

MSEP PROTOCOL

This protocol supersedes the version of the JIG MSEP Protocol issued in June 2013 as Bulletin 65. The changes made are identified in **red text**. There is no change to the Test Protocol or to the requested actions.

Background

This protocol is written against the background of the prime fuel specifications that make up the latest edition of AFQRJOS 'Checklist' Issue 27, which includes Def. Stan 91-91 and ASTM D-1655.

Where the product is within facilities operated to JIG Standards, the following investigation protocol should be adopted in the event of a low MSEP result (or low average of results), i.e., less than 70, but greater than 50, has been obtained on recertification testing of Jet Fuel containing Static Dissipater Additive (SDA) or less than 85, but greater than 50, on recertification testing of Jet Fuel not containing SDA at an intermediate storage location downstream of the point of manufacture.

The purpose of this MSEP protocol is to avoid a supply disruption based on an MSEP failure alone. The protocol takes into account the poor repeatability of the test method (ASTM D3948) as it is currently specified, **the knowledge that this is often compromised when proper attention is not given to the method's sensitivity to sample preparation** and the knowledge gained from experience that low MSEP values do not necessarily indicate a problem with the fuel, either with contamination or water separation. For example, a result of 70 has a **published** reproducibility of **20**.

Despite this poor repeatability/reproducibility, JIG remains supportive of the use of MSEP testing downstream of the point of manufacture, when appropriate, because it can give an indication of contamination that would otherwise remain undetected. Low level metal/ surfactant contaminants also can decrease MSEP results and have the potential to deteriorate thermal oxidative stability (ASTM D3241/IP323). This protocol provides a procedure for interpreting and evaluating the significance of low MSEP results. Depending on the initial duplicate results, further sampling and testing of MSEP and thermal oxidative stability test testing will be conducted to determine a batch's suitability for onward shipment. Since strong surfactants can allow free water to pass through filter water separators, MSEP results of 49 and below will require an investigation by the relevant QC/Technical Authority prior to release.

New test methods are being developed under the auspices of the UK Energy Institute and ASTM and these will hopefully become available in the next few years. Once these new developments are in place and we have had a chance to evaluate their performance, advice on the use of the protocol may be modified.

As with any recertification test parameter, where MSEP values have decreased dramatically in distribution (for example, from 93 to 63), every effort should be made to investigate and understand the reason for the decrease. Furthermore, distribution systems that have to use this protocol frequently shall make a concerted effort to understand the root cause of re-occurring MSEP decreases. This will help develop corrective measures to prevent recurrence.

Test Protocol

- If the initial MSEP determination is below 70 with SDA, or 85 without SDA, a second MSEP determination shall be made on the original tank sample. If the average of the two results is higher than or equal to 70 with SDA, or higher than or equal to 85 without SDA, the average result shall be reported and no further action is needed. If the average of the two results is below 70 with SDA, or below 85 without SDA, a fresh composite sample shall be taken.
- The laboratory shall test the fresh composite sample in duplicate and calculate the average of the two results. Action shall be taken according to the table below.

All samples shall be supplied to the testing laboratory in fully epoxy-lined IATA type sample containers. (These cans need not be new, and can be recycled provided that appropriate cleaning is adhered to and the can is rinsed three times with the test fuel. See JIG Standards, Section 2.2.3 Sample Containers.)

Average MSEP result	Action
70 or higher with SDA 85 or higher without SDA	<ul style="list-style-type: none"> ➤ Enter the average MSEP result from the second sample onto the test certificate. Subject to all other properties meeting specification requirements the certificate can be issued and the Batch released subject to local procedures.
60 to 69 with SDA 70 to 84 without SDA	<ul style="list-style-type: none"> ➤ Enter the average MSEP result from the second sample onto the test certificate. Subject to all other properties meeting specification requirements the certificate can be issued. The Batch may be released without recourse to other Shipper(s) involved at the location concerned, subject to local procedures. ➤ The local Re-certifying authority shall endorse the certificate "MSEP result within precision limits of the test method". ➤ All shippers at the location should be advised of this occurrence retrospectively.
50 to 59 with SDA 50 to 69 without SDA	<ul style="list-style-type: none"> ➤ The local Re-certifying authority shall identify if any additional SDA was added to the product during receipt. The amount in mg/kg (if any) must be stated on the test certificate. ➤ The Re-certifying authority shall have a thermal oxidative stability (ASTM D3241 / IP 323 at 260°C) test carried out on the repeat sample. If the test result is satisfactory, enter it onto the test certificate. ➤ Enter the average MSEP result from the second sample onto the test certificate. Subject to all other properties meeting specification requirements the certificate can be issued. The Batch may be released without recourse to other Shipper(s) involved at the location concerned, subject to local procedures. ➤ The local Re-certifying authority shall endorse the certificate "Investigation for low MSEP result as required by the specification carried out in accordance with the JIG MSEP protocol". ➤ All shippers at the location should be advised of this occurrence retrospectively.

Average MSEP result	Action
Less than 50	<ul style="list-style-type: none"> ➤ This indicates possible contamination of the fuel and initially it should not be considered suitable for onward shipment. ➤ The local Re-certifying authority having notified the relevant JV QC/Technical representative of the initial result, investigation shall proceed as per the criteria detailed above for MSEP results between 50 and 59 – i.e. a thermal oxidative stability (ASTM D3241/ IP 323 at 260°C) test carried out on the repeat sample. ➤ The results shall be reported to the relevant JV QC/Technical representative who must contact all the JV participant representatives. Additional testing may be required. This may include investigation of retain samples of production material and retain samples from the supply route. ➤ The relevant JV QC/Technical representative shall present all results from this investigation for acceptance by the other shippers at the location concerned. ➤ MSEP results of less than 50 may require remedial action such as clay filtration to ensure the fuel is suitable for use.

Throughout transfers of fuel associated with batches released under this protocol, special care should be taken to ensure that water draining is done in accordance with JIG Standards 1, 2 and 3 (or EI/JIG 1530) to further ensure that the fuel is free of excess water and dirt when delivered into aircraft.

Subject to the endorsement of all shippers at a specific location the above protocol may be advised to their recertification laboratory(s) for automatic implementation should an MSEP result be obtained between 69 and 50 on the initial samples if fuel contains SDA, or between 84 and 50 for fuels not containing SDA. This is strongly recommended to avoid unnecessary delay to onward shipment to the airport. However, ensuring the integrity of on grade “fit for purpose” Jet Fuel is at all times the paramount consideration. Nothing in this protocol shall be deemed to override this principle. All shippers retain the right, in the absence of positive evidence of an investigation and any subsequent suitable corrective/preventative action, to ultimately withdraw their support for the use of this protocol.

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