

**Actions to be taken when weighing and measuring instruments are repaired, adjusted, altered or added to.**

**INTRODUCTION**

Manufacturers, repairers, users, self verifiers and inspectors have expressed concern about the consistency of approach when instruments are repaired, adjusted, altered or added to. The fundamental question being asked by each party is “Does the instrument need to be re-qualified before it is put back into service?” This guide outlines the legal framework that provides the answer to the question and details some frequently occurring examples that will assist in reaching a conclusion.

Much modern weighing and measuring equipment is composed of a number of components, each component having a different function within the complete instrument. Examples include electronic point of sale systems (EPOS), weighbridges and liquid fuel measuring systems: The manufacturer of the instrument connects together different components, e.g. load cells, meters, indicators and software to produce a complete instrument.

Under the EU directives the manufacturer of the complete instrument is responsible for the conformity assessment of the instrument when it is first placed on the market or put into use. For UK national legislation whilst the user is responsible for the status of the instruments they use, in practice this responsibility is also taken by the manufacturer, installer or distributor.

After the instrument has been on the market for a period of time components are often replaced, altered, adjusted or repaired as a result of damage or upgrade. In these situations the responsibility for legal status of the instrument remains with the user of the instrument. Those users rely heavily on manufacturers, installers and service companies to fulfil the obligation for legal compliance on their behalf.

Once the question “Does the instrument need to be re-qualified before it is put back into service?” has been answered the re-qualification authority is then confronted with the practical question of what tests to apply. Some tests are prescribed by regulation others require a more practical approach to the specific circumstance. Ultimately the person re-qualifying an instrument must make a judgement on the totality of compliance of the instrument.

**LEGAL BACKGROUND**

The requirement to re-qualify instruments comes from the ability or requirement for an inspector of weights and measures to disqualify the instrument in the first instance. If the instrument has been disqualified or could be so disqualified then before it is used for trade again it must undergo re-qualification.

An inspector can disqualify an instrument for a number of reasons

- The instrument has fallen outside of its permitted tolerance
- It does not fully comply with the requirements which apply to it
- If in the opinion of the inspector, the equipment has undergone any alteration, addition, adjustment or repair that could affect its accuracy or function.

Note: These are paraphrases of slightly differently worded criteria in different legislation.

There are a number of important points that can be drawn from this in deciding if a particular change to a component in an instrument could require it to be disqualified and therefore necessitate that instrument being re-verified.

- It is the opinion of the inspector as to whether the requirements of the alteration, adjustment, addition or repair will necessitate the equipment being rejected and consequently re-verified. This will be a question of fact, and dependent upon the circumstances of each individual case.
- It is not implicit that all alterations, adjustments, additions or repairs will affect compliance accuracy or function. Some of the changes may have no effect at all. From this we can suggest that changes to components in the instrument can take place which will not necessitate the instrument being re-verified.
- In deciding if an alteration, adjustment, addition or repair would facilitate a disqualification under the criteria outlined above it is essential that the inspector or other person ascertain all the activities that have been undertaken in connection with the instrument and form their opinion based on the totality of change. This will normally involve a physical inspection of the instrument and paperwork associated with the change.
- If the opinion is formed by an inspector or self verifier that the instrument would not be disqualified and hence requalification is not necessary that opinion should be made positively and recorded in such a way that it is traceable for future inspections.

All instruments must maintain a status of qualification (passed as fit for use for trade and stamped) whenever they are used for trade. This requirement is contained in;

- a) S11 of the Weights and Measures Act.
- b) 24(A) of the Non-Automatic Weighing Instruments Regulations 2000 (as amended)

Both these legal provisions confirm the requirement that instruments must have a current qualification status if used for trade and must therefore carry the prescribed stamp or re-qualification sticker applied subsequent to the alteration, adjustment, addition or repair.

In contrasting the procedures for re-qualification and conformity assessment the Guide to the implementation of Directives based on the New Approach and the Global Approach (THE BLUE GUIDE) offers an opinion that products which have been repaired without changing the original performance, purpose or type are not to be considered as new and are therefore not subject to another conformity assessment procedure. However, re-qualification is an in-service provision and to maintain the standards of metrological integrity in the UK it is considered necessary to evaluate the performance of instruments following such repairs that could affect the accuracy or function of the instrument

### **PRACTICAL IMPLEMENTATION**

From the legal background we can see that the question of whether the change of a component would require re-verification will be dependent upon a number of factors which will be determined by the inspector or other person on a "case by case" basis. The following questions will assist in determining whether each case necessitates a re-verification of the entire instrument. In previous advice to weights and measures inspectors before the advent of self verification and reflecting the routine nature of instrument inspection a presumption existed that changes do not affect accuracy and function unless there is information to the

contrary. Reflecting the integrated nature of public and private sector activities in this area it is now more appropriate to offer a neutral position when confronted by such changes to instruments. Thus a definite opinion must be formed in each case based on the specific changes and their impact.

1) Could the accuracy of the instrument have changed?

If the accuracy of the instrument could have changed as a result of changing a component, it is difficult to argue that the instrument should not be re-qualified.

Change of Component	Suggested Action	Questions that should be asked
<b>Change of load cell in weighbridge</b>	To be re-qualified	Although an identical model of load cell may have been replaced, the functioning of a load cell is dependant upon a large number of local environmental factors which can only be confirmed in-situ
<b>Change of pulser;</b> <ul style="list-style-type: none"> <li>• in liquid fuel dispenser</li> <li>• on a road tanker meter measuring system</li> </ul>	To be re-qualified	As a critical component in “counting” the revolutions of the meter unit had the deterioration of the previous unit been compensated for in recalibrations over time? Physically identical units can be calibrated against different EPROM software thus “counting” different amounts of fuel. Pulsers are often required to be sealed in the type approval certificates
<b>Change of meter;</b> <ul style="list-style-type: none"> <li>• on a road tanker meter measuring system tanker</li> <li>• in a liquid fuel dispenser</li> </ul>	To be re-qualified	This most significant metrological component is the main determinant of the measurement.
<b>Change of the indicator in a NAWI EPOS</b>	Not subject to disqualification	For a system where the indicator is a one way communication device that contains no data manipulation capability. Consideration should be had to the Declaration of Conformity and its ability to cover the new configuration. The indicator may itself have modular approval and be subject to the same test certificate as the original configuration.
<b>Change of a headwork in a;</b> <ul style="list-style-type: none"> <li>• weighbridge</li> <li>• liquid fuel dispenser</li> </ul>	To be re-qualified	In many instances the headwork of a weighbridge contains software that manipulates the electronic signal from the converter and could affect accuracy

2) Could the change of a module affect the functionality of the metrological aspects of the instrument?

If the change of the module has affected or may affect the functionality of the instrument it will need to be re-qualified i.e. if no functions have been added to, or removed for the instrument it is likely that it will be considered a “like for like” change and not need to be re-qualified.

Change of component	Suggested action	Questions that should be asked
<b>Change of a “like for like” EPOS in a weighing system</b>	No need to re-qualified	If the module is the same type and make as that which has been removed and had been conformity assessed in conjunction with an identical system it is felt that there is no change of functionality
<b>A) Replacement of a weighing module</b>	Not subject to dis-qualification	If the module is identical, retains the validity of the Declaration of Conformity and has undergone conformity assessment already
<b>B) Change to a different weighing module</b>	To re-qualify	If the module is not identical, or has itself been subject to alteration repair etc. or is not covered by the Declaration of conformity
<b>Upgrade of software</b>	To re-qualify	This would only be necessary to re-verify if the software is metrologically significant. For further guidance see WELMEC 2.3 and 7.2
<b>Change of card reader on a petrol pump</b> NB. Inspectors need to ascertain if other work has also been completed at the same time. Such as EPROM upgrades	No need to re-qualify	If the module is of the same make and type as one which is there, no need to re-verify. If non metrological changes have taken place e.g. swipe card to chip and pin
<b>addition of card reader on a petrol pump</b>	To re-qualify	The addition of a card acceptor or outside payment terminal changes the function of the equipment allowing it to operate without the presence of one of the parties to the contract.

3) Is the Type Approval Certificate still applicable?

If the changes are so significant that the type approval certificate on which the system is based has to be changed then the instrument will normally be considered as a new instrument and be subject to either conformity assessment for the first time or full national verification. Changes made to instruments that mean different amendments or variants of the type approval certificate apply would not be considered new and the above provisions apply.

4) Does the Declaration of Conformity (DoC) still apply?

This will depend upon how the Declaration was drafted when the instrument was first placed on the market. If the Declaration cannot apply to the instrument after the component has been changed, it is likely that it will need to be re-verified. For example, if the Declaration of Conformity lists serial numbers of the individual components it is unlikely that the existing DoC will apply if the modules are changed and the instrument need to be re-verified. If the DoC only lists the test certificate numbers of the components, as long as those test certificates remain the same, the instrument will not need to be re-verified.

5) The role of the Primary or Home Authority

Many changes to weighing and measuring instruments are undertaken as part of a regional or nation wide upgrade for whole companies. In this case the Primary Authority has a key role in advising the company on the need to ensure that their instruments retain a qualification status when they are used. Whilst the Primary Authority can supply useful information to inspectors of weights and measures about the intended changes it is often the case that at any specific location the proposed changes facilitate additional work. In some cases engineers may use the opportunity presented by the change to undertake other essential maintenance or upgrade work. It is the responsibility of the inspector to make an assessment of the work done in their area based on all the available information and form a specific opinion on the need to disqualify or not.

This opinion is based on the current information and practices operated in both the public and private sector of the industry. These can and will change over time and it may be necessary to add to or amend the opinion over time. If you wish to include any specific examples etc. that would support the document please contact NWML. Any suitable examples can be added to this document as a revision.

**Document Control**

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1.0	November 08	Original document