Virgin Atlantic Airways

Virgin Atlantic Airways – Electronic Log – It’s (NOT) simple

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History
History

1984 – Originally named British Atlantic Airways with the strange idea of flying between London and the Falkland Islands. Changed to Virgin Atlantic Airways later that year when Richard Branson joined.

22nd June 1984 – First scheduled service from LGW to EWR using a leased 747-200 (1 year hand back deal).
History

Current Fleet

- A340-600 → 11
- A330-300 → 8
- B747-400 → 8
- B787-9 → 13
- A350-1000 → (12)
History
The Project
Electronic Log Book - Project

It’s simple – just make an electronic version of the paper log!!
Electronic Log Book - Project

Delivered with the VAA 787 Aircraft. For VAA this is a BOEING product.

Project started early 2013 with an expected delivery of the first aircraft around October 2014. This initially sounded like a lot of time.

Project team created. This was a small team comprising a PM, BA and Business experts.

It was sold to the business based on the following key benefits.

- OTP – reduction in delays and cancelations
- Efficiency – saving in data transcription and auditing costs
- Cost – reduction in printing paper logs
- Data Quality – improved accuracy and consistency
- Real Time Data – having fault information as it happens.
Electronic Log Book - Project

Aircraft Systems.
Corenet + Comms
Electronic Log Book - Project

- Hosted Environment
  - BEGGS
  - Golden Copy DB
  - Access To Data Centre And AHM

- MQ Series
  - MQ Series and PDF archive report

- VAA Environment
  - M&E DB

- Symantic VIP
  - User Validation (Web Service)

- FlyDocs Archive reports.
Electronic Log Book - Project

Initial plan was to have the ELB live on the first aircraft including an interface with our M&E system. Due time constraints the interface was dropped until post first aircraft.

Started engagement with the CAA from the onset of the project.

We started looking at how we could use the ELB with version 1.1 and by the end of the project we went live with version 1.3.5

We spent a lot of time with the SLT mapping out the gaps between our current processes and what the ELB could deliver. Several changes were requested.
Electronic Log Book - Project

Biggest learning curve was with the configuration file. The application did not come with any usable documentation on the configuration file options. We spend many hours with Boeing trying to learn all the settings.

Fault Tree – We accepted the Boeing delivered technical fault tree with minor changes. However we created our own Cabin fault tree from scratch.

Learn XML and get a good XML editing tool. We use XMP Spy.
Electronic Log Book - Project

Configuration file – currently around 1500 lines.

```
<TechnicalDefectNumbers>
  <SortOrder>1</SortOrder>
  <NumberPattern>A99999</NumberPattern>
  <CounterName>MaintRecordName</CounterName>
  <MinimumSequence>T00001</MinimumSequence>
  <MaximumSequence>T99999</MaximumSequence>
</TechnicalDefectNumbers>

<FuelRecordNumbers>
  <SortOrder>5</SortOrder>
  <NumberPattern>AA9999</NumberPattern>
  <CounterName>FuelRecordName</CounterName>
  <MinimumSequence>FL0001</MinimumSequence>
  <MaximumSequence>FL9999</MaximumSequence>
</FuelRecordNumbers>

<NumberSortOrder>DESCENDING</NumberSortOrder>
</RecordNumbering>
```
Electronic Log Book - Project

Fault Tree– currently around 26000 lines.

```xml
<Fault cabinVisible="true" cabinReportable="true" ata="2541" code="T00">
  <Label>Lavatories</Label>
  <Description>Lavatories</Description>
  <Faults>
    <Fault ata="2541" code="T10">
      <Label>Amenity Rack</Label>
      <Description>Lavatories - Amenity Rack</Description>
      <Faults>
        <Fault ata="2541" code="T10 10 --"">
          <Label>Damaged</Label>
          <Description>Lavatories - Amenity Rack - Damaged</Description>
          <LocationGroups>
            <EnumeratedGroupName>Lavatories</EnumeratedGroupName>
          </LocationGroups>
        </Fault>
        <Fault ata="2541" code="T10 11 --">
          <Label>Missing</Label>
          <Description>Lavatories - Amenity Rack - Missing</Description>
          <LocationGroups>
            <EnumeratedGroupName>Lavatories</EnumeratedGroupName>
          </LocationGroups>
        </Fault>
      </Faults>
    </Fault>
  </Faults>
</Fault>
```
Electronic Log Book - Project

Signature Validation.

There are options on electronic signatures.
  ➢ Use Ultramain UUAS
  ➢ Use Active Directory
  ➢ Use a 3rd party system

We evaluated all options. The UUAS was an additional cost. The use of AD accounts presented too many technical issues. We looked at other options and came across Symantec as it was being evaluated by another part of the airline.
Electronic Log Book - Project

Signature Validation.
Electronic Log Book - Project

Training and Documentation.

We produced full user guides for each element of the software. These were very time consuming to create and a pain to update with each new version of the software. In addition we produced Quick Reference Guides.

Engineers  Flight Crew  Cabin Crew  Back Office
Electronic Log Book - Project
Electronic Log Book - Project

Obtaining Paperless Ops Approval

We looked at 3 options to obtain full approval.
- Full paper parallel run with a fixed time
- Use ELB and print to paper during parallel run
- Bit of both with set validation points

VAA's approach was to do a parallel run with validations every 12 sectors. The validation would be between the Paper Log and the ELB Ground Archive report. We did this over a 4 month period.
Electronic Log Book - Project

Obtaining Paperless Ops Approval

Initial issues
- Several TCS issues – this also exposed an ACARS uplink problem.
- ELB losing deferrals – software issue with the last 30 sector limit.
- Authentication failures – data routing issue at VAA.
- Software issues.
- Auto Start flight function (Training Flights).

The TCS issue has been resolved but we still have the occasional problem. ACARS now works satisfactory. VAA have implemented better monitoring of the SigVal messages. Most of the other issues were resolved with V1.3.5.0 OP version of ELB.
Electronic Log Book - Project

Obtaining Paperless Ops Approval

During the whole Ops Approval period we never lost any ELB data. Most of the data issues were with Engineers or Flight Crew badly transposing the ELB data onto the Paper Log.

We did 2 Paper Back-Up trials. The first threw up a few process issues which were corrected for the second trial. Both were done on commercial services.

A full report was submitted to the CAA and we received full paperless approval on the 9th March 2015.
Electronic Log Book – Current Status

Stats so far.

- We have 13 aircraft with the ELB (V1.3.7.0 OP).
- On average we fly 22 sectors per day across the 787 fleet.
- Average 3 Tech Log defect and 4 Cabin Log defects per sector.
- Approximately 200 SigVal messages a day with 2% failure rate. Most failures are due to bad data entries or message latency.
- We have had several incident where we had to revert to paper backup. These have mainly been root caused to EFB issues or Connectivity issues.
- To date our ELB’s have created 31K Tech Log entries and 29K Cabin Log entries.
Electronic Log Book - Project

Did we meet our project goals?

- OTP – reduction in delays and cancelations
  - So far we cannot prove either way.
- Efficiency – saving in data transcription and auditing costs
  - Not at the moment as we are still working on the M&E interface.
- Cost – reduction in printing paper logs
  - Yes.
- Data Quality – improved accuracy and consistency
  - Yes but there is still some room for improvements.
- Real Time Data – having fault information as it happens.
  - Yes.
Lessons learned
Electronic Log Book – Lessons Learned

P

PROCESSES

P

PRACTICE
Training flights.

VAA decided to do a lot of training flight to get crews approved as quickly as possible. This caused issues with operating the ELB.

We have training details that look like this.

![Training Details Image]

But operate them as two flights.
This is when we got to understand the Auto Start flight functionality.
Electronic Log Book – Lessons Learned

The simple things they cannot get right.

The Flight Crew still cannot get this simple screen right. For Flight Number we require the commercial flight number. The crew keep entering the call sign.

VS 0002 EWR to LHR – should be entered as “0002” yet they keep entering “VIR02E” which is the call sign as shown on the flight plan.
Electronic Log Book – Lessons Learned

- You need good business involvement from the start.
- You need a dedicated team – no other business distractions.
- Mapping current business use of paper log took a long time.
- This is a very time consuming project, so start as early as possible.
- Process, process, process and practice.
- Expect the unexpected – people will do what you least expect.
- You need to spend a lot of time on the Fault Tree.
- Give the Engineers access to a training device.
- Comms off the aircraft can be a problem (TCS and Corenet issues).
- Frustration with differences between EFB Client and Maint Laptop Client.
- Class 3 hardware can cause issues (too slow and old).
Questions ?