for flight crews and other company personnel. Similarly, conducting quick turnarounds (typically for economic reasons), can also lead to schedule pressures for pilots. In the following narrative, the reporter attributes his emergency to company schedule pressures:

"Engine cowling became unlatched after take-off, oil pressure was lost and precautionary shutdown was completed. Emergency was declared. Uneventful landing and taxi to gate ... My company is very concerned with on-time departures, however, they do not give enough time in scheduling to turn the aircraft [round] safely .. everyone involved was rushed. (ACN 147822)

ATC may contribute to the *hurry-up* mindset by requesting an expedited taxi or an intersection departure, by issuing a "clearance invalid if not off by..... or other time-sensitive requirements. (Of course, ATC personnel are similarly under pressure to maximize traffic flow.) In this example, the flight crew clearly felt pressured by ATC:

"Our inbound aircraft was late arriving and upon receipt of our ATC clearance for our outbound leg, we were informed we had an xx:xx *wheels-up time. Needless to say, we were rushed... about 100 yards before reaching the end of the runway we were cleared for takeoff on runway 12 ... / taxied onto what / thought was 12R, but what was actually runway 17.* (ACN 102290)

Table 2. Incident Results

Factors	Citations	Percent
Deviation from ATC Clearance or FAR	60	48
Deviation from Company Policy/Procedure	26	21
Runway Transgressions	21	17
Miscellaneous Other	20	16
Aircraft Equipment Problem	15	12
Altitude Deviation	14	11
Fuel Errors	13	10
Dispatch and Paperwork Errors	12	10
Landing or Take-off Below Minima	11	9
Track or Heading Deviation	11	9
Totals	**203**	**163**

Note 1: This table is based on 203 citations from 125 reports.
Note 2: Multiple responses are permitted for each category, thus there can be more citations than the total number of reports.

THE END RESULT

What types of incidents result from *hurry-up* errors? Deviations from Federal Aviation Regulations and/or ATC clearances are most common, and deviation from company policy or procedure is next. As indicated in Table 2, the remainder of the incident results comprise a fairly broad spectrum of problems.

PREDICTING AND AVOIDING HURRY-UP ERRORS

Hurry-up errors appear most likely to occur in high workload operational phases, specifically in preflight and taxi-out. External distractions and schedule pressure are significant pre-disposing conditions, but why is that so in these but not in other flight phases?

Most flight phases of air carrier and commuter operations employ well designed standard procedures that are linear in nature - a given required task follows another required task. For example, in the take-off phase the application of power is followed by a check of engine performance or power, which in turn may be followed by a performance check at 80 knots, and V1 VR, V2, gear and flap retraction respectively, depending on the particular aircraft and operator.

In contrast, duties in the pre-flight phase may be non-linear, i.e., there may be no logical or prescribed sequence. A pilot may need to deal with flight planning, weather information and changes, fuel loading, dispatch manifests and release, last-minute maintenance or MEL items, duty time requirements, or aircraft de-icing at pretty much the same time. There may be no standard operating procedure (SOP) for assigning sequence or priority to these tasks, nor does one task

necessarily or obviously require that another task be previously and correctly completed. Thus it may be easier to make an undetected error. On the other hand, tasks or duties in the taxi-out phase should be linear, yet this was the second most common flight phase for error occurrence. It is possible that many flight crews have not cleanly transitioned from one flight phase to the next, and may be trying to complete pre-flight duties during taxi-out. Another thought is that pilots may experience difficulty in the transition from the non linearity of pre-flight activities to the linear duties of the taxi-out phase.

Returning to the issue of pre-flight activities, it may be appropriate to examine cockpit or crew coordination. In an in-flight phase where the flight crew is seated together with unrestricted capability for interpersonal communication, the practice of Crew Resource Management (CRM) is facilitated by physical proximity and access. In the pre-flight phase of operation, interpersonal communication may be degraded by physical separation of flight crew members, and by distraction from numerous external sources.

RECOMMENDATIONS:

It is suggested that companies and flight personnel consider providing greater structure to pre-flight activities in order to reduce the frequency of time related errors. Similarly, when distraction and schedule pressure are seen to occur in this flight phase, a reasonable response is to slow down and carry out tasks in as linear a fashion as practical. Where time related pressure is encountered from external sources, pilots may find it a good strategy calmly to explain the nature, probability, and typical results of *hurry-up* errors to those who "apply the pressure".

- Maintain an awareness of the potential for *the Hurry-up* Syndrome in pre-flight and taxiout operational phases.
- When pressures to "hurry up" occur, particularly in the pre-flight operational phase, it is a useful strategy for pilots to take the time to prioritize their tasks.
- If a procedure is interrupted for any reason, returning to the beginning of that task and starting again will significantly reduce the opportunity for error.
- Practising positive CRM technique will eliminate many errors. Effective crew coordination in "rushed" situations will catch many potential problems.
- Strict adherence to checklist discipline is a key element of pre-flight and taxi-out task execution.
- Defer paperwork and non-essential tasks to low workload operational phases.