Summary of Changes made to Issue 11

JIG 1	Description of changes to JIG 1
Intro	Updated glossary of terms, table of acronyms, list of useful publications and acknowledgements
	Removal of references to JVs and participant approvals throughout document. JIG JV/JIG inspected location requirements moved to new appendix A17
1.1	Purpose – part of this section and other parts of Chapter 1 moved to new appendix A17
1.2 (b)	Scope amended to refer to EI/JIG 1530 instead of JIG 3
1.3	Application section amended to remove references to JVs and participants. In paragraph 2, deleted "other" to clarify that AFQRJOS is not a specification
1.4	Updated inspection and variance approval requirements
2.2	Reference to colour blindness and ability to visually assess fuel colours previously included in Chapter 8 (8.6.3) *ASTM International* replaces "American Society for Testing and Materials"
2.2.1 (a)	Revised text refers to *appropriate drain point*
2.2.2	"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"
2.2.3 (a)	Clarification of need to rinse laboratory sample containers before use
2.2.3 (b)	Reference to closed sampling systems added. *Should* changed to *shall* and clarification that the use of buckets is in addition to glass sampling jars
2.3.1 (b)	Reference to EI/JIG 1530 added – for guidance on approved laboratories
2.3.2	Certificate of Analysis – revised definition: *contains the results of measurements made of all the properties included in the relevant fuel specification and, for Jet A-1, the requirements of the latest issue of the JIG Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS) Check List*
2.3.3 (a)	Revised minimum sample quantities for testing Avgas - *25 litres (COA) and 4 litres (Recertification)* The Certificate of Analysis - covers all tests required by *the relevant fuel specification and, for Jet A-1, the requirements of the JIG AFQRJOS Checklist*
2.3.3 (c)	Commercial brand names removed Reference to IATA recommended types of chemical water detectors
2.3.3 (d)	Control Check - *3 kg/m3* changed to *3.0 kg/m3*
2.3.3 (e)	"colour" changed to "colorimetric" in final paragraph
2.3.3 (f)	Reference to brand names of conductivity meters is deleted
2.3.3 (g)	The investigation shall include an assay test for microbiological activity….("on-site" deleted) Reference to IATA list of recommended MBG Test Kits
2.3.3 (g)	Text referring to the JIG Technical Information document on MBG monitoring
2.3.3 (h)	"Chemical Water Detector" replaces "CWD" The table from 2.3.3 (h) is moved to 2.3.3 (i) – *minimum test requirements*
3.1.1	"diesel" changed to "diesel engines"
3.1.4 (a)	For existing vessels, element conversions *shall* 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).
3.1.4 (c)	First paragraph deleted
3.1.4 (c)	Revised text: Where Jet fuel hydrant servicers are equipped with filter separators *they should be fitted with a FWS water detection device in the sump. These devices should also be considered for fitting to FWS vessels on fuellers.* *They should have the capability of being function tested externally in accordance with manufacturer's requirements.*
3.1.4 (c)	dP switches (linked in series to the deadman) are mandated for filter monitors on hydrant

	servicers (see 4.10.3 for testing requirements)
3.1.5	Typical hose applications and hose construction types added to text and a table inserted
3.1.5	Revised text referring to the use of Coupler Lift Assist Devices
3.1.7 (a)	Interlocks required on *all motorised self-propelled fuelling vehicles* (replaces *all pressure fuelling vehicles*) 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 Interlocks shall be fitted to fueller loading connections and *should be fitted to vehicle bonding cable clip stowage.* *Interlocks should not be fitted to vehicle seats*. The electrical circuitry *should be* designed so that the brake lights switch off when the vehicle parking brake is applied. *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, when leaving the vehicle cab. Such devices shall only be installed provided they can be tested safely.*
3.1.7 (c)	Interlock warning lights to be fitted in a prominent position in the vehicle cab and *the emitted light shall be clearly visible to the driver when seated in the normal driving position*.
3.1.8	Clear description of overwing nozzles for Avgas and for Jet Fuel Revised text to explain interlock requirements for overwing nozzle stowage
3.1.9 (b)	Clarification – In-line pressure control valve (2) required for vehicles with *flow rates of more than 1,000 litres/min per delivery hose*
3.1.10	*BC dry powder* changed to *suitable (BC or ABC) chemical dry powder* extinguishers
3.1.12	Clarification that an Emergency Shut Down button is required on each side of the fuelling equipment in accordance with EN 12312-5 The engine stop should also stop the fuel flow
3.1.13(a)	Deadman opening time description amended to refer to 3 seconds if maximum flow rate is less than 2,000 litre/min – this is now consistent with A15.7
3.1.13(a)	On all new pressure fuelling vehicles the deadman control system shall be designed to require periodic action by the operator within a predetermined time interval (not exceeding 2 minutes) to prevent automatic close-down. This “timer” (intermittent) deadman *should be incorporated into the design of existing vehicles*.
3.1.13(a)	Revised text on the use of cordless deadman types and Operator responsibility: *Where cordless deadman systems are in use the operator is required to remain within 20 metres and line of sight of the fueling vehicle during cordless deadman operation. In the case of any movement outside of this zone or line of sight within this zone the operator shall release the deadman and stop fuel flow.*
3.1.14	JIG Bulletin 66 requirements for fueller delivery pipework for new builds (from Jan 2014) and modification of existing equipment
3.1.16	Elevating fuelling platform design requirements revised to clarify requirements for raising/lowering, non-slip flooring, secured access gate and warning labels. 2 wand sensors is a requirement since January 2013
3.2.2	Reference to “self-closing” (spring loaded) valve added
3.2.4	Clarification of overfill protection requirements
3.3.2	Lanyard colour and minimum length of 5 metres – new text consistent with EI 1540 Electrical isolation of lanyard reels from vehicle chassis – *should* changes to *shall*
3.4	New section detailing the design requirements for aircraft fuelling steps and towable fuelling platforms
4.4	Title is now Interlock system *and Emergency Engine Stops* Daily check of *different interlocked components in rotation* and *interlock warning light* Action to take in the event of a faulty interlock is added Monthly testing of Emergency Engine/Fuelling Stop (added to A1)
4.5	New: Bonding wire continuity test for towable platforms and mobile fuelling steps with integral

	hoses.
4.7.1	Deletion of 20 Metre range from quarterly test of cordless deadman
4.8.1	Records of hoses *and flexible joints*
4.8.2	Maximum life for hoses *and flexible joints* 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
4.8.3	Product used for soaking hoses, before flushing, shall be downgraded Clarified procedure for checking the product used for flushing new hoses including the inspection of hose-end strainers after hose flushing
4.8.4	Reference to the inspection and testing of pressure hoses on refuelling steps added to 4.8.4 (and 4.8.6 is deleted)
4.9.1	Reference to local legislation removed from opening paragraph. *The capacity of a volumetric proving tank shall not be less than the volume delivered by the meter under test (MUT) in one minute at maximum design flow rate and shall be of sufficient capacity to meet the requirements in HM20* (replaces reference to minimum 5,000 litre capacity) *Master meters that are mobile and service more than one installation should be recalibrated annually or after 15 million litres have passed through them.* *Procedures shall ensure that fuel used for meter calibration is returned to a storage tank of the same fuel grade* – text added after third paragraph Reference to meter calibration being carried out in accordance with HM 20 (meter proving) added to penultimate paragraph: *Meter proving shall be carried out in accordance with HM 20 and the EI Petroleum Measurement Manual, the API Manual of Petroleum Measurement Standards or equivalent industry standard.*
4.9.2	Requirement to verify that third party contractor procedures meet a □ recognized standard as well as JIG requirements in 4.9.1.
4.10.1	Reference to *filter differential pressure gauges* is deleted. Calibration is not required for dP piston type gauges. The required free movement test is covered in 4.10.3
4.10.2	Current calibration certificates for master gauges to be available
4.10.3	Testing requirements for dP switches attached to filtration dP gauges (added to A1)
4.12	Fuelling couplings to be maintained in accordance with manufacturers' requirements
4.13	Overwing nozzles – *records of repairs and adjustments shall be maintained*.
4.14.1	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 Reference to working at height, when on top of fuellers, added to third paragraph
4.14.2	Reference to fueller tank cleaning without entry is added Routine tank entry and cleaning every 5 years deleted and Appendix 1 amended
4.19.1	Third para: The accuracy of all in-service instruments *shall be* checked at least once every 6 months against reference instruments meeting the above standards or in accordance with the other options given in 4.19.4. Resistance temperature devices (RTDs) shall be checked *6-monthly* against a reference thermometer. A1 updated to show RTD *6 months check* (was monthly)
4.19.4	*Shall* replaces *should* in first paragraph These checks *should* be …..(*should* replaces *may*)
4.20	*Should* changes to *shall* in four places *Permanently pressurised extinguishers should be fitted with a pressure gauge* Reference to 6 monthly testing for powder caking no longer required (unless specified by manufacturer) – removed from Appendix 1.
4.21	Clarification – *All Electrical equipment, both fixed and portable, and wiring shall be of a suitable type for the Hazardous Area in which it is used and shall be checked and maintained.*

4.22	Conductivity meters *shall be* calibrated at least every 3 years Continuity meters shall be calibrated in accordance with the manufacturer's requirements Torque wrenches shall be calibrated in ft-lbs or Nm in a range including 0-50 ft-lbs / 0-68 Nm. Torque wrenches may also be required in a wider range to accommodate other applications
4.23	New section to include testing requirements for designated defueling vehicles with double valve separation in the delivery pipework 6 monthly test added to A1
4.24	New section requiring daily visual check and quarterly serviceability check of aircraft fuelling steps and towable platforms. Checks added to appendix A1
4.25	New section – equipment calibration – reference to new appendix A16
5.2.3	Procedures for recovery of aviation fuel include requirement for daily removal of water and sediment
5.3.1	Fueller sampling for small volume uplifts (where fueller pipework & filter volume is not displaced) to be taken after fuelling
5.3.2	Clarified hydrant servicer sampling procedure requiring two samples at each fuelling operation. At least one sample shall be checked with a chemical water detector
5.3.3	*Where required*, *retained* samples should be suitably labelled and retained for *at least* 24 hours
5.8.1	Revised section on fueller loading requirements including bonding and overfill protection. *If a cordless deadman control is used, it shall be released if the operator is more than 10 meters from the loading point, or is out of line of sight of the loading point*. When filling from the hydrant, fuellers shall not be bonded to the hydrant pit. Fuellers shall not have the engine running during loading operations. Final paragraph – updated hose specifications (removal of ref to EN 1361) and clarification of pressure limitations of BS3492.
5.8.2	Settling time after fueller loading before taking a sample for Visual Check is *at least 10 minutes* (was at least 5 minutes) *Vehicles may be moved from the loading area to a designated parking area for settling after loading before sampling* (new text)
5.9	Reference in 5.9 is to *2.3.3 (g)* (was shown as 2.3.4 (f)) Commercial brand names of test kits deleted
6.2.1	Section re-named Driving *and Approach to Aircraft* Vehicle brakes shall be safely tested when leaving the *vehicle* parking stand *and on approach to aircraft parking stand (15m from Stand)*
6.2.3	Clarification: Fueller and *(drawbar)* trailer combinations shall not be reversed.
6.2.3 (b)	Hydrant Servicers would not normally be driven away in the event of an emergency during fuelling. (Issue 11 stated that servicers *shall not be* driven away.....)
6.4	Bonding requirements specified for the use of aircraft fuelling steps and towable fuelling platforms (see 3.4) 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
6.5.1 (a)	Reference to the need for a procedure for suspension of fuelling operations in the event of an electrical storm
6.5.1 (f)	Actions and investigation process to be followed if a dP switch is activated during fuelling operation
6.5.1 (g)	Frequent observation of aircraft vents to be carried out by the fuelling operator
6.5.1 (n)	the operator *shall* make a final check, including a complete "360 degree" walk around the vehicle (shall replaces should)
6.5.2 (c)	*preferred* is deleted from here and from title of A9
6.5.2 (d)	New text added as (d) *Extend lanyard on the apron such that it is free of obstructions and readily accessible for use in an emergency.*

	Sections previously shown as 6.5.2 (d), (e) and (f) now become (e), (f) and (g)
6.5.3	Manual valve now referred to as manual *delivery* valve
6.5.5	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 (A10) New sections – self-service fuellings (6.5.5 (c)) and unattended fuellings (6.5.5 (d))
6.6	References to joint use fuelling equipment and participant approval are deleted
6.6 (a)	Airline to drain aircraft tanks and fuelling operator to take or witness the taking of aircraft tank samples for Visual Check to establish quality of fuel before defueling
6.6 (d)	Second bullet point – "Shall" replaces "should" in two places
6.7	Fuelling/Defuelling with passengers on board – updated requirements
6.8	*Shall* replaces *should* in four places (sections 6.8.1 and 6.8.2) Minor changes to 6.8.1 (a) and 6.8.2 (b) Section 6.8.3 (APU in engine nacelle on fuelling side of aircraft) updated Minor change to fuelling zone definition in footnote
6.11.1 (k)	Note: Under no circumstances *shall* fuelling take place on the same side of the aircraft as that where an engine is running. (shall replaces *may*)
6.12	Revised procedures for fuelling/defueling in hangars
6.14	Bomb Warning on Aircraft – Section Deleted
6.14	New section – Maintenance to aircraft landing gear is not permitted under any circumstances during fuelling/defuelling
6.15	New section – temporary procedures for fuelling when Fuel Hydrant Emergency Stop System is inoperative
6.16	Aircraft incidents/accidents – text removed from Chapter 8 (8.10.5) and updated
7.2	Deadman control moved from 7.2.3 to 7.2.5 Engine stops added as 7.2.4 and Equipment Calibration Programme added as 7.2.15
7.4	Reference to weekly computer back-up moved to first para of Chapter 7
7.5	Laboratory certificates to be retained for 7 years (previously 10 year minimum) Reference to Millipores changed to Filter Membrane Test records
7.5	Document retention – reference to year 2012 deleted.
Chapter 8	Reference to JIG HSSE MS Standard replaces current text
A1	Updated table of frequencies of routine tests
A2	New Variance Approval Certificate form
A3	"Y" = expected (was mandatory) Reference to using variance approval process to amend PPE requirements is deleted
A4	Reference to HSSE-MS Standard added
A5.3.1	Corrected title of EI 1541
A5.3.1	Soak Testing – Vehicle pipework – clarification All product *used for soaking and* flushed through a hydrant servicer into storage, or circulated through a fueller, shall be quarantined awaiting the laboratory test results. Soak Testing – Hoses Clarification of soaking requirements for new flexible vehicle hoses
A5.4	Soak test requirements table amended – sample volume required (4 litres)
A6.1	Para 1 – reference to "self closing" valves added Para 3 – Air eliminators and pressure relief valves shall (was *should*) be maintained in accordance with manufacturer's recommendations *and at least annually* (annual requirement is new – added to A1) Para 5 – The maximum achievable flow rate through each filter vessel in *fuelling* service *shall*...(was *should*)... Maximum achievable flow rate shall be marked on the vessel *or a suitable area close to the vessel*.... *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)
A6.2.2	Maximum *achievable* (replaces maximum operating) flow rate
A6.2.3	Clarification: *Samples for filter membrane testing shall be taken from the downstream side of the filter*.
A6.3.1	Reference to filter membrane test corrected to 2.3.3 (c) Maximum *achievable* (replaces maximum operating) flow rate (in two places)
A6.3.2	Reference to filter membrane test corrected to 2.3.3 (c) Maximum *achievable* (replaces maximum operating) flow rate (in two places) Maximum of 3 years life for coalescers (was 2 years with extended life by unanimous agreement)
A6.3.3	Revised footnote about elements being wet with aviation fuel for testing
A6.3.4	Reference to filter membrane test corrected to 2.3.3 (c) Maximum *achievable* (replaces maximum operating) flow rate (in two places) Maximum of 1 year life for monitors (replaces reference to manufacturer recommended service life)
A6.5	Other strainers (*e.g. pump protection*) *shall* be checked annually for cleanliness and damage to the strainer mesh. (was "should")
A6.7	Corrected description of test method ASTM D2276
A6.7	Filter Membrane testing is normally performed via a test rig but may also be performed during fuelling. (Para 2 from 6.7.3 (Gravimetric Test) moved to section 6.7 to apply to all filter membrane testing) Test rig examples are shown as figure 15.1 or 15.2
A7	*Should* changes to *shall* in first para Microfilter elements added to table
A8	*Should* changes to *shall* in first para
A9	Hydrant Connection and Disconnection Sequences – *Preferred* deleted from heading *Meter* delivery valve now referred to as delivery valve (in three places) Reference to *pit valve adaptor* cap and *extending lanyard on the apron* added to connection sequences. *Airline representative* replaces *A/C engineer/pilot* Disconnection sequence – pulling lanyard to close pit valve (*May not be required for airports which only have Dual Air/lanyard operated systems*) "airline" changed to "air line" in three places Note: If the sequence of connection and disconnection is broken due to distraction the operator shall begin the sequence again *from the start*.
A10	New Grade Confirmation Form
A11	IATA service level 2 ("documented" deleted from A (1) *Obtain total fuel figure from airline representative before fuelling* Level 1 – B - reference changed from authorised *refueller* to authorised *operator* Level 3 item (7) - reference changed to *authorised airline operator*
A12	Jet Fuel Request Form for Defuelling – new form replacing the *Jet Fuel Acceptance Checklist*
A13	"Specification" removed from the title of A13 A13.1.1 – revised text refers to normal operating pressure (deleted reference to full pump/maximum pressure) A13.1.2 – Monthly Hose Inspection reference to *long delivery hoses* for inspection by forming vertical loop Revised 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*. A13.2.1 – deleted reference to pressure testing after accidental damage to hose (see A13.3) A13.2.2 – 6-Monthly Hose Pressure Test …..*designed to accept the test pressure* …(replaces *stressed* to accept test pressure) New Note: *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. *(**) 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.* A13.3 – deleted reference to pressure testing damaged hoses. Reference to section 4.8.5 (re-attaching couplings) added Fig A13.4 – revised description of equipment for hose-end strainer checks
A13.5	New section – six-monthly visual check of flexible joints (check to be added to A1)
A15.4	Para 2 – revised text *Test rigs shall be designed to ensure that all testing shall be performed with operators at ground level while fuel is flowing and not on the vehicle fuelling platform* Para 4 (preparation for pressure control system testing) Note 1 – requirement to break seal/Unlock before raising the air reference pressure added Note 4 amended as follows: *The test pressure should be at least 4.8 bar (70psi) for an optimum test of the various pressure control systems. Where 4.8 bar (70psi) cannot be achieved then the site shall investigate before continuing with the test. Where the investigation confirms 4.8 bar (70 psi) can never be achieved then the maximum achievable pressure shall be recorded and the test performed.*
A15.5	HEPCV Test Procedure – addition to first para: *Before increasing the air reference pressure the value shall be recorded for resetting after the test.*
A15.6	ILCV Test Procedure – revised first para (ref to "normal value" deleted): *Air reference pressure shall be reset to the value recorded before HEPCV test (see 15.4) for this test.*
A15.7	Removal of reference to wireless function range from the testing of cordless deadman Testing of 2 minute maximum response time for intermittent type deadman is now a requirement (*shall* replaces *should*) – added to A1
Table A15.4	Deadman closure time range corrected to 2-5 seconds
A15.8	End of Test – revised text 1. Confirm air reference pressure is set correctly *and re-sealed/locked*, all block-out devices have been removed and all vent port plugs have been replaced.
A16	New appendix – equipment calibration programme
A17	New appendix applicable to JIG JVs/JIG Inspected locations – includes (from Chapter 1) purpose, staff responsibilities and inspection requirements

JIG 2	Description of changes to JIG 2 - Issue 11
Intro	Updated glossary of terms, table of acronyms, list of useful publications and acknowledgements
	Removal of references to JVs and participant approvals throughout document. JIG JV/JIG inspected location requirements moved to new appendix A18
1.1	Purpose – part of this section and other parts of Chapter 1 moved to new appendix A18
1.2 (a)	Scope amended to refer to EI/JIG 1530 instead of JIG 3
1.3	Application section amended to remove references to JVs and participants. In paragraph 2, deleted "other" to clarify that AFQRJOS is not a specification
1.4	Updated inspection and variance approval requirements
1.4.1	New text: *It is expected that upstream facilities supplying into airports operating to JIG 2 standard have adopted EI/JIG 1530 standard.*
2.2	Reference to colour blindness and ability to visually assess fuel colours previously included in Chapter 11 (11.6.3) *ASTM International* replaces "American Society for Testing and Materials"
2.2.2	Multiple-tank Composite Sample permits the blending of a maximum of seven samples (was five). This is now consistent with EI/JIG 1530. "Running Sample" references throughout document are changed to "Line Sample" – Line sample definition is not changed
2.2.3 (a)	Clarification of need to rinse laboratory sample containers before use
2.2.3 (b)	Reference to closed sampling systems added. *Should* changed to *shall* and clarification that the use of buckets is in addition to glass sampling jars
2.3.1 (b)	Reference to EI/JIG 1530 added – for guidance on approved laboratories
2.3.2 (a)	Refinery Certificate of Quality – revised definition: *contains the results of measurements, made by the product originator's laboratory, of all the properties listed in the relevant fuel specification and, for Jet A-1, the requirements of the latest issue of the JIG Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS) Check List*
2.3.2 (b)	Certificate of Analysis – revised definition: *contains the results of measurements made of all the properties included in the relevant fuel specification and, for Jet A-1, the requirements of the latest issue of the JIG Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS) Check List*
2.3.2 I	Release Certificate – revised definition: This document supports any transfer of product, confirming compliance with *the relevant fuel specification and, for Jet A-1, the requirements of JIG Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS) Check List*
2.3.3	"in compliance with the fuel specification and approved by the company" replaces "Accepted for Aviation use" (final sentence)
2.3.4 (a)	COA Testing: This test covers all tests *required by the relevant fuel specification and, for Jet A-1,* the latest issue of the JIG Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS) Check List
2.3.4 (a)	New text regarding FAME: *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.
2.3.4 (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 A11/A12. 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)
2.3.4 (b)	Revised note 4: *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.
2.3.4 (e)	Commercial brand names removed Reference to IATA recommended types of chemical water detectors
2.3.4 (f)	Control Check – *3 kg/m3* changed to *3.0 kg/m3*
2.3.4 (i)	The investigation shall include an assay test for microbiological activity….("on-site" deleted) Reference to IATA list of recommended MBG Test Kits
2.3.4 (i)	Text referring to the JIG Technical Information document on MBG monitoring
2.3.4 (j)	"Chemical Water Detector" replaces "CWD" The table from 2.3.4 (j) is moved to 2.3.4 (k) - *minimum test requirements*
3.2.2	Requirement for aviation fuel tankage to be dedicated and grade segregated Reference to 3.1.7 (bunded) added to first paragraph *Should* changed to *shall* in four places
3.2.3 (a)	Mesh size 5 mm (0.2 inch) - previously shown as 5 mm (0.25 inch) Reference to flame arrestors added
3.2.3 (b)	In the case of above-ground vertical tanks, drain line should lead to a large capacity stainless steel or internally lined sample receiving vessel, provided with a self-closing (spring-loaded or equivalent) quick-acting valve at entry *and any sampling point upstream ….* Provision shall be made for taking a *line sample* from the tank drain line between the tank and the sample-receiving vessel *during flow*. (new text in *italics*) Reference to taking line sample into a stainless steel bucked is deleted
3.2.3 (f)	Clarified text: Floating suction arms, bonded to the tank shell, with position indicators and/or check cables, *also bonded to the tank shell*, shall be installed in Jet fuel tanks. *Floating suctions are also* recommended for Avgas
3.2.3 (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
3.2.3 (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 3.2.3 (i)
3.2.3 (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 have adequate controls in place to prevent overfill
3.2.3 (l)	This text was previously included in 3.2.3 (i)
3.3.2	New requirement for removal of pipework deadlegs (or fitting drain valves) Quarterly drain valve checks added to A1
3.4.1	*Receipt and loading systems shall have separate filter vessels.* (Clarification of existing JIG 2 requirement) For Jet Fuel, the 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 *shall* be used… (was *may* be used)… *and fitted with the correct class of EI 1581 latest edition elements (suitable for use in Jet fuel blended with FSII)*
3.5.1	Revised text concerning break-away type pit couplers and coupler lift assist devices. New text added: *The condition and integrity of all hydrant valves shall be tested in accordance with the procedure in Appendix A14*.
3.5.5	Area around hydrant pit covers to be marked as a warning to ramp users – new text

3.5.6	Corrected title for EI 1540
3.7	Reference to “mild steel” instead of “carbon steel” 4-5 inch gauges is equivalent to approx. 10-12 cm (not 10-15 as shown previously)
4.1.2	Reference to “technical authorities of the location management (replaces unanimous international participant agreement)
4.2.1	Reference to “technical authorities of the location management (replaces unanimous international participant agreement)
4.2.3	If, during product receipt, the depot receipt filter differential pressure rises at a much faster rate than is typical for the location, or if excessive water or solids are suspected or observed in routine samples, a colorimetric filter membrane test *should* be conducted upstream of receipt filtration as a check on the quality of the incoming product. The result, if greater than either 6 (wet) or 5 (dry), *should* be used to initiate further investigations…… (*Should* replaces *may)* …….but the result shall not be used as *the only reason* for halting the transfer or rejecting the product. (reference to pipeline transfer is deleted)
4.3.1	Receipt from single grade pipeline – samples shall be taken *upstream of any receipt filtration* and a Control Check *shall* be performed (was *should*)
4.3.2	Minor amendment to wording of section 4.3.3
4.3.3	Was included as section 4.3.2
4.5	Reference to HM 50 added (also included in list of useful publications)
4.5.1 (a)	Reference in (v) changed from JIG 3 to EI/JIG 1530 Standard
4.5.1 (e)	Control Check – *3 kg/m3* changed to *3.0 kg/m3*
4.6	Reference to change of grade procedure and Appendix A16 (new) added to second paragraph. Third paragraph: ……Therefore, *the FAME level* shall be checked following transportation and/or storage in multi-product distribution systems known to present a risk of FAME contamination (see Annex G of Defence Standard 91-91 for further guidance). Additional text added after third paragraph: *The receipt location shall ensure that their suppliers provide documentation, including cleaning certification, for all grade changes.* Fifth paragraph deleted
4.6.1	Receipt by truck/railcar – reference to safe working at height added (for checking seals etc)
4.6.2	Reference to water in substantial quantities after settling changed from 2 to 1 litre *Should* changes to *shall* in three places
4.6.3	Control Check – *3 kg/m3* changed to *3.0 kg/m3* (in two places) Clarification that the Appearance Check is required for each compartment sample
4.6.5	After discharge the compartments *shall* (was *should*) be checked to ensure that they are empty. *The preferred method is to check each compartment drain point for product.*
4.7	DCDs - agreement of the *senior management of the company* replaces reference to international participants 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 – *3 kg/m3* changed to *3.0 kg/m3* (in two places) Penultimate para: If the observed density differs by more than 3.0 kg/m^3 from the *calculated* expected value, there could be a problem and the matter requires further investigation. The first *possibility* to check …….
4.8	First para: …… Alternative solutions such as blending low conductivity fuel into higher conductivity fuel *should be used*. (delete *are preferred*)
4.8.3 (d)	Only *trained* operators….(delete *qualified*)
4.8.4	Revised text regarding the specification or AFQRJOS
5.1.1	Reference to *local* batch number
5.1.2	Control Check shall be carried out as defined in 5.3.1 *after settling*.
5.1.3	Control Check – *3 kg/m3* changed to *3.0 kg/m3*
5.3.2 (a)	Control Check – *3 kg/m3* changed to *3.0 kg/m3*

5.3.2 (b)	Clarification of when a COA test is required instead of a Recertification Test
6.1.1	Storage tank *and Product Recovery Tank* sumps/low points shall be checked daily for the presence of water and sediment *Line sample* replaces "running sample" Requirement for daily PRT check added to appendix A1
6.1.4	*A monthly functional check of high level alarms should also be performed where possible.* "(but not high-high alarms)" is deleted
6.2.1	Clarification of tank inspection and cleaning requirements Reference to *Filter Membrane Test* (instead of Millipore) Additional option for extended intervals between tank entry added as a footnote as follows: *Where the visual inspection without entry does not afford clear unobstructed views of the internal surfaces, and provided the tank design meets the minimum requirements of JIG 2, then annual MBG tests with results within permissible levels is an acceptable alternative.*
6.2.5	Reference to *Filter Membrane Test* (instead of Millipore)
6.4	Commercial brand names of test kits deleted and reference to IATA recommended test kits Note: Fuel samples from storage tanks for assay testing....("on-site" deleted)
7.1.1	Reference to 5.3.1 and 5.3.2 changed to 5.3
7.1.4	After completion of the steps above, *the tank shall be given a local batch number and* a Release Certificate (see 2.3.2 (e)) shall be prepared, *containing the local batch number as assigned in 5.1.1,* and approved by an authorised person .....(new text in italics)
7.2.1	When filling from the hydrant, fuellers shall not be bonded to the hydrant pit. *If a cordless deadman control is used, it shall be released if the operator is more than 10 meters from the loading point, or is out of line of sight of the loading point*. Fuellers shall not have the engine running during loading operations. Clarified overfill protection requirements for fuellers
7.2.2	Settling time after fueller loading before taking a sample for Visual Check is *at least 10 minutes* (was at least 5 minutes) *Vehicles may be moved from the loading area to a designated parking area, for settling after loading, before sampling* (new text)
8.1	References to EI 1560 and EI 1594 added to first paragraph (also added to list of useful publications)
8.1.1	"Running sample" changed to *line sample during flow*.
8.1.2	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.
8.2	Heading changed to *Hydrant Pits and Pit Valves* New sub-sections: *8.2.1 – Cleaning and Maintenance* *8.2.2 – Hydrant Pit Valve Checks* Revised text regarding monthly and annual checks New: *Annual wear check of API adaptor shall be carried out using the manufacturer's approved gauge*.
8.3	Clarified text: The equipment used for flushing low points and unused hydrant pits (including multi-purpose vehicles that also have pit cleaning capability) shall be designed for use with petroleum products and constructed to acceptable safety standards. *The equipment shall have satisfactory tank venting arrangements....* *New – All equipment used to conduct hydrant pit and low point tests shall be checked in accordance with JIG Standards and the manufacturer's requirements.* Requirement for pit flushing vehicles to be fitted with interlock systems – weekly function check added to A1. Reference to EI 1560 added.

8.4	New text about fuelling from a stand or section of hydrant where the ESB (fuel hydrant emergency shut-down) system is inoperative.
8.5	Reference to HSSE-MS Standard for safety precautions regarding entry to deep pits
8.7.1	Revised text regarding use of mobile leak detection equipment for 6-monthly checks of hydrants without tightness control systems (consistent with EI 1560) Reference to EI 1560 added.
8.7.2	Reference changed from API 570 to *API 570 and API 2611*, and API 2611 added to list of useful publications Reference to EI 1560 section 10.2.3 added for further details of testing
8.10	Reference to HSSE-MS Standard added
9.2	Equipment Calibration Programme added as 9.2.6
9.3	Reference to weekly computer back-up moved to first para of Chapter 9
9.5	Laboratory certificates to be retained for 7 years (previously 10 year minimum) Reference to Millipores changed to Filter Membrane Test records
9.5	Document retention – reference to year 2012 deleted.
10.3	Reference to meeting local legislation removed from opening paragraph
10.3.1	*The capacity of a volumetric proving tank shall not be less than the volume delivered by the meter under test (MUT) in one minute at maximum design flow rate and shall be of sufficient capacity to meet the requirements in HM20* *Master meters that are mobile and service more than one installation should be recalibrated annually or after 15 million litres have passed through them.* New paragraph: *Procedures shall ensure that product used during meter proving shall be returned to a tank of the same grade of fuel to prevent cross contamination*. Reference to meter calibration being carried out in accordance with HM 20 (meter proving) added to penultimate paragraph: *Meter proving shall be carried out in accordance with HM 20 and the EI Petroleum Measurement Manual, the API Manual of Petroleum Measurement Standards or equivalent industry standard.*
10.3.2	Requirement to verify that third party contractor procedures meet a recognized standard as well as JIG requirements in 4.9.1.
10.4	Reference to *filter differential pressure gauges* is deleted. Calibration is not required for dP piston type gauges. The required free movement test is covered in 10.4.3
10.4.2	Current calibration certificates for master gauges to be available
10.5.1	*(Grade 2)* added to EI 1529 – this is consistent with JIG 1 section 3.1.5 Reference to EN 1361 deleted Revised text regarding operating pressure limits for BS 3492 Type C pressure hose is not to be used for discharge from bridgers/railcars – suction hoses are required
10.5.2	Maximum 15 year service life for depot suction/gravity discharge hoses Reference to EI 1540 section 7.2.9 added – storage of new fueller loading and hydrant flushing hoses
10.5.3	Revised text for soaking and flushing of new fueller loading hoses and pit servicing vehicle hoses meeting EI 1529 or ISO 1825
10.6.1	Third para: The accuracy of all in-service instruments *shall be* checked at least once every 6 months against reference instruments meeting the above standards or in accordance with the other options given in 10.6.4. Resistance temperature devices (RTDs) shall be checked *6-monthly* against a reference thermometer. A1 updated to show RTD *6 months check* (was monthly)
10.6.4	*Shall* replaces *should* in first paragraph These checks *should* be …..(*should* replaces *may*)
10.7	*Should* changes to *shall* in four places *Permanently pressurised extinguishers should be fitted with a pressure gauge*

	Reference to 6 monthly testing for powder caking no longer required (unless specified by manufacturer)
10.8	Clarification – *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).* Annual check added to A1 Emergency shut-down systems *shall* be tested monthly (was *should*)
10.9	At airport depots only approved intrinsically safe mobile phones *shall* be used within the depot. Normal mobile phones *shall* only be used in the office building and shall remain in the office or other safe area. (*shall* replaces *may*)
10.10	Removal of standing water from bunds without delay added to housekeeping and maintenance section
10.12	Conductivity meters *shall be* calibrated at least every 3 years New – Continuity meters shall be calibrated in accordance with the manufacturer's requirements *Torque wrenches shall be calibrated in ft-lbs or Nm in a range including 0-50 ft-lbs / 0-68 Nm.* *Torque wrenches may also be required in a wider range to accommodate other applications*
10.13	New section – equipment calibration – reference to new appendix A17
10.14	New section - *Where installed on bridger receipt or fueller loading facilities the deadman control shall be performance tested at least monthly*. Added to Appendix A1
Chapter 11	Reference to JIG HSSE MS Standard replaces current text
A1	Updated table of frequencies of routine tests
A2	New Variance Approval Certificate form
A3	Reference to using variance approval process to amend PPE requirements is deleted Y = expected (was "mandatory")
A4	Reference to HSSE-MS Standard added
A5.3	Soak Testing Hoses - Clarification of soaking requirements for new flexible vehicle hoses Storage tanks – reference to requirements for unlined/partially lined tanks deleted
A5.3.1	Corrected title of EI 1541
A5.4	Soak test requirements table amended to remove reference to unlined tanks and show sample volume required (4 litres)
A6.1	Para 1 – reference to "self closing" valves added Para 3 – Air eliminators and pressure relief valves shall (was *should*) be maintained in accordance with manufacturer's recommendations *and at least annually* (annual requirement is new – added to A1) Para 5 – The maximum achievable flow rate through each filter vessel in service *shall*...(was *should*)... Maximum achievable flow rate shall be marked on the vessel *or a suitable area close to the vessel*.... *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)
A6.2.2	Maximum *achievable* (replaces maximum operating) flow rate
A6.3.1	Maximum *achievable* (replaces maximum operating) flow rate (in two places)
A6.3.2	Maximum *achievable* (replaces maximum operating) flow rate (in two places)
A6.3.3	Revised footnote about elements being wet with aviation fuel for testing
A6.3.4	Maximum *achievable* (replaces maximum operating) flow rate (in two places)
A6.7	Corrected description of test method ASTM D2276
A7	*Should* changes to *shall* in first para Microfilter elements added to table

	Deleted reference to gravimetric test results (only applicable to JIG 1)
A8	*Should* changes to *shall* in first para
A9	Re-titled as Tank Inspection *& Cleaning* Report
A11	Form for Avgas Recertification ("an example of a" removed from title) Correction – "Quantity Received" (not quality) Initial Boiling Point and acceptable difference added Distillation – some changes to acceptable differences
A12	Form for Jet A-1 Recertification ("an example of a" removed from title) Correction – "Quantity Received" (not quality) Saybolt Colour – ref to Def Stan 91/91 Annex E added to the acceptable differences Initial Boiling Point added FAME content – 50 max, two new IP test methods and reference to JIG Bulletin 75 MSEP reference to JIG Bulletin 65
A13	"Specification" removed from the title of A13
A13.1.1	"Apply pump pressure to fueller loading hoses" (revised text deleting reference to maximum pressure)
A13.2	New note about re-attachable end fittings (to be consistent with JIG 1 section 4.8.5) Reference to A13.1.2 in final paragraph (previously showed A5.1.2)
A13.3	Deteted reference to pressure testing of damaged hoses.
A14	Opening paragraph – "There shall also be a planned maintenance system….." (shall replaces should) New – *All equipment used to conduct tests shall be checked in accordance with the manufacturer's requirements.*
A14.1	A14.1.2.1 – heading changed to *Lanyard operated valves* A14.1.2.2 – heading changed to *Dual Air operated valves*
A14.2	Note (1) in first paragraph deleted – reference was to equipment which is now obsolete Reference to using a wristwatch at the end of first paragraph is deleted
A16	New appendix – change of grade and cleaning procedures for road and rail tank cars
A17	New appendix – equipment calibration programme
A18	New appendix applicable to JIG JVs/JIG Inspected locations – includes (from Chapter 1) purpose, staff responsibilities, inspection requirements