The Business Case for human Factors Programmes in Aviation Maintenance

The following document is the product of the brainstorming session that was carried out as part of the Mini Conference at Gatwick on the 8th December 2000. Maintenance organisations do not always live up to their own standards, whether management led or staff generated, shortfalls exist. However, although this may be a fact it is not openly addressed in every company. This workshop was addressing ways that the maintenance and engineering divisions of the aircraft operators, or stand-alone maintenance organisations can develop strategies to get top management support for human factors programmes.

Firstly, it is necessary to accept that a human factors programme is not only a matter of giving the staff human factors training. Training is ideally the beginning not the end. The workshop developed a series of lists that follow, which can be used to identify areas of the business that are suffering from poor performance. The thrust of the workshop was to put human factors issues and more broadly safety into a presentation form that would be acceptable to the Board. This was to be achieved by demonstrating the potential benefits in addressing specific human factor related issues that were causing a lack of aircraft availability and therefore potential revenue loss.

Secondly, it was strongly suggested that the approach to be taken is step by step, starting small and dealing with one problem in a concentrated and managed style and building on successes. This was preferable to trying to resolve all human factors issues simultaneously and under achieving and losing credibility.

Aircraft maintenance and engineering, in safety terms, performs very well, it is staffed by people who care about safety, and generally produce a high quality product in terms of airworthy aircraft for the airlines to operate. However, we do make mistakes and in isolated situations are part of the causal chain on accidents and incidents, in fact currently the trends indicate a slightly worsening record, in which human error plays a large part. It is dealing with the issues that stop us resolving the underlying causal factors that are feeding this trend that the mini conference was focussed on. A key theme of maintenance human factors that pervaded the morning papers and the workshop was encapsulated in a light-hearted line from one of the speakers:

The maintenance environment can be likened to someone switching a light on in a brothel! We all know what's going on, but nobody wants to see!!

The intention of this working group, this and future seminars is to ensure that the light gets switched on more frequently, in order that the aviation industry will face some of the realities of the maintenance workplace that threaten safety.

Improving the Maintenance Culture and using Human Factor Improvement Initiatives to Generate Revenue.

The monetary amounts quoted below are not based on fact for the industry, but were a generalised cost factor that members of the brainstorming groups felt represented in their own companies.

What are your Revenue Losing Factors:

- Aircraft not available for operational use
  - Maintenance Delays
  - Damage to the aircraft
  - Hull losses
  - Poor planning of utilisation of the aircraft
  - Sub-standard contracted support services
- Incurring on-costs from lack of availability
  - Additional landing fees
  - Passenger accommodation
  - Passenger sustenance
  - Chartering replacement aircraft
  - Transferring Passengers to third party airlines
  - Ticket refunds
- Increased insurance due to poor performance record
- Damage to the Company's Reputation
  - Customers fail to buy tickets or a reduction in sales post an incident/accident.
  - Clients place their contracts with other companies.
  - The regulator increases his surveillance interactions with the company.
  - Code share deals are rescinded.
  - Foreign destinations deny the company continuing access to destinations.
- Theft from the Company
- Incurring contractual penalties from clients
- Loss of routes or contracts

Where are you incurring costs or wasting resources.

Estimates per company (subject to use of multipliers to reflect aircraft types operated as large aircraft have larger costs and vice versa):

- Airborne turnback — £10.000 per annum/per aircraft, or 3 transatlantic club class seats per year.
- Doing the same job twice — £12,500 per annum/per aircraft, or 4 transatlantic club class seats per year.
- Wrong parts installed — £20,000 per annum/per aircraft, or 6 transatlantic club class seats per year.
- Cross-connected systems — £30,000 per annum/per aircraft, or 9 transatlantic club class seats per year.
- Mis-diagnosed Defects — £30,000 per annum/per aircraft, or 9 transatlantic club class seats per year.
- Non-focussed training — £10,000 per annum/per aircraft, or 3 transatlantic club class seats per year.
- Prescriptive regulations — £10,000 per annum/per aircraft, or 3 transatlantic club class seats per year.
- Ramp damage — £40,000 per annum/per aircraft or 12 transatlantic club class seats per year.
- Absenteeism — 11 mandays per staff member per annum.
- Stress — 50 mandays for every 20th staff member per annum.
- Lost time injuries — 3 mandays per staff member per annum.

Listing of Human Factor Related Revenue Loss Contributors

- Lack of Motivation,
- Lack of Supervision
- Lack of training or specific task competence
- Poor Planning (related to Stores Supplies, Technical Support, Manpower, Handover, work scheduling)
- Insufficient time to carry out the task correctly
- Failure to follow procedures
- Poor design (includes poor ergonomics and man/machine interfaces)
- Excessive commercial pressure
- Stress (real or perceived)
- Poor communication (includes, handover, writing worksheets and log book entries, guidance from supervisors and the unintentional management body language messages of impatience and intolerance).
- Lack of teamworking
- Changes in working practices (includes those not adequately managed through a change management process)
- Environmental Factors (includes Noise, Heat, Cold, Lighting, night working)
- Distraction
- Poor housekeeping

Reducing costs by preventing duplication of work

One approach that was brainstormed was outlined below, but insufficient time remained in the workshop to complete this process using the model document covered in the business case example.

- Establish management standards
- Simplify the instructions.
- Train the staff, but using only training that will address detailed specific organisational needs for relevant individuals.
- Improve planning
- Improve Technical Records control
- Improve supervision