

FPL 2012: GETTING ISSUES SOLVED

How flight plan converters can bridge the transition period to ICAO's new format – and help save investment costs

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According to Amendment 1 to ICAO Doc. 4444, applicable from 15 November 2012, the format of flight plans will be changed. This will require changes to all ATC systems that process and use flight plans. The transition to the new format not only creates more or less temporary compatibility problems but also calls for large monetary investment.

At first sight the new and present flight plan formats appear to be as alike as two peas in a pod, which is due to the fact that all flight plan fields actually stay unchanged in Amendment 1. However the meaning of these items and their coding within the new flight plan will greatly change in comparison with the present format, making them incompatible with each other.

The revision of the format primarily became necessary due to its inability to express modern equipment and capabilities of aircraft. The differences between the formats are widely spread throughout fields 7, 8, 10, 13, 15, 16 and 18, with fields 10 and 18 having the most extensive changes.

Peaceful coexistence of formats?

In coming years airlines, air navigation service providers and military organisations will certainly benefit from the improvement. Until then, however, coordinating the transition from the current to the new format poses a tremendous challenge as the simultaneous transition of all flight plan

processing systems worldwide is simply not realistic. ICAO has therefore defined an interval during which the coexistence of both new formats will be tolerated. But it remains realistic to assume that even after 15 November 2012 quite a number of flight plan processing systems won't be running with the new format for a number of reasons, not least because the highly specialised systems comprise costly investments that should be protected. Replacing these systems before end of their scheduled lifespan should be avoided.

According to recent polls, many affected organisations worldwide have not made specific plans to transfer all their systems by the target date. Even if many central systems will be modified by the deadline it is likely that some subordinate systems won't make the date due to lack of time or budget. Consequently the transition will most likely not be completed after only a few weeks and there will be an extended period in which users and systems will have to cope with two coexisting format types.

Flight plan conversion scenario

An efficient flight plan converter can help avoid high investment costs for new equipment or expensive software updates. ICAO has defined comprehensive conversion rules to enable the assignment of each item of the new format to the present format. Ironically these rules were not defined identically for the various

ICAO regions, which has caused a difference in the conversion rules for the EUR/NAT region compared with the ASIA/PAC region.

Imagine the typical scenario (Figure 1) in which a flight data processing system only interprets the present format. Hence all flight plans addressed to this system are to be converted from 'new' to 'present' prior to feeding them into the system. Otherwise they will be misinterpreted or the respective system may experience a major malfunction. In case the system above sends flight plans in the present format, they need to be converted to 'new' in order to be interpreted correctly by other systems expecting to receive their

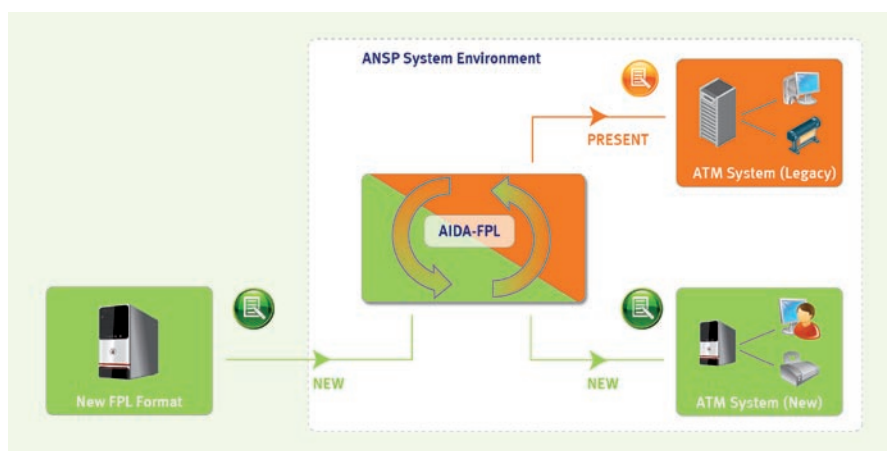


Figure 1: Conversion from 'new' to 'present'

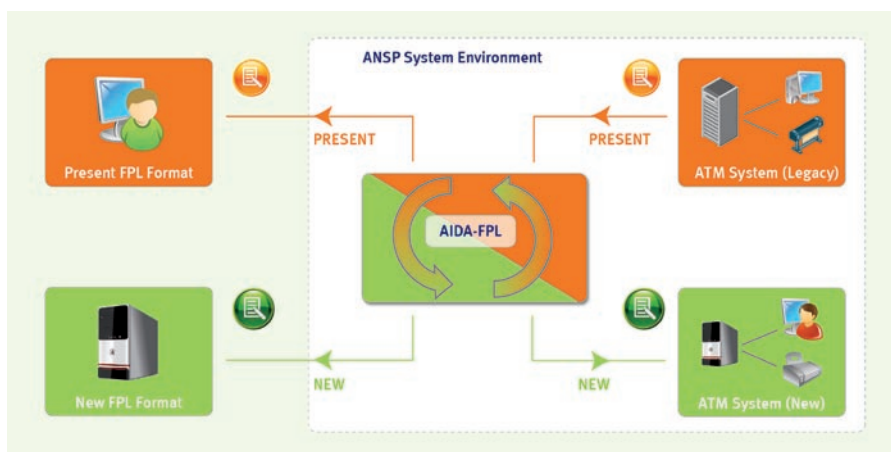


Figure 2: Conversion from 'present' to 'new'

flight plans in the new format (Figure 2). As of November 2012, systems do not necessarily need to be capable of accepting the present format. As a matter of fact there are implementations of flight data processing systems on the market that exclusively handle the new format.

Is converting between formats possible without any data loss? This question can clearly be answered through the fact that the conversion process was entirely described in the ICAO conversion tables, meaning that all contents of the new format can fit in the present format. Additional content in the new format are coded in field 18 of the present format, which can by definition contain free text. Therefore no information is lost during conversion. However the conversion is by no means trivial for the converter as it has to interpret flight plans correctly up to a certain degree in order to generate a reliable conversion.

The conversion from present to new format can be conducted in a similar manner. The sender of a flight plan in present format has to make sure that all information necessary for creating a flight plan in the new format is included. By doing so, information can be accurately converted in this direction.

Date of flight conversion

A peculiarity when converting flight plans is the specification of Date of Flight (DOF) in the new format, which allows flight plans to be filed up to five days in advance. Although this procedure has been common practice in various regions for quite some time, there are flight data processing systems that fail to interpret DOF and mistakenly expect the departure time to be within the next 24 hours. Without its proper conversion this would lead to a fundamental misunderstanding of the DOF and make the flight plan worthless.

If the DOF is set for any time later than one day in the future, messages have to be stored temporarily after being converted from 'new' to 'present' and may be sent out at the earliest 24 hours before the actual departure time.

AIDA-FPL solves the issue

Comsoft has, at an early stage, identified the necessity for a powerful flight plan converter that not only provides a workaround for the impending transition but actually embodies a permanent and comfortable solution to cater for the coexistence of the both formats. The flight plan gateway AIDA-FPL was designed to apply elaborate algorithms for automatic conversion with minimum manual intervention. Particular attention was paid to suitable error-handling mechanisms for the

treatment of erroneous flight plans. These algorithms require a certain degree of resistance to errors in flight plans to avoid extensive manual cleaning up. In addition errors in flight plans need to be identified to enable them to be reported to the system administrator and, if configured accordingly, to the originator to avoid their recurrence in subsequent flight plans. In this way the converter also contributes to an automatic quality control and constantly increases the quality of flight plans.

AIDA-FPL also provides a comfortable HMI for configuration purposes and a graphical display of the converter and connection status. The rich SNMP MIB allows the seamless integration of the converter's monitoring and control functions into an existing network management system.

Safety first

Both the conversion and processing of flight plans are highly safety-relevant. Comsoft therefore developed AIDA-FPL as a specialised gateway based on the company's proven aeronautical messaging gateway AIDA-NG. AIDA-NG has already shown its compliance with the strict Eurocontrol Safety Regulatory Requirements (ESARR) in numerous safety critical environments and is in operation in nearly all leading aeronautical communication centres worldwide as a national AFTN/AMHS/OLDI gateway.

To ensure the accuracy of the conversion algorithms the converter was 100 percent counterchecked for conformance with ICAO's conversion rules and was further scrutinised with a multitude of possible combinations of flight plan contents. To prove its stability under real circumstances, Comsoft's experienced engineers tested the converter with numerous randomly picked flight plans in the present format. As a final point, it turned out that the system did not automatically convert flight plans that were particularly erroneous and therefore unusable for final processing anyway.

Conclusion

The transition of the flight plan format in November 2012 constitutes a massive challenge to all flight plan processing organisations. The expected compatibility problems and massive financial burdens for system owners can efficiently and cost-effectively be avoided by means of a flight plan converter. With AIDA-FPL Comsoft has developed a solid converter that fulfils the highest safety and comfort demands while greatly contributing to the seamless transition to the new flight plan format. ❖