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JET FUELS FROM NON-TRADITIONAL SOURCES ARE BECOMING A REALITY

SUMMARY

The recent publication of Issue 26 of the Aviation Fuel Quality Requirements for Jointly Operated Systems (the AFQRJOS or Joint Systems Check List) represented a significant milestone. The Check List now allows Jet A-1 blended with up to 50% by volume of components from renewable sources. This is a significant step forward for the sustainability of commercial air transport and it should require no additional handling procedures for airport fuelling operations. All of the development work on alternative fuels for aviation was formulated on so-called “drop-in” fuels. It is intended that these new fuels will not necessitate changes to aircraft or supply infrastructure.

For carbon tax administration, there may be extra requirements at airports for tracking batches but this will depend on how credits for renewable fuels work in practice.

BACKGROUND

Over the past 5-6 years major efforts within the jet fuel specification groups (primarily ASTM and DEF STAN) have been made to approve new components for jet fuel. The generic approval in September 2009 of Fischer-Tropsch (FT) kerosene produced from natural gas, biomass or coal blended at concentrations of up to 50% in traditional jet fuel marked a major step forward. More recently (in June 2011), the approval of Hydrogenated Esters and Fatty Acids (HEFA) represented a further widening of the envelope of suitable sources and processing routes for producing jet fuel. The HEFA approval is the more significant because it effectively allows supply of bio-derived renewable fuel components in jet fuel, even though the FT approval in September 2009 already permitted fuel components made from biomass. The HEFA approval has enabled airlines to fly on renewable fuels and all recent demonstration and scheduled flights have been conducted with HEFA blends. The ASTM D7566 specification details the approved alternate components. It must be stressed that renewable components used in ground fuels (such as FAME, FAEE, ethanol ETBE, MTBE) are **not** approved for use in aviation fuels. A good example is FAME which is used as a renewable component in biodiesel. FAME is currently limited to a maximum concentration of 5 ppm in jet fuel (see JIG Bulletin 26).

The clear intention of the industry work on alternate fuels is to avoid the need for special handling or modified infrastructure in the fuel supply chain or on aircraft. Although airports and fuelling companies should not need to make any changes to their infrastructure to handle jet fuel with these new components, there are aspects that need to be considered. For example, although many airline operators will be keen to fly specific routes on biojet, most airports (especially large joint venture type airports) will not easily be able to segregate a biojet and supply it to individual aircraft, especially on a routine basis. The European Union (EU) has already recognised this fact for the purposes of the EU Emissions Trading System and the credits for using renewable fuel can be captured from a paper trail rather than trying to measure and track volumes coming from renewable sources throughout the airport fuel system.

Because the Joint Systems Check List represents the most stringent requirements of the ASTM and DEF STAN Jet fuel specifications, JV airports operated to JIG Standards shall follow the DEF STAN 91-91 prohibition of blending the bio-component (meeting ASTM D7566) into finished jet fuel at airports. The blending does not have to happen solely at refineries. Intermediate supply depots and terminals are acceptable but blending shall be completed and the fuel certified before delivery to an airport.

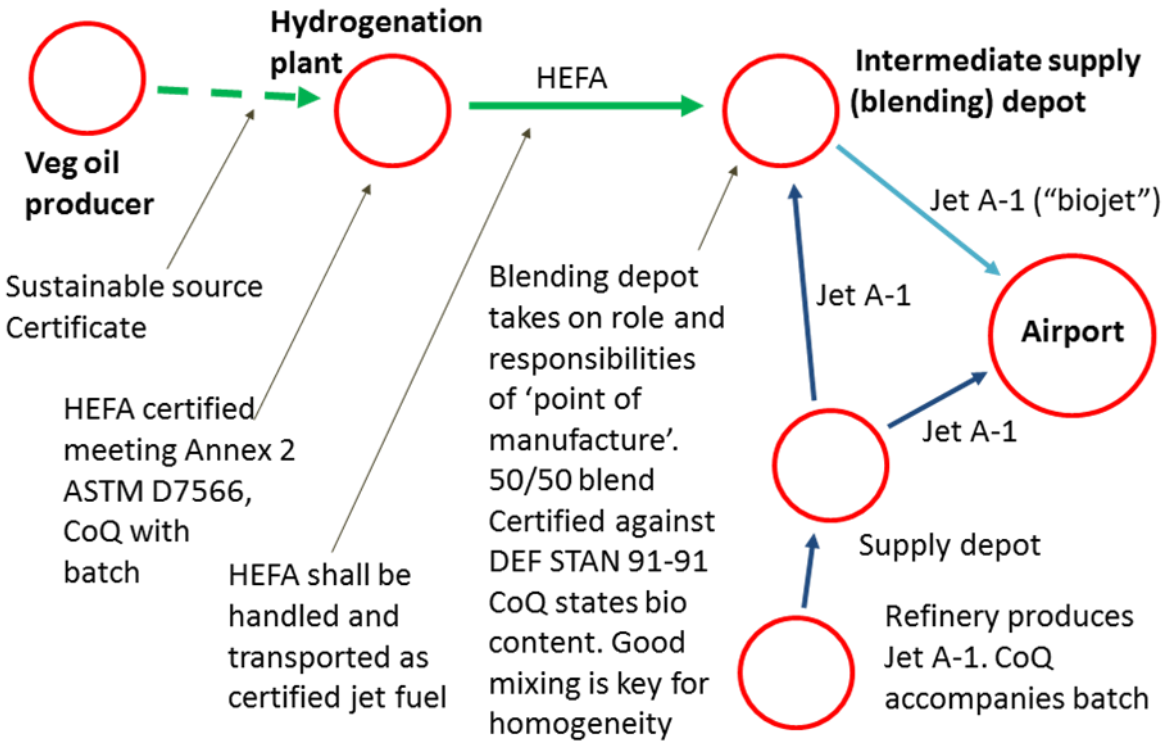

Figure 1 – Quality assurance for blending new fuel components into Jet A-1 (this example shows a hydrogenated vegetable oil). In this example, the blending of the HEFA component with Jet A-1 is shown at an intermediate supply depot. It could also take place at a refinery.