

Summary of Changes made to JIG 4 Issue 3

Section	Description
JIG 4	
Intro	List of useful publications is now included.
2.1	Heading changed to: <i>Health, Safety, Security and Environmental (HSSE) Management</i> Additional new text with some minor changes added to the HSSE introduction. "Material Safety Data Sheets" text change to: <i>shall be available and should be displayed.</i> Mobile phones update: <i>unless intrinsically safe for use in the applicable hazardous area/zone and approval is given</i>
2.3	New paragraph added describing: lessons learned from incident investigations
2.7	New section added: <i>Permit to Work System</i>
2.8	New section added: <i>Management of Change</i>
3.1	Additional text (consistent with JIG 2) added regarding sampling requirements
3.2	Added to first sentence: <i>closed sampling clear glass containers or "visijars" shall be used,</i> and changed should to shall. Also added: <i>Buckets used for flushing shall be manufactured</i> When samples are taken for laboratory testing, suitable containers shall be provided by the laboratory or the fuel supplier. These shall be carefully rinsed with the fuel <i>at least three times</i> before preparing the sample.
3.3	"Running Sample" references throughout document are changed to "Line Sample" – Line sample definition is not changed but "Running Sample" references throughout document are changed to "Line Sample"
3.4 (a)	Refinery Certificate of Quality – revised definition and added the following: <i>in the relevant fuel specification and, for Jet A-1, the requirements of the latest issue of the JIG Aviation Fuel Quality Requirements</i>
3.4 (b)	Certificate of Analysis – revised definition and added the following: <i>included in the relevant fuel specification and, for Jet A-1, the requirements of the latest issue of the JIG Aviation Fuel Quality Requirements</i>
3.4 (e)	Release Certificate – revised definition and added the following: <i>confirming compliance with the relevant fuel specification and, for Jet A-1, the requirements of the JIG Aviation Fuel Quality</i>
3.4.1	"in compliance with the fuel specification and approved by the company" replaces "Accepted for Aviation use" (final sentence)
3.4.2 (a)	COA Testing: This test covers all tests <i>required by the relevant fuel specification and, for Jet A-1,</i> the latest issue of the JIG Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS) Check List
3.4.2 (a)	New text regarding FAME: <i>Unless FAME (Fatty Acid Methyl Ester) can be controlled to limit the exposure in Jet Fuel to less than 5 mg/kg in accordance with JIG Bulletin 75, then in markets and supply chains where FAME is present in multiproduct systems,</i> FAME concentration shall be tested by an approved method, wherever Jet fuel has been transported in multi-product transport systems that also carry gas oil / diesel fuel or non-dedicated storage that may have contained gas oil / diesel fuel.
3.4.2 (b)	Recertification Testing: This test is carried out to verify that the quality of the aviation fuel concerned has not changed and remains within the specification limits after transportation in ocean tankers or multi-product pipelines, etc. ("For example" after "specification limits" is deleted) In para 4,Appendix A8/A9. Acceptable differences are given on the forms. ("for guidance" after ..."are given" is deleted) Amended fourth bullet point to clarify when Certificate of Analysis Testing is required

	instead of Recertification Testing (more than 3 new batches received into a tank)
3.4.2 (b)	Revised note 4: <i>Unless FAME (Fatty Acid Methyl Ester) can be controlled to limit the exposure in Jet Fuel to less than 5 mg/kg in accordance with JIG Bulletin 75, then in markets and supply chains where FAME is present in multiproduct systems, FAME concentration shall be tested by an approved method, wherever Jet fuel has been transported in multi-product transport systems that also carry gas oil / diesel fuel or non-dedicated storage that may have contained gas oil / diesel fuel.</i>
3.4.2 (e)	Commercial brand names removed Reference to IATA recommended types of chemical water detectors
3.4.2 (f)	Control Check - <i>3 kg/m³</i> changed to <i>3.0 kg/m³</i>
3.4.2 (g)	The investigation shall include an assay test for microbiological activity....("on-site" deleted) Reference to IATA list of recommended MBG Test Kits
3.4.2 (g)	New text referring to the JIG Technical Information document on MBG monitoring
3.4.2 (h)	"Chemical Water Detector" replaces "CWD"
3.4.2 (i)	New text added: <i>Table of minimum test requirements</i> <i>The following table summarises the minimum test requirements for all airport operations.</i>
4.2.2	Requirement for aviation fuel tankage to be dedicated and grade segregated. <i>Should</i> changed to <i>shall</i> in four places
4.2.3 (a)	Mesh size 5 mm (0.2 inch) - previously shown as 5 mm (0.25 inch) Reference to flame arrestors added
4.2.3 (b)	In the case of above-ground vertical tanks, drain line should lead to a large capacity stainless steel or internally lined mild steel sample receiving vessel, provided with a self-closing (spring-loaded or equivalent) quick-acting valve at entry <i>and any sampling point upstream a suitable product return system</i>
4.2.3 (f)	Floating suction arms, <i>bonded to the tank shell</i> , with position indicators and/or check cables, also bonded to the tank shell shall be fitted to vertical Jet fuel tanks and large horizontal tanks (greater than 50,000 litre capacity) <i>and are also recommended for Avgas.</i>
4.2.3 (h)	Tanks shall be numbered clearly and marked with grade stored (EI 1542 designation) and, as a minimum, show the date of the most recent internal <i>inspection and cleaning.</i>
4.2.3 (i)	Requirement for PRTs in excess of 1,000 litres capacity to have high level alarm systems. Additional design requirements for PRTs including 1:30 min slope for new builds
4.2.3 (j)	New – Small Product Recovery Tanks (less than 1,000 litres) and all tank-side Quick Flush Tanks shall either be fitted with spring loaded self-closing inlet valves or high-level alarm system(s) as per 4.2.3 (i)
4.2.3 (k)	New – Any tank incorporating a system design that allows automatic and/or uncontrolled receipt of product e.g. from Thermal Relief / Pressure Relief / Air Eliminator systems shall be risk assessed to ensure adequate controls in place to prevent overflow
4.3.2	New requirement for removal of pipework deadlegs (or fitting drain valves) Quarterly draining added
4.4.1	Where it is required to supply Jet fuel containing Fuel System Icing Inhibitor (FSII) filter separators <i>shall</i> be used... <i>and fitted with the correct class of EI 1581 latest edition elements (suitable for use in Jet fuel blended with FSII)</i>
4.4.1	Under "General" the first sentence is changed to: <i>A single filter for both receipt and fueller loading may be used but the preferred option is separate inlet and outlet filter vessels.</i> Second paragraph: For locations where receipts occur less than monthly, a 100 mesh strainer may be used as an alternative <i>to a receipt filter.</i> Increased settling

	times shall be observed <i>and delivery/fueller loading shall be via a filter vessel meeting the above requirements for Jet Fuel and Avgas.</i>
5.3	Additional text added to second paragraph: <i>The receipt location shall ensure that their suppliers provide documentation, including cleaning certification, for all grade changes.</i> Fifth paragraph deleted.
5.3.1	Receipt by truck/railcar – reference to grade markings and safe working at height added (for checking seals etc.)
5.3.2	<i>Appearance Check</i> replaces <i>Visual Check</i> . Reference to water in substantial quantities after settling changed from 2 to 1 litre <i>Should</i> changed to <i>shall</i> in two places
5.3.3	Control Check – <i>3 kg/m³</i> changed to <i>3.0 kg/m³</i> (in two places) Clarification that the Appearance Check is required for each compartment sample
5.3.5	After discharge the compartments <i>shall</i> (was <i>should</i>) be checked to ensure that they are empty. <i>The preferred method is to check each compartment drain point for product.</i>
5.3.7	Requirement for drivers to take a 2.5 litre sample at each batch change for retention at the receiving location is removed (was second bullet point) Control Check – <i>3 kg/m³</i> changed to <i>3.0 kg/m³</i> (in two places) Reference to <i>calculated</i> expected value in penultimate paragraph.
5.4.1	Added a sentence concerning information/control of the settling period.
5.5	Reference to giving a batch number to product in tank before release
6.1.1	Storage tank <i>and Product Recovery Tank</i> sumps/low points shall be checked daily for the presence of water and sediment <i>Line sample</i> replaces "running sample"
6.1.2	Draining of filter vessels at locations which are not manned every day.
6.1.6	An additional sentence added. <i>Samples should also be taken for Periodic Test from each tank in which less than half of the product has been replaced during a 6-month period.</i>
6.2.1	Clarification and updated tank inspection and cleaning requirements.
7.1.2	For existing vessels, element conversions <i>shall</i> meet, by test or similarity, the latest edition of EI 1581 requirements. (reference to installing elements meeting the latest issue of EI 1581 within 5 years of publication is deleted). Where it is required to supply Jet fuel containing Fuel System Icing Inhibitor (FSII) filter separators <i>shall</i> be used... <i>and fitted with the correct class of EI 1581 latest edition elements (suitable for use in Jet fuel blended with FSII)</i>
7.1.3	<i>or type F where needed or in specific applications.</i> Typical hose applications and hose construction types added to the text.
7.1.6	Clear description of overwing nozzles for Avgas and for Jet Fuel Revised text to explain interlock requirements for overwing nozzle stowage
7.1.7	Clarification – a second in-line pressure control valve is required if maximum flow rate is more than 1,000 litres/min per delivery hose
7.1.8	<i>BC dry powder</i> changed to <i>suitable (BC or ABC) chemical dry powder</i> extinguishers
7.2	Section heading changed from <i>Fuellers</i> to <i>Fuelling Vehicles</i>
7.2.1	Diesel changed to <i>diesel engines</i>
7.2.3	Interlocks required on <i>all motorised self-propelled fuelling vehicles</i> (replaces <i>all fuelling vehicles</i>) Releasing the handbrake shall not cause interlocked tank-top handrails to be lowered or other interlocked components to be deactivated. Ref to EN 12312 added and should be fitted to vehicle bonding cable clip stowage. Interlocks should not be fitted to vehicle seats. Vehicles should also be fitted with a device that either warns the operator to ensure that the brakes are engaged, or a device that automatically engages the brakes,

	<p>when leaving the vehicle cab. Such devices shall only be installed provided they can be tested safely.</p> <p>Warning Lights: shall be fitted in a prominent position in the vehicle cab and <i>emitted light clearly visible to the driver when seated in the normal driving position</i>.</p>
7.2.4	<p>Clarification that an Emergency Shut Down button is required on each side of the fuelling vehicle.</p> <p>A separate fuel emergency shut-down button shall be fitted where the cargo pump is powered by a separate power source.</p>
7.2.5	<p>Deadman opening time description amended to refer to 3 seconds. (was 5 seconds)</p> <p>Revised text on the use of cordless deadman types and Operator responsibility: <i>Where cordless deadman systems are in use the operator is required to remain within 20M of the fuelling vehicle during cordless deadman operation. Any movement outside of this zone or line of sight within this zone requires the operator to release the deadman and stop fuel flow.</i></p>
7.2.6	<p>New requirements for fueller delivery pipework for new builds (from Jan 2014) and modification of existing equipment</p>
7.2.8	<p>Reference to "self-closing" (spring loaded) valve added</p>
7.2.10	<p>Clarification of overfill protection requirements</p>
7.2.14	<p>Elevating fuelling platform design requirements revised to clarify requirements for raising/lowering, non-slip flooring, secured access gate and warning labels</p>
7.4	<p>New section detailing the design requirements for aircraft fuelling steps and towable fuelling platforms</p>
8.1	<p>Sentence added: <i>Standing water shall be drained from bunds without delay</i></p>
8.2.3	<p>New paragraph including towable platforms and mobile fuelling steps</p>
8.3	<p>Text added: <i>Procedures shall ensure that fuel used for meter calibration is returned to a storage tank of the same fuel grade.</i></p> <p>Reference to HM 20 added.</p>
8.4	<p>Paragraph added: <i>Non-critical gauges should be identified as "for information only" and calibration dates should be shown on critical gauges</i></p>
8.6.1	<p>(Grade 2) added to EI 1529 Reference to EN 1361 deleted</p> <p>Revised text regarding operating pressure limits for BS 3492</p> <p>Type C pressure hose is not to be used for discharge from bridgers/railcars – suction hoses are required</p>
8.6.2	<p>New paragraph with storage and service life for depot hoses</p>
8.6.3	<p>Revised text for soaking and flushing of new fueller loading</p>
8.7.3	<p>In the last paragraph <i>shall</i> replaces <i>should</i>. Check of Resistance Temperature Devices (RTDs) added.</p>
8.8	<p><i>Should</i> changed to <i>shall</i> in four places</p> <p><i>Permanently pressurised extinguishers should be fitted with a pressure gauge</i></p>
8.9	<p>Clarification – <i>All Electrical equipment, both fixed and portable, and wiring shall be of a suitable type for the Hazardous Area of Classification in which it is used and shall be checked and maintained by a trained and competent person(s).</i></p> <p>Two new paragraphs added: Testing requirement for Emergency shut-down systems and deadman systems.</p>
8.12	<p>Title is now <i>Interlocks and Emergency Engine/Fuelling Stops</i></p> <p>Daily check of <i>different interlocked components in rotation and interlock warning light</i></p> <p>Action to take in the event of a faulty interlock is added</p> <p>Monthly testing of Emergency Engine/Fuelling Stop</p>
8.14	<p>An annual check to confirm the setting of the intermittent timer and a quarterly check of the cordless deadman systems if used has been added.</p>
8.15.1	<p>Records of hoses <i>and flexible joints</i></p>

8.15.2	Maximum life for hoses <i>and flexible joints</i> is 10 years. Reference to hose life extension beyond 10 years deleted Reference to EI 1540 section 7.2.9 added – storage of new fuelling vehicle hoses
8.15.3	Product used for soaking hoses, before flushing, shall be downgraded Clarified procedure for checking the product used for flushing new hoses.
8.15.4	Reference to the inspection and testing of pressure hoses on refuelling steps added
8.15.5	Reference to possible need to adjust venturi after shortening hoses
8.16	Fuelling couplings to be maintained in accordance with manufacturers' requirements
8.19 (a)	Visual inspection from hatches applies to Jet fueller tanks and not AVGAS Reference to top loaded fuelling equipment deleted Reference to confined space entry (for cleaning or repair) and safety precautions added to second paragraph A new third paragraph added for Avgas fuellers Reference to working at height, when on top of fuellers, added to fourth paragraph
8.19 (b)	Reference to fueller tank cleaning without entry is added Routine tank entry and cleaning every 5 years deleted and Appendix 14 amended
8.20	New section: <i>Product recovery tanks (vehicle sample tanks / stand-alone trailers)</i>
8.22	Function test requirements for overfill protection devices have been added.
8.24	New section requiring daily visual check and 6-monthly serviceability check of aircraft fuelling steps and towable platforms. Checks added to appendix A14
8.25	New section – equipment calibration – reference to new appendix A13
8.26	New section - <i>Where installed on bridger receipt or fueller loading facilities the deadman control shall be performance tested at least monthly.</i> Added to Appendix A14
9.1.1	Revised section on fueller loading requirements including bonding and overfill protection. When filling from the hydrant, fuellers shall not be bonded to the hydrant pit. Fuellers shall not have the engine running during loading operations. If a cordless deadman control is used, <i>it shall be released if the operator is more than 10 metres from the loading point, or is out of the line of sight of the loading point.</i>
9.1.2	Updated section clarifying the requirements for overfill protection and updated hose specifications (removal of ref to EN 1361) and clarification of pressure limitations of BS3492.
9.1.3	Settling time after fueller loading before taking a sample for Visual Check is <i>at least 10 minutes</i> (was at least 5 minutes) <i>Vehicles may be moved from the loading area to a designated parking area for settling after loading before sampling</i> (new text)
9.2.4	Procedures for recovery of aviation fuel samples include requirement for daily removal of water and sediment
10.3.1	Section re-named <i>Driving and Approach to Aircraft</i> Vehicle brakes shall be safely tested when leaving the <i>vehicle parking stand and on approach to aircraft parking stand (15m from Stand)</i>
10.3.2	Clarification: Fueller and (<i>drawbar</i>) trailer combinations shall not be reversed.
10.4	Bonding requirements specified for the use of aircraft fuelling steps and towable fuelling platforms to fuel aircraft Best practice for overwing fuelling – first bullet point (“equalise electrical potential by touching the nozzle to the metal wing surface”) is deleted
10.5.1	Reference to the need for a procedure for suspension of fuelling operations in the event of an electrical storm
10.5.2(a)	Actions and investigation process to be followed if a dP switch is activated during fuelling operation
10.5.2(b)	Frequent observation of aircraft vents to be carried out by the fuelling operator

10.5.2(g)	the operator shall make a final check, including a complete "360 degree" walk around the vehicle (shall replaces should)
10.5.3	Manual valve now referred to as manual <i>delivery</i> valve
10.5.4(a)	Revised section on overwing fuelling including the requirement for 2 controls out of 3 to be in place before fuelling and reference to a revised grade confirmation form (A6) <u>New sections</u> self-service fuellings 10.5.4 (c) and unattended fuellings 10.5.4 (d)
10.6	Fuelling/Defuelling with passengers on board – updated requirements
10.7	<i>Shall</i> replaces <i>should</i> in four places (sections 10.7.1 and 10.7.2) Section 10.7.3 (APU in engine nacelle on fuelling side of aircraft) updated Minor change to fuelling zone definition in footnote
10.11	Helicopter Fuelling section with updated procedures and new requirements.
10.12	Revised procedures for fuelling in hangars
10.13	New section – Maintenance to aircraft landing gear is not permitted under any circumstances during fuelling
11.1.4	New: Product deliveries and transfers including date/time when tanks put in service
11.2.7	New: Emergency/Engine Stops
11.3	Product quality documents to be retained for 7 years (previously 10 year minimum)
A1.1	Para 1 – reference to "self-closing" valves added Para 3 – Air eliminators and pressure relief valves shall (was <i>should</i>) be maintained in accordance with manufacturer's recommendations <i>and at least annually</i> (annual requirement is new – added to A14) Para 6 – The maximum achievable flow rate through each filter vessel in <i>fuelling</i> service <i>shall...</i> (was <i>should</i>)... Maximum achievable flow rate shall be marked on the vessel <i>or a suitable area close to the vessel...</i> <i>All Filter Water Separators shall have similarity certificates in accordance with EI 1582 confirming compliance of the installed elements and vessel to EI 1581 (new requirement)</i>
A1.2.2	Maximum <i>achievable</i> (replaces maximum operating) flow rate
A1.3.1	Maximum <i>achievable</i> (replaces maximum operating) flow rate (in two places)
A1.3.2	Maximum <i>achievable</i> (replaces maximum operating) flow rate (in two places)
A1.3.3	Revised footnote about elements being wet with aviation fuel for testing
A1.3.4	Maximum <i>achievable</i> (replaces maximum operating) flow rate (in two places) Maximum of 1 year life for monitors (replaces reference to manufacturer recommended service life)
A2	Form re-titled as Tank <i>inspection and</i> cleaning form
A3	A3.1.1 – revised text refers to normal operating pressure (deleted reference to full pump/maximum pressure) <u>A3.1.2 – Monthly Hose Inspection (revised note)</u> <u>Note: It is not necessary to remove wheel fittings and hose protection beads. However, spiral wraps shall be removed before testing or moved during the test so the full length of the hose is inspected.</u> <u>A3.2.2 – 6-Monthly Hose Pressure Test (new note)</u> <u>Hose beads and spiral wraps shall be removed before testing. Wheel fittings should be removed or loosened (**) for each pressure test. As a minimum they shall be removed or loosened (**) for the test at least every two years.</u> <u>(**) Where wheel fittings are loosened (but not removed from the hose) they shall be moved so that the whole length of the hose can be inspected. Wheel fittings shall be returned to their original position at the conclusion of the test.</u>
A3.4	New section – six monthly visual check of flexible joints (check added to A14)

A5	"Y" = expected (was mandatory)
A6	New Grade Confirmation Form
A7	Reference to EI 1560, 1585 and 1594 added.
A7.1	<p><u>Revised text:</u> Where Jet fuel hydrant servicers are equipped with filter separators <i>they should be fitted with a FWS water detection device in the sump. They should have the capability of being function tested externally in accordance with manufacturer's requirements.</i></p> <p>dP switches (linked in series to the deadman) are mandated for filter monitors on hydrant servicers</p> <p>Testing requirements for dP switches attached to filtration dP gauges</p> <p>New – Action and investigations following f a filter monitor dP Switch Activation.</p> <p>Sampling: Clarified hydrant servicer sampling procedure requiring two samples at each fuelling operation. At least one sample shall be checked with a chemical water detector</p>
A7.2	<p>Meter delivery valve now referred to as delivery valve (in three places)</p> <p>Disconnection sequence – pulling lanyard to close pit valve (<i>May not be required for airports which only have Dual Air/lanyard operated systems</i>)</p> <p>"airline" changed to "air line" in three places</p> <p>Note: If the sequence of connection and disconnection is broken due to distraction the operator shall begin the sequence again <i>from the start.</i></p> <p>New text added: <i>Hydrant Servicers would not normally be driven away in the event of an emergency during fuelling.</i></p> <p>New text added: <i>Extend lanyard on the apron such that it is free of obstructions and readily accessible for use in an emergency.</i></p>
A7.3	<p>Area around hydrant pit covers to be marked as a warning to ramp user – new text</p> <p>New text covering the requirements around EI 1584 third edition hydrant valves and inlet couplers. Including annual wear check using the appropriate wear gauges.</p>
A7.4	<p>Lanyard colour and minimum length of 5 metres – new text consistent with EI 1540</p> <p>Electrical isolation of lanyard reels from vehicle chassis – <i>should</i> changed to <i>shall</i></p>
A7.5.1	"Running sample" changed to <i>line sample during flow.</i>
A7.5.2	New – Requirement and guidance for Hydrant Operator investigations following the notification of a fuelling vehicle being removed from service during fuelling as a result of a filter monitor dP Switch Activation or discovery of water/contamination.
A7.5.4	Requirement for pit flushing vehicles to be fitted with interlock systems – weekly function check
A7.6	<p>Heading changed to <i>Hydrant Pits and Pit Valves</i></p> <p>Revised text regarding monthly and annual checks</p> <p>New: <i>Annual wear check of API adaptor shall be carried out using the manufacturer's approved gauge.</i></p>
A7.7	New text about fuelling from a stand or section of hydrant where the ESB (fuel hydrant emergency shut-down) system is inoperative.
A7.9.1	Revised text regarding use of mobile leak detection equipment for 6-monthly checks of hydrants without tightness control systems (consistent with EI 1560)
A7.9.2	<p>Reference changed from API 570 to <i>API 570 and API 2611</i></p> <p>Reference to EI 1560 section 10.2.3 added for further details of testing</p>
A7.10	<p>Opening paragraph – "There shall also be a planned maintenance system....." (shall replaces should)</p> <p>Heading changed to <i>Lanyard operated valves</i></p> <p>Heading changed to <i>Dual Air operated valves</i></p> <p>Note (1) in first paragraph deleted – reference was to equipment which is now obsolete</p> <p>Reference to using a wristwatch at the end of first paragraph is deleted</p>

A8	<p>Form for Avgas Recertification (“an example of a” removed from title)</p> <p>Correction – “Quantity Received” (not quality)</p> <p>Initial Boiling Point and acceptable difference added</p> <p>Distillation – some changes to acceptable differences</p>
A9	<p>Form for Jet A-1 Recertification (“an example of a” removed from title)</p> <p>Correction – “Quantity Received” (not quality)</p> <p>Saybolt Colour – ref to Def Stan 91/91 Annex E added to the acceptable differences</p> <p>Initial Boiling Point added</p> <p>FAME content – 50 max, two new IP test methods and reference to JIG Bulletin 75</p> <p>MSEP reference to JIG Bulletin 65</p>
A11.3.1	Corrected title of EI 1541
A11.3.1	<p>Soak Testing – Vehicle pipework – clarification</p> <p>All product <i>used for soaking and</i> flushed through a hydrant servicer into storage, or circulated through a fueller, shall be quarantined awaiting the laboratory test results.</p> <p>Soak Testing – Hoses</p> <p>Clarification of soaking requirements for new hoses</p>
A11.3.2	Storage tanks – reference to requirements for unlined/partially lined tanks deleted
A11.5	Soak test requirements table amended to remove reference to unlined tanks and show sample volume required (4 litres)
A13	New appendix – equipment calibration programme
A14	Updated table of frequencies of routine tests