MARKETSURV MID

A JOINT PROJECT FOR MARKET SURVEILLANCE IN THE FIELD OF MEASURING INSTRUMENTS

Final report (public)

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1. Justification of the project

Market surveillance is vital to the smooth functioning of the Single Market. It is essential in protecting European consumers and workers against risks presented by non-compliant products. In addition, market surveillance helps to protect responsible businesses from unfair competition by unscrupulous economic operators who ignore the rules or cut corners. It should also act as a powerful deterrent.

But market surveillance in a context like the European one needs a coherent and common approach from all Member States, and coordination between the different enforcement authorities to detect, identify and remove from the market any non-compliant product, regardless of in which Member State that product is found. If that is not the case, the "faulty" products will inevitably end up in markets where the Member State's market surveillance is less strong and efficient.

This approach is applicable to all products with a harmonised European legislation, and among them, the measuring instruments regulated by the Directive 2004/22/EC (MID) and the non-automatic weighing instruments regulated by the directive 2009/23/CE (NAWID).[1]

Aware of this, the national legal metrology authorities gathered at WELMEC (European Cooperation in Legal Metrology) created a specific Working Group (WG5 Metrological Supervision) inside this WELMEC organization concerning market surveillance.

One of the main objectives of this group is to coordinate market surveillance and surveillance activities, to improve the coordination of the practical enforcement work, and to promote equivalent, effective and sufficient levels of metrological supervision across Europe, and thus achieve a level playing field for economic operators and an equal level of consumer protection across the EU.

With this goal in mind, encouraged by the European Commission, the WELMEC Committee and their national authorities, the members of WELMEC WG5 decided in 2013 to design and implement a European joint action concerning measuring instruments that was officially proposed in the WELMEC WG5 meeting which took place in Birmingham on the 12th and 13th September 2013. In 2015 WELMEC WG5 was recognised by the European Commission as an ADCO group.

In order to decide which kind of instruments were going to be subject to the market surveillance project, the market surveillance authorities that were in charge to do the preparatory work for the joint project followed the steps mentioned in chapter 5, Guide 5.3 "Risk Assessment Guide for Market Surveillance: Weigh and Measuring Instruments" to do a proper risk assessment procedure and selected active electrical energy meters and heat meters.

The reason for this choice was that, according to the "*Report on the implementation of the Measuring Instruments Directive 2004/22/EC pursuant to its Article 25"*, elaborated by the Commission for the European Parliament and the Council in June 2011 (COM(2011) 357 final), around 14 million active electrical energy meters are sold annually in the EU. This implies that this kind of instrument represents around 18.8% share of the measuring instruments EU annual market, occupying the first position in this statistic.

This figure will surely rise in the near future by the continuous efforts being made by the EU Institutions to promote the roll-out of smart metering systems, which will presumably provoke the massive substitution of millions of active electrical energy meters currently installed in the EU.

Therefore, the presence and installation of active electrical meters that do not comply with the MID could have a tremendous impact from the economical point of view as well as on the consumer confidence in the control system, severely damaging the regional, national and European institutions involved in consumer protection and market surveillance.

A similar situation, although smaller scale, can be argued for heat meters, 800.000 of which are annually sold in the EU, representing around 8.9% share of the measuring instruments EU annual market. The use of heat meters is highly promoted by the Commission as these meters are a key factor to improve energy efficiency in the domestic sector. These instruments had never been controlled in some Member States before the approval of MID and there were reasons to believe there was a potential risk of non-complying products being

[1] On 20 April 2016 both directives were replaced by Directive 2014 32/EU (MID) and Directive 2014/31/EU (NAWID), but the task of market surveillance has not changed.

sold and installed on the EU market. As a result WELMEC WG5 thought a market surveillance project was highly recommended in this particular field.

In order to obtain some financial support from the European Commission, the project (called "Market surveillance joint action for measuring instruments-MarketSurv MID") was submitted by a number of market surveillance authorities to the Call for proposals "*101/G/ENT/IMA/13/11212 - Joint enforcement actions and functioning of 'Administrative Cooperation groups' (ADCOs) under the multi-annual action plan for the surveillance of products in the EU*", included in the Grant Programme 2013 and was finally awarded with a grant that was formalised with the signature, in August 2014, of the Grant Agreement 101/G/ENT/IMA/13/112129.

2. Objectives of the project

The main objectives of the project were as followed:

1. To carry out a joint enforcement action in the participant Member States to verify that the utility meters put onto the EU market comply with the provisions of Directive 2004/22/EC (Measuring Instruments Directive or MID).
2. To enhance the efficiency and effectiveness of the market surveillance system concerning measuring instruments in Europe.
3. To improve the coordination of the practical enforcement work carried out in relation to measuring instruments in Europe to promote equivalent, effective and sufficient levels of metrological supervision across Europe, and thus achieve a level playing field for economic operators and an equal level of consumer protection across the EU.
4. To strengthen the confidence of EU citizens in the national and European market surveillance systems.
5. To promote and organise the exchange of information and guidance on market surveillance concerning measuring instruments in Europe, especially emphasising the use of the internet-supported information and communication system for the pan-European market surveillance application (ICSMS).
6. To show manufacturers, importers and different stakeholders involved in the energy sector that Member States are taking coordinated actions of market surveillance in this particular field.
7. To demonstrate the usefulness and applicability of the guidance documents published by WELMEC (European Cooperation in Legal Metrology) and encourage their use in order to establish a common interpretation of market surveillance provisions included in the Measuring Instruments Directive.
8. To promote the use of risk assessment in the definition and implementation of market surveillance programmes in Member States.
9. To promote consistency of interpretation and application of normative documents in Europe and propose actions to facilitate implementation.
10. To identify specific technical or legal problems that can arise while carrying out a market surveillance project concerning measuring instruments and propose solutions to those problems.
11. To start a data base of Best Practices in SME[2]-friendly market surveillance methods in Europe.

3. Participants

The following 12 market surveillance authorities participated in the project:

Participant name	Participant short name	Country	Population affected (MMp)
Bundesamt für Eich- und Vermessungswesen	BEV	Austria	8,2
Czech Trade Inspection	CTI	Czech Republic	10,5

[2] SME: Small and medium-sized enterprises.

Participant name	Participant short name	Country	Population affected (MMp)
Danish Safety Technology Authority	SIK	Denmark	5,6
Finnish Safety and Chemicals Agency	TUKES	Finland	5,4
Arbeitsgemeinschaft Mess- und Eichwesen	AGME	Germany	81,3
Consumer Rights Protection Centre	CRPC	Latvia	2,1
Verispect bv	VERISPECT	Netherlands	7,5
Metrology Institute of the Republic of Slovenia	MIRS	Slovenia	2
Consejería de Economía y Hacienda de la Comunidad de Madrid	ECOMAD	Spain[3]	46,4
Swedish Board for Accreditation and Conformity Assessment	SWEDAC	Sweden	9,5
Federal Institute of Metrology	METAS	Switzerland	8,3
National Measurement and Regulation Office (NMRO)	NMRO	United Kingdom	62,6
			249,4

As explained later, the joint project was divided in two different activities, one related to active electric energy meters and the other related to heat meters. The activity for the active electric energy meters was led by the project leader: the Consejería de Economía y Hacienda (ECOMAD), and the Federal Institute of Metrology (METAS) acted as project leader for the activities for heat meters. ECOMAD was also the Coordinator of the whole joint action in the participant's relations with the Commission. The whole group of participants will be called the Consortium from now on.

4. Description of the project

The joint enforcement action was made up of two different activities in the field of utility meters:

a) Joint project for full evaluation of active electric energy meters.

b) Joint project for full evaluation of heat meters.

Both types of instruments are included in the Measuring Instruments Directive scope and have to meet the essential requirements laid down in Annex I and in the relevant instrument-specific Annexes of the Directive (MI-003 for active electrical energy meters and MI-004 for heat meters).

A market surveillance action can consist of different levels of control depending on the approach the enforcement authority wants to apply. This can vary from a formal check or documentary control to a full evaluation.

In this particular case, the market surveillance action consisted in a full evaluation control including a documentary or formal one.

In order to design and implement the joint action, the following regulations, guidelines and harmonised standards were used:

1) Regulations:

- Directive 2004/22/EC of the European Parliament and of the Council of 31 March 2004 on measuring instruments.
- Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93.

2) Harmonised standards (normative document of MID-Annexes MI-003 and MI-004):

[3] In Spain, the Autonomous Communities are the competent authorities to carry out market surveillance in their territory so the National Government (represented by the Spanish Centre of Metrology) found suitable that Comunidad de Madrid acted as a participant in this particular project.

- EN 50470-1:2006 - Electricity metering equipment (a.c.) - Part 1: General requirements, tests and test conditions - Metering equipment (class indexes A, B and C).
- EN 50470-3:2006 - Electricity metering equipment (a.c.) - Part 3: Particular requirements - Static meters for active energy (class indexes A, B and C).
- EN 1434-4:2007 Heat meters - Part 4: Constructional requirements and Part 5 verification.

3) Guides and recommendations:

- WELMEC Guide 5.2 «Market Surveillance Guide (NAWI and MID)».
- WELMEC Guide 5.3 «Risk Assessment Guide for Market Surveillance: Weigh and Measuring Instruments».
- The 'Blue Guide' on the implementation of EU product rules (2014 edition).

In general, the action was to be carried out choosing two different types of active electrical meters and another two different types of heat meters for residential use in each participant's country, even though not all of the participants participated in both joint projects[4] and, in some cases, it was not possible to chose more than one instrument due to the lack of types different from the ones that were already being tested by other participants and the strict rules that were established to prevent double testing.

For every selected type of meter, each participant acquired three samples that were the object of the general controls and instrument-specific test listed below:

I. General controls:

- Formal checks/documentation control.
- Check of the suitable securing of the instrument and of the software version installed.

II. Instrument-specific test:

A. Active electric energy meters[5]:

- Examination of compliance to accuracy requirements:
  - Accuracy tests at reference conditions (section 8.7.2).
  - Repeatability (section 8.7.4).
- Accuracy with effects of influence quantities:
  - Voltage variation (section 8.7.5.3).
  - Frequency variation (section 8.7.5.4)
- Test of effects of disturbances of long duration:
  - Severe voltage variation (section 8.7.7.2).
  - Self-heating (section 8.7.7.5).
  - Accuracy in the presence of harmonics (section 8.7.7.7).
  - Influence of d.c. and even harmonics in the a.c. current circuit (section 8.7.7.8).
  - Odd harmonics and sub-harmonics in the a.c. current circuit (section 8.7.7.9).
- Short time over currents.
- Test of starting and no-load condition:
  - Test of no-load condition (section 8.7.9.2).
  - Initial start-up of the meter (section 8.7.9.3).
- Meter constant (section 8.7.10).

[4] Austria only participated in the heat meters project and the Netherlands and United Kingdom only did it in the active electric energy meters project.
[5] All the tests refer to EN-50470-3:2006.

B. Heat meters[6]:

- Performance test (section 6.4).
- Static magnetic field (section 6.16).
- Internal pressure (section 6.18).
- Pressure Loss (section 6.19).
- 24hrs interruption in supply voltage (section 6.21).

The scope of each control and test was uniform for all participants, this being guaranteed by the definition of a common protocol approved by all the participants.

The results from all these tests were put together and discussed with the rest of the participants that help each other to determine if the selected instruments presented a non-conformity.

In a case where non-conformities were detected, the affected participant handled the issue using its national legal procedures, but was able to share information and ask for advice to other participants.

When the national non-compliance procedures were finished, all the results were communicated to all Member States through ICSMS and a final report was made. The final report summarized the joint action taken, the protocols used, the instruments that had gone through the market surveillance action (brand and model), the results of the test and controls done and the way the participants had dealt with non-compliances, where applicable.

This final report was presented in a combined WELMEC WG5 MI ADCO workshop, where the different procedures used to deal with non-compliances were discussed in order to establish SME-friendly methods. This workshop was held before the WELMEC WG5 /ADCO MI-Meeting in April 2016.

The results of the joint action were disseminated to the related associations and the general public through national press releases.

5. Implementation of the project – Activities and timetable

All the necessary activities that needed to be undergone for a full evaluation project of market surveillance in metrology for each of the two projects in the joint action and, can be distributed in the following phases:

First phase: Start-up activities:

1) Kick-off meeting: The kick-off meeting was held the 2nd of October 2014 in Brussels and all participants attended it. During it, the main issues of the project (what to do, how and when to do it) were discussed and agreed.

2) Definition of the project: A brief description of the activities was prepared by both project leaders to inform all participants of what was going to be done and why. A draft of these two documents was presented during the kick-off meeting held in Brussels at the beginning of October 2014, where it was discussed and agreed by all the participants (see Annex 1).

3) Definition of the test protocols that were used in the market surveillance action for each instrument: In a joint project where different participants from all over Europe are supposed to carry out the same tests and share results and experiences, it is crucial to define a clear and strict protocol to do the work accordingly. This kind of document ensures that all the participants follow the same procedure to examine the different instruments involved in the action and register the corresponding results in a prefixed format thus facilitating their subsequent summary and analysis.

   Having this in mind, a draft of the corresponding protocols were prepared by both project leaders prior to the kick-off meeting and sent in advance to all the participants for comments. These documents contained the items that would have to be checked during the action as well as the templates of the reports that would have to be used to communicate the results.

   After some debate and correction of small mistakes, the final version was sent to all the participants (see Annex 2).

[6] All the tests refer to EN 1434-4:2007.

4) Selection of the instruments in the market surveillance action: The group of participants established the general rules that had to be used in order to select the specific instruments (manufacturer and type) that were going to be subject to the market surveillance project. In order to do it, the participants used the following criteria:

   - number of meters sold annually;
   - complaints received;
   - experience acquired in inspection in use actions;
   - experience acquired in past market surveillance projects.

   To avoid double-checking the same instruments by different countries, each participant informed the project leader of the two different models or types they wanted to check and added another optional two. The project leader made sure that all the selected types of instruments were different and when this condition was not fulfilled, he asked the affected participants to change their chosen one for an optional one. The final selection of instruments was communicated by the project leader to all participants.

5) Test laboratory selection: the Consortium established the general rules that had to be used by all the participants in order to select the laboratories where those tests that the MSA was not able to do itself should be carried out.

   The most common possibilities were the following:

   - The MSA had its own test facilities.
   - If that was not the case:
     - A national metrology institute / public laboratory was used to do the testing.
     - A private laboratory was used to do the testing. In that case, it was advised that the laboratory had an accreditation. If the laboratory didn't have an accreditation, the MSA was advised to undertake an investigation of the laboratory's competences, references, equipment, procedures, etc. and document the results meticulously.

   The Consortium agreed to avoid doing the testing at a lab of a notified body which had participated in the conformity assessment procedure of the tested instrument. However, if there was no other way to do the testing the participants were asked to guarantee the laboratory's independence (as can be assured in the case of national metrology institutes, for example).

   It was also agreed that all the participants would inform the corresponding project leader of the chosen laboratories and the costs of the tests. This data was supposed to be sent to the rest of the participants so if anyone was still looking for a laboratory or thought that his was more expensive they could ask for an offer in a different country.

   For heat meters the participants agreed to obtain 4 proposals from different laboratories because the prices were rather widely dispersed. The participants could then choose one of the 4 labs for testing if they hadn't chosen another one already.

Second phase: Field work of market surveillance activities:

6) Instruments acquisition: After selecting the instruments that were going to be examined, all the participants started the process to acquire them. This was sometimes more difficult than expected. For example, in the case of active electrical meters, this kind of instrument is not usually sold for the general public in some participants' countries but only to energy supply companies or installers.

   In other cases, it was impossible for the participants to acquire the initially selected meters, as they had been substituted for new models or as they were not available from the energy supply companies.

   In any case, all the participants dealt with these problems and were finally able to get the necessary samples, exception made for Finland and Czech Republic, that had to resign themselves to just one type instead of two as it was impossible for them to acquire the second ones because the rest of the meters that were being commercialized in their countries were already being tested by other participants.

7) Instruments examination: All the participants conducted the tests and controls according to the test protocol.

8) Test results gathering and processing: When all the test results were finalised, every participant sent them to the project leader who made a summary of detected non-conformities. The draft was sent to all the participants for suggestions.

9) Project meetings: Three one-day meetings were held for all participants to analyze the results and to discuss the best SME-friendly procedures to handle the non-compliances discovered. The summary of detected non-conformities was modified accordingly to the conclusions agreed in those meetings and the participants handled the non-compliances using the national legal proceeding. Some of the non-conformities were also discussed by email and this proved to be very useful.

10) Follow up of the actions taken by the market surveillance authority when a non-compliant instrument was detected: All the participants made a specific follow up of the actions to study how the different MSAs handled this kind of problems. In order to establish this control, each participant sent the project leader a brief description of the measures taken when a non-compliance was detected and how the whole matter was finally settled. All this was discussed during a one-day meeting with the rest of the participants.

Third phase: Dissemination of results and best practices:

11) Communication of results using ICSMS: The participants entered the data of their market surveillance action in ICSMS, thus sharing them with all the EU Members.

12) Workshop to study the results of the joint action: When the joint action was completed, a workshop was held with all the WELMEC WG5 and MI ADCO members to discuss and evaluate the entire process, the actions taken by the different participants when non-compliances were detected, the problems arisen and how the participants handled them. Members of WELMEC WG5 MI ADCO analyzed the joint action and exchange points of view. At the end of the workshop, Best practices (SME-friendly) were highlighted.

13) Dissemination of results: The results of the project were disseminated through press releases in each participants country. Some lectures were also given in national and international congresses.

Timetable

The joint action was designed as a 20 month project that started in September 2014 and finished at the end of April 2016 and was implemented following the next timetable:

	Month																			
Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
1st Phase: Start up activities																				
Kick-off meeting	X	X																		
Definition of the project	X																			
Definition of the test protocol that will be used in the market surveillance action for each instrument	X	X	X																	
Selection of the instruments that will go through the market surveillance action	X	X	X	X	X	X	X	X												
Test laboratory selection	X	X	X	X	X	X	X	X												
2nd Phase: Field work of market surveillance activities																				
Instruments acquisition		X	X	X	X	X	X													
Instruments examination			X	X	X	X	X	X												
Test results gathering and processing					X	X	X	X												
Project meeting								X	X											
Actions taken when a non-compliant instrument has been detected							X	X	X	X	X	X	X	X	X	X	X	X	X	X
Follow up of the actions													X	X	X	X	X	X	X	X

	Month																		
Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
taken by the market surveillance authority when a non-compliant instrument has been detected																				
3rd Phase: Dissemination of results, best practices																				
Communication of results through ICSMS														X	X	X	X	X	X	X
Workshop to study the results of the Joint action																				X
Dissemination of results																				X
Final report																				X

Table: Timetable of the project

6. Results

6.1 Active electric energy meters:

11 MSAs participated in this part of the project, where 22 meters from 13 different manufacturers were examined and tested in 11 different laboratories of the EU and Switzerland. 20 of the active electric energy meters were put into the market after using a conforming assessment procedure consisting of a module B + module D and the other 2 using a module H1. In those procedures, 6 notified bodies were involved in the modules B application, 8 in the modules D application and only one in the modules H1 (see table below).

	Number
Participants	11
Instruments in the project	22
Manufactures	13
Notified Bodies for module B	6
Notified Bodies for module D	8
Notified Bodies for module H1	1
Test laboratories	11

Table: General figures (active electric energy meter joint project)

Of the 22 active electric energy meters examined, 9 presented at least one non-conformity. The most common non-conformities were related to formal aspects (like the fact that the EC declaration of conformity was not provided with the instrument, the MID was not mentioned in it or mistakes were detected in its elaboration) and software aspects, being the most frequent case in the latter the impossibility to check the identification and the integrity of the legally installed software due, for example, to the absence of an special mention about how to do it on the EC-type examination certificate (TEC) or to differences between the software identification included in the TEC and the one installed on the meter.

Apart from that, in two cases a non-conformity with the sealing was detected. In the first one, the position and way of sealing had been changed without previous communication to the affected notified body and in the second, one of the established seals was missing. A good thing to highlight is that all the meters tested successfully passed all the laboratory tests.

	Number	**%**
Instruments in the project	22	
Non-compliant instruments	9	40,9%
- Formal aspects	6	27,3%
- Software aspects	6	27,3%
- Sealing aspects	2	9,1%
- Functional aspects	0	
- Other aspects	0	

Table: Detected non-conformities (active electric energy meter joint project)

As mentioned before, the 22 examined meters were produced by 13 different manufacturers, allowing to have a wide representation of different brands (see table below).

Manufacturer	Meters examined	%
Manufacturer 1	4	18,2%
Manufacturer 2	4	18,2%
Manufacturer 3	2	9,1%
Manufacturer 4	2	9,1%
Manufacturer 5	2	9,1%
Manufacturer 6	1	4,5%
Manufacturer 7	1	4,5%
Manufacturer 8	1	4,5%
Manufacturer 9	1	4,5%
Manufacturer 10	1	4,5%
Manufacturer 11	1	4,5%
Manufacturer 12	1	4,5%
Manufacturer 13	1	4,5%
Total	**22**	

Table: Manufacturers of the examined meters (active electric energy meter joint project)

Concerning the notified bodies involved in the conformity assessment procedures used by the manufacturers of the examined meters, the following tables show that most of the EC-type examination certificates were evaluated by one notified body that had an important presence in the market, leading the ranking in the 22 cases examined. On the other hand, modules D were being supervised by that very same notified body and a second one.

Notified Body	Meters examined	%
Notified body 1	12	60%
Notified body 2	3	15%
Notified body 3	2	10%
Notified body 4	1	5%
Notified body 5	1	5%
Notified body 6	1	5%
Total	20	

Table: NoBo involved in modules B (active electric energy meter joint project)

Notified Body	Meters examined	%
Notified body 3	7	35%
Notified body 1	6	30%
Notified body 2	2	10%
Notified body 4	1	5%
Notified body 5	1	5%
Notified body 7	1	5%
Notified body 8	1	5%
Notified body 9	1	5%
Total	20	

Table: NoBo involved in modules D (active electric energy meter joint project)

Notified Body	Meters examined	%
Notified body 10	2	100%
Total	2	

Table: NoBo involved in modules H1 (active electric energy meter joint project)

6.2 Heat meters:

10 MSAs participated in the heat meter part of the project, where 18 meter types from 13 different manufacturers where examined and tested in 7 different laboratories of the EU and Switzerland. All the heat meter types were put into the market after using a conforming assessment procedure consisting of a module B + module D. In those procedures, 4 notified bodies were involved in the modules B application and 5 in the modules D application (see table below).

	Number
Participants	10
Instruments in the project	18
Manufactures	13
Notified Bodies for module B	4
Notified Bodies for module D	5
Test laboratories	7

Table: General figures (heat meters joint project)

Of the 18 heat meters examined, 11 presented at least one non-conformity. The most common non-conformities were related to formal aspects (like the fact that the EC declaration of conformity was not provided with the instrument, the MID was not mentioned in it or mistakes were detected in its elaboration) and software aspects, the most frequent case of the latter being the impossibility to check the identification and the integrity of the installed legal part of the software due, for example, to the absence of a special mention about how to do it in the TEC.

All tested types of heat meters had no problems with the sealing marks. The seals corresponded with the descriptions in the Type Examination Certificates. Nevertheless, it is important to mention that one manufacturer sold the meter with a supplementary seal, probably destined to be used during installation.

6 types of the 18 tested heat meters failed one or more laboratory tests. For two of those types, all three samples failed the performance test (section 6.4 of EN 1434-4:2007). One out of three samples from four other types failed the performance test also. Two heat meters failed the internal pressure test (section 6.18 of EN 1434-4:2007) and one type failed the static magnetic test (section 6.16 from EN 1434-4:2007).

Also some formal non-conformities were found. With 5 of the tested types, the manufacturer did not provide the instrument with the Declaration of conformity. Also 5 types failed, because the markings of the type plate were not correct. Several times the units of measurement were missing on the plate.

In 12 cases, the information about how to read out the software version or to get the checksum was missing in the TEC. Nevertheless, several manufacturers included this information in the user manual, so it was possible for most Market Surveillance Authorities (MSA) to read out the software version and compare it with the TEC.

	Number	%
Types in the project	18	
Non-compliant instruments		
- Formal aspects	8	5.5 %
- Software aspects[7]	13	27.8 %
- Sealing aspects	1	5,5 %
- Functional aspects	6	38,9 %
- Other aspects	1	5,5 %

Table: Detected non-conformities (heat meters joint project)

The 18 tested types of heat meters are spread over 13 manufacturers. From 5 manufacturers 2 different types of heat meters were tested, and one type from the other 8.

Some of the tested heat meters were on the common market under different brands and led to a situation where the same type was selected to be tested by more than one participant. It was not until those participants have bought the meters and examined the Declaration of Conformity that they were able to detect that type was already being tested by someone else. That provoked that some participants could only test one type as one of the basic rules was that double testing (testing the same type by more than one participant was forbidden).

[7] Software version not possible to read out easily or not mentioned in the TEC.

Manufacturer	Meters examined	%
Manufacturer A	3	16,5 %
Manufacturer B	2	11 %
Manufacturer C	1	5,5 %
Manufacturer D	2	11 %
Manufacturer E	2	11 %
Manufacturer F	1	5,5%
Manufacturer G	1	5,5%
Manufacturer H	1	5,5%
Manufacturer I	1	5,5%
Manufacturer J	1	5,5%
Manufacturer K	1	5,5%
Manufacturer L	1	5,5%
Manufacturer M	1	5,5%
Total	**18**	

Table: Manufacturers of the examined meters (heat meters joint project)

Concerning the notified bodies involved in the conformity assessment procedures used by the manufacturers of the examined meters, the following tables show that one notified body was involved in most modules B and D.

It is important to mention that one of the meters that was part of the project was being advertised as an MID one but, when bought, it was detected that the meter didn't have the "M" marking in it and was not in conformity with MID. After a discussion with the manufacturer it was found out that the meter was being sold in Spain under a German type approval (not MID) valid until 30/10/2016, so it didn't have the CE marking.

The manufacturer alleged that it could sell the instrument in a different country from the one that issued the national type approval according to MID, article 23 (transitional provisions).

The meter got tested in the laboratory, but it doesn't appear in the following tables with the involved notified bodies.

Notified Body	Meters examined	%
Notified body A	12	70 %
Notified body B	2	12 %
Notified body C	2	12 %
Notified body D	1	6 %
Total	**17**	

Table: NoBo involved in modules B (heat meters joint project)

Notified Body	Meters examined	%
Notified body A	10	58 %
Notified body B	2	12 %
Notified body C	2	12 %
Notified body E	2	12 %
Notified body F	1	6 %
Total	**17**	

Table: NoBo involved in modules D (heat meters joint project)

ANNEX 1
Definition of the project

Project Description

Active electrical energy meter

Proactive project in Market Surveillance of Measuring Instruments in 2014 – 2015
MarketSurv MID Project - 101/G/ENT/IMA/13/11212

1 Responsible: Jorge Inesta – Spain
Tel: +34 91 580 2879/2178
Email: jorge.inesta@madrid.org

2 What is the justification for this project?

According to the Report on the implementation of the Measuring Instruments Directive 2004/22/EC pursuant to its Article 25, elaborated by the Commission for the European Parliament and the Council in June 2011 (COM(2011) 357 final)[1], around 14 million active electrical energy meters are sold annually in the UE. This implies that this kind of instruments represent around 18,8% share of the measuring instruments UE market, occupying the first position in this statistic.

This data will probably be increased in the near future by the continuous efforts being made by the UE Institutions to promote the roll-out of smart metering systems[2], which will presumably provoke the massive substitution of millions of active electrical energy meters currently installed in the UE.

Even though this type of instruments are usually installed and controlled by big companies with important quality control departments, the presence and installation of active electrical meters that don't comply with the MID could have a tremendous impact on the consumer confidence in the control system, severely damaging the regional, national and European institutions involved in consumer protection and market surveillance.

All these reasons were taken into account in the risk assessment carried out by the WELMEC subgroup using the general rules described in the Risk Assessment Guide for Market Surveillance (WELMEC Guide 5.3) and resulted in the conclusion that this type of instrument have a moderate risk and should be chosen for a European Project in market surveillance.

[1] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0357:FIN:EN:PDF
[2] See:
- Directive 2006/32/EC of the European Parliament and of the council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC.
- Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC.
- Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.
- Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.
- COMMISSION RECOMMENDATION of 9 March 2012 on preparations for the roll-out of smart metering systems (2012/148/EU).

3 **What is the purpose?**

☐ Screening

☐ Inspection

☑ Product Control

☑ Document Control

☑ Knowledge Building

☐ Communication

☐ Knowledge for standardization

The main objectives of this action are:

- to verify that the active electrical meters put into the UE market comply with the MID;
- to show the manufactures, importers, and different stakeholders involved in the electrical sector that the Member States are taking coordinated actions of market surveillance in this particular field; to strengthen the confidence of the EU citizens in the national and European market surveillance systems.

4 **How do we do it?**

This particular action will be carried out choosing two different types of active electrical meters for residential use or, if that is not possible, for commercial or light industrial use in each country.

In order to select the specific types, it is highly advisable to use the following criteria:

- number of meters sold annually;
- complains received;
- experience acquired in inspection in use actions;
- experience acquired in past market surveillance projects.

Each country will select two different types of active electrical meters and will acquire three samples of each of them.

The samples shall be obtained in the premises of one or two of the following:

☑ Manufacturers

☑ EU importers

☑ National importers

☑ Wholesaler

☑ Retail

☑ Internet Business

☐ Consumer (typically only target group)

☐ Focus range

☑ Suppliers warehouse

When acquired, the samples will be accompanied by the declaration of conformity (otherwise it should be required to the manufacturer or the importer afterwards). The authorities will also need to ask the manufacturer or the importer for the documents that prove that the instrument has gone through the conformity assessment procedures established in Directive 2004/22/EC (p.e. type examination certificate and annexes and quality assurance of the production process approval) and that allow it to check the apparent conformity with the product assessed (p.e. annexes of the type examination certificate).

Each of the six samples will be object of the following tests and exams:

- Formal checks/documentation control (see section 5.1 of WELMEC Guide 5.2).
- Check of the necessary seals and of the software version installed.
- Laboratory testing of the following characteristics (see section 5.3 of WELMEC Guide 5.2)[3]:
  - Examination of compliance to accuracy requirements:
    - Accuracy tests at reference conditions (section 8.7.2).
    - Repeatability (section 8.7.4).
  - Accuracy with effects of influence quantities:
    - Voltage variation (section 8.7.5.3).
    - Frequency variation (section 8.7.5.4)
  - Test of effects of disturbances of long duration:
    - Severe voltage variation (section 8.7.7.2).
    - Self-heating (section 8.7.7.5).
    - Accuracy in the presence of harmonics (section 8.7.7.7).
    - Influence of d.c. and even harmonics in the a.c. current circuit (section 8.7.7.8).
    - Odd harmonics and sub-harmonics in the a.c. current circuit (section 8.7.7.9).
  - Short time over currents.
  - Test of starting and no-load condition:
    - Test of no-load condition (section 8.7.9.2).
    - Initial start-up of the meter (section 8.7.9.3).
  - Meter constant (section 8.7.10).

5 **Cooperation with anyone outside the board?**

Cooperation with organisations or authorities outside the Board will not be needed in this project.

[3] All the test refer to EN-50470-3.

6 What are the rules and standards relevant to the intervention?

Regulations:

- Directive 2004/22/EC of the European Parliament and of the Council of 31 March 2004 on measuring instruments.
- Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93.

Standards:

- EN 50470-1:2006 - Electricity metering equipment (a.c.) - Part 1: General requirements, tests and test conditions - Metering equipment (class indexes A, B and C).
- EN 50470-3:2006 - Electricity metering equipment (a.c.) - Part 3: Particular requirements - Static meters for active energy (class indexes A, B and C).

Guides and recommendations

- WELMEC Guide 5.2 «Market Surveillance Guide (NAWI and MID)».
- WELMEC Guide 5.3 «Risk Assessment Guide for Market Surveillance: Weigh and Measuring Instruments».

7 Timetable

01.09.14:	Definition of the project.
02.10.14:	Kick-off meeting.
15.10.14:	Definition of the test protocol.
15.10.14:	Meters selection.
01.10.14 - 01.11.14:	Test laboratory selection.
01.11.14 - 01.12.14:	Instruments acquisition.
01.11.14 - 01.01.15:	Instruments examination.
01.01.15 - 01.05.15:	Test results gathering and processing.
01.03.15 - 01.12.15:	Actions taken when a non-compliant instrument has been detected.

8 What is necessary to participate?

Budget to buy the samples for the tests and to pay the involved laboratory.
Time budget to accompany the project and to report to the project leader.

A laboratory that fulfil the requirements. It is important to note that it is the responsibility of the Market Surveillance Authority (MSA) to assure that the test results are reliable. The MSA may use its own laboratory or instruct a third party laboratory. In case of contracting a laboratory, the MSA must be convinced of its qualification (e.g. by accreditation).
Special precautions are necessary when involving the same Notified Body the manufacturer contracted in the design and production phase of the

instrument. It is very important that there is impartiality with regard to the test results. In those cases the MSA may decide to witness the actual testing.

Project Description

Heat Meters

Proactive project in Market Surveillance of Measuring Instruments in 2014 – 2015
MarketSurv MID Project - 101/G/ENT/IMA/13/11212

1 Responsible: Hans-Anton Ebener – Switzerland
Tel: +41 58 387 03 33
Email: hans-anton.ebener@metas.ch

2 What is the justification for this project?

According to the Report on the implementation of the Measuring Instruments Directive 2004/22/EC pursuant to its Article 25, elaborated by the Commission for the European Parliament and the Council in June 2011 (COM(2011) 357 final)[1], around 800'000 heat meters are sold annually in the UE. This implies that this kind of instruments represent around 8.9% share of the measuring instruments UE market.

Heat meters are the only measuring instruments according to MID, which could be assembled of a flow sensor, a calculator and a temperature sensor. For such a combination all three part-instruments need the conformity test of MID.

This approach makes the authorities control much more difficult than with other measuring instruments.

With this project, several types, used in different member states, should be tested if they fulfill the MID-requirements.

Simultaneously, the control causes a strengthening of trust of users and citizens concerned by the measurement.

All these reasons were taken into account in the risk assessment carried out by the WELMEC subgroup using the general rules described in the Risk Assessment Guide for Market Surveillance (WELMEC Guide 5.3) and resulted in the conclusion that this type of instruments have a moderate risk and should be chosen for a European Project in market surveillance.

[1] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0357:FIN:EN:PDF

3 **What is the purpose?**

☐ Screening

☐ Inspection

☑ Product Control

☑ Document Control

☑ Knowledge Building

☐ Communication

☐ Knowledge for standardization

The main objectives of this action are:

- to verify that the heat meters put into the UE market fulfill the MID-requirements.
- to show the manufacturers, importers and different stakeholders involved that the Member States are taking coordinated actions of market surveillance in this particular field; to strengthen the confidence of the EU citizens in the national and European market surveillance systems.

4 **How do we do it?**

This particular action will be carried out choosing two different types of heat meters for residential use in each country.

In order to select the specific types, it is highly advisable to use the following criteria:

- number of meters sold annually;
- complains received;
- experience acquired in inspection in use actions;
- experience acquired in past market surveillance projects.

Each country will select two different types of heat meters (flow sensor, temperature sensor pair, and calculator or a combination thereof) and will acquire three samples of each of them.

The samples can be bought by the market surveillance authorities or can be obtained in the premises of one or two project partners:

☑ Manufacturers

☑ EU importers

☑ National importers

☑ Wholesaler

☑ Retail

☑ Internet Business

☑ Suppliers warehouse

When acquired, the samples will be accompanied by the declaration of conformity (otherwise it should be required to the manufacturer or the importer afterwards). The authorities will also need to ask the manufacturer or the importer for the documents that prove that the instrument has gone through the conformity assessment procedures established in Directive 2004/22/EC (i.e. type examination certificate and annexes and quality assurance of the production process approval) and that allow it to check the apparent conformity with the product assessed (i.e. annexes of the type examination certificate).

Each of the six samples will be object of the following tests and exams:

- Formal checks/documentation control (see section 5.1 of WELMEC Guide 5.2).
- Check of the necessary seals and of the software version installed.

Laboratory testing of the following characteristics (see section 5.3 of WELMEC Guide 5.2)[2]:

- Detailed tests of every mentioned point see on EN 1434-4:2007:
  - 6.4 Performance test (heat meter)
  - 6.16 Static magnetic field (heat meter)
  - 6.18 Internal pressure (flow sensor)
  - 6.19 Pressure Loss (flow sensor)
  - 6.21 24hrs interruption in supply voltage (calculator)

The test will be only done with complete devices (no subassemblies). Exceptionally, if all the complete devices that are present in one participant's market have being selected by other countries, it will be possible to choose combined heat meters).

5 **Cooperation with anyone outside the WELMEC WG 5?**

Cooperation with organizations or authorities outside the WELMEC WG 5 will not be needed in this project.

[2] All the test refer to EN-1434-4.

6 What are the rules and standards relevant to the intervention?

Regulations:

- Directive 2004/22/EC of the European Parliament and of the Council of 31 March 2004 on measuring instruments.
- Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93.

Standards (normative document of MID-Annex MI-004):

- EN 1434-4:2007 Heat meters - Part 4: Constructional requirements[3] and Part 5 verification.

Guides and recommendations

- WELMEC Guide 5.2 «Market Surveillance Guide (NAWI and MID)»
- WELMEC Guide 5.3 «Risk Assessment Guide for Market Surveillance: Weigh and Measuring Instruments»

7 Timetable

01.09.14:	Definition of the project.
02.10.14:	Kick-off meeting.
15.10.14:	Definition of the test protocol.
15.10.14:	Meters selection.
01.10.14 - 01.11.14:	Test laboratory selection.
01.11.14 - 01.12.14:	Instruments acquisition.
01.11.14 - 01.01.15:	Instruments examination.
01.01.15 - 01.05.15:	Test results gathering and processing.
01.03.15 - 01.12.15:	Actions taken when a non-compliant instrument has been detected.

8 What is necessary to participate?

Budget to buy the samples for the tests (if you don't obtain them from a project partner) and to pay the involved laboratory
Time budget to accompany the project and to report to the project leader.

A laboratory that fulfil the requirements. It is important to note that it is the responsibility of the Market Surveillance Authority (MSA) to assure that the test results are reliable. The MSA may use its own laboratory or instruct a third party laboratory. In case of contracting a laboratory, the MSA must be

[3] It's to discuss, if we take edition 2007 or 2009 for the tests.

convinced of its qualification (e.g. by accreditation).
Special precautions are necessary when involving the same Notified Body the manufacturer contracted in the design and production phase of the instrument. It is very important that there is impartiality with regard to the test results. In those cases the MSA may decide to witness the actual testing.

ANNEX 2
Test protocols

DOCUMENT: TEST PROTOCOL FOR MARKET SURVEILLANCE OF ACTIVE ELECTRICAL ENERGY METERS PROJECT 2014 – WELMEC WG 5 MARKETSURV MID PROJECT 101/G/ENT/IMA/13/11212

Edition	Reason for change	Date
1	Initial version	02-09-13
2	Revised version according to Birmingham meeting	08-09-14
3	Revised according to received comments	29-09-14
4	Revised according to received comments during the kick-off meeting	09-10-14
5	Revised according to received comments after the kick-off meeting	27-11-14
6	Revised to correct mistakes found in point 4.2 of the Formal checks	06-05-15

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1. MARKET SURVEILLANCE AUTHORITY

1.1	Market Surveillance Authority's name and address	
1.2	Country	
1.3	Person of contact for further details (name, address, telephone number and email)	

2. ACTIVE ELECTRICAL ENERGY METER DATA

2.1	Brand	
2.2	Type	
2.3	Manufacturer (name and address)	
2.4	Importer / Distributor (name and address)	
2.5	Where was the meter acquired?	☐ Manufacturer ☐ Importer ☐ Distributor ☐ Wholesaler/retailer ☐ Supplier warehouse
2.6	Other countries where the instrument (model) is on the market or in use (if the information is available)	
2.7	Serial numbers	
2.8	Year of manufacture	
2.9	Accuracy class	☐ A ☐ B ☐ C
2.10	Nominal Voltage, U_n	
2.11	Nominal frequency, f_n	
2.12	Nominal current, I_n	
2.13	Maximum current, I_{max}	
2.14	Transitional current, I_{tr}	
2.15	Minimum current, I_{min}	
2.16	Starting current, I_{st}	
2.17	Connection form	☐ Direct-connected ☐ Current transformer ☐ Current and voltage transformer
2.18	Connection mode (phases, wires and elements)	
2.19	Meter constant	
2.20	Indoor/Outdoor	
2.21	Environment classes	
2.22	Terminal arrangement (e.g: BS DIN)	
2.23	Insulation protection class	
2.24	Lower specified temperature	
2.25	Upper specified temperature	

2.26	Tilt/Mounting position	☐ Mounting position specified ☐ Any position is allowed
2.27	Conformity assessment modules used	☐ B + D ☐ B + F ☐ H1
2.28	Module: Certificate number	Module B: Module D or F: Module H1:
2.29	Module: Involved notified body (name and address)	Module B: Module D or F: Module H1:

3. LABORATORY THAT CARRIED OUT THE MARKET SURVEILLANCE TESTS

LABORATORY Nº 1[1]		
3.1	Name	
3.2	Address	
3.3	Type of laboratory	☐ MSA own facilities ☐ National metrology institute ☐ Other public laboratory ☐ Private laboratory
3.4	Accreditation	☐ The laboratory **has** an accreditation ISO/IEC 17025:2005 ☐ The laboratory **does not have** an accreditation ISO/IEC 17025:2005 ☐ CIPM MRA (Self-declaration ISO/IEC 17025:2005; only for National metrology institutes)
3.5	Test report number	

LABORATORY Nº 2		
3.6	Name	
3.7	Address	
3.8	Type of laboratory	☐ MSA own facilities ☐ National metrology institute ☐ Other public laboratory ☐ Private laboratory
3.9	Accreditation	☐ The laboratory **has** an accreditation ISO/IEC 17025:2005 ☐ The laboratory **does not have** an accreditation ISO/IEC 17025:2005 ☐ CIPM MRA (Self-declaration ISO/IEC 17025:2005; only for National metrology institutes)
3.10	Test report number	

[1] Add as many laboratory tables as needed.

4. FORMAL CHECKS

	CHECK	Yes	No	NA
4.1	Units of measurement Valid units of measurement (kWh or MWh)	☐	☐	☐
4.2	Rated operating conditions (see Table 1): Check I_{st}/I_{tr} ratio complies Check I_{min}/I_{tr} ratio complies Check I_{max}/I_{tr} ratio complies	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐
4.3	Meter marking (the following information is marked on the meter and corresponds to the approved one):			
	Manufacturer	☐	☐	☐
	Nominal voltage U_n	☐	☐	☐
	Maximum current I_{max}	☐	☐	☐
	Nominal current I_n	☐	☐	☐
	Minimum current I_{min}	☐	☐	☐
	Approval marks CE Myy Notified Body number _____	☐	☐	☐
	Number of the EC-type examination certificate or the EC design examination certificate	☐	☐	☐
	Serial number	☐	☐	☐
	Number of phases	☐	☐	☐
	Number of wires	☐	☐	☐
	~~Register multiplier (if other than unity)~~[2]	☐	☐	☐
	Meter constant	☐	☐	☐
	Year of manufacture	☐	☐	☐
	Accuracy class	☐	☐	☐
	Meter type	☐	☐	☐
	Temperature range	☐	☐	☐
	Nominal frequency f_n	☐	☐	☐
	The connection mode(s) for which the meter is specified	☐	☐	☐
	Connection terminals uniquely identified to distinguish between terminals	☐	☐	☐
4.4	Written declaration of conformity available	☐	☐	☐
4.5	Written declaration of conformity suitable	☐	☐	☐
4.6	Written declaration of conformity indicates that the meter complies with the essential requirements stated in Directive 2004/22/EC using the standard EN-50470-1:2006	☐	☐	☐
4.7	Written declaration of conformity indicates that the meter complies with the essential requirements stated in Directive 2004/22/EC using the standard EN-50470-3:2006	☐	☐	☐

[2] Even though this item was initially included in the protocol, the participants decided not to take it into account as this requisite was prescribed by OIML R-46, not an harmonized standard, and thus not a necessary requisite to comply with according to MID.

	CHECK	Yes	No	NA
4.8	Certificate and/or report drawn up by notified body available			
	Module B:	☐	☐	☐
	Module D:	☐	☐	☐
	Module F:	☐	☐	☐
	Module H1:	☐	☐	☐
4.9	Certificate and/or report drawn up by notified body suitable			
	Module B:	☐	☐	☐
	Module D:	☐	☐	☐
	Module F:	☐	☐	☐
	Module H1:	☐	☐	☐
4.10	The instrument is accompanied by information on its operation (instruction manual)[3]	☐	☐	☐
4.11	The active electrical energy meter has been secured according to the EC-type examination certificate or the EC design examination certificate	☐	☐	☐
4.12	An indication of the software version installed in the meter is accessible	☐	☐	☐
4.13	An indication of the software checksum or similar is accessible	☐	☐	☐
4.14	The software version that should be installed was specified in the EC-type examination certificate or in the EC design examination certificate	☐	☐	☐
4.15	The relevant checksum or similar for each software version that should be installed was specified in the EC-type examination certificate or in the EC design examination certificate.	☐	☐	☐
4.16	The way to read out the software version installed in the meter and relevant checksum or similar, was explained in the EC-type examination certificate or in the EC design examination certificate.	☐	☐	☐
4.17	The way to read out the software version installed in the meter and relevant checksum or similar, was explained in the supported documents, instruction manual of other technical documentation provided by manufacturer for installation purposes.	☐	☐	☐
4.19	The software version installed is identical to the version indicated in the EC-type examination certificate or in the EC design examination certificate	☐	☐	☐
4.20	The checksum of the installed software version is identical to the version indicated in the EC-type examination certificate or in the EC design examination certificate	☐	☐	☐
4.21	The way to read out the software version installed in the meter and relevant checksum or similar explained in the documents mentioned on checks 4.16 or 4.17 proved to be correct.	☐	☐	☐

[3] Please note that section 9.4 of Annex I of Directive 2004/22/EC establishes that "*Groups of identical measuring instruments used in the same location or used for utility measurements do not necessarily require individual instruction manuals*" so it could be considered enough that this instruction manual is available in a webpage or similar unless the national laws state otherwise.

5. LABORATORY TESTING OF THE FOLLOWING CHARACTERISTICS (ACCORDING TO EN-50470-3:2006)

	CHECK	Yes	No	NA
Examination of compliance to accuracy requirements				
5.1	The active electrical energy meter has successfully passed the accuracy tests at reference conditions, indicated on section 8.7.2	☐	☐	☐
5.2	The active electrical energy meter has successfully passed the repeatability test indicated on section 8.7.4	☐	☐	☐
Examination of compliance to accuracy requirements with effects of influence quantities				
5.3	The active electrical energy meter has successfully passed the voltage variation test indicated on section 8.7.5.3	☐	☐	☐
5.4	The active electrical energy meter has successfully passed the frequency variation test indicated on section 8.7.5.4	☐	☐	☐
Examination of effects of disturbances of long duration				
5.5	The active electrical energy meter has successfully passed the severe voltage variation test indicated on section 8.7.7.2	☐	☐	☐
5.6	The active electrical energy meter has successfully passed the self-heating test indicated on section 8.7.7.5	☐	☐	☐
5.7	The active electrical energy meter has successfully passed the accuracy test in the presence of harmonics indicated on section 8.7.7.7	☐	☐	☐
5.8	The active electrical energy meter has successfully passed the influence test of d.c. and even harmonics in the a.c. current circuit indicated on section 8.7.7.8	☐	☐	☐
5.9	The active electrical energy meter has successfully passed the influence test of odd harmonics and sub-harmonics in the ac. current circuit indicated on section 8.7.7.9	☐	☐	☐
Examination of effects of disturbances of short duration				
5.10	The active electrical energy meter has successfully passed the influence test of short time over currents indicated on section 8.7.8	☐	☐	☐
Examination of starting and no-load condition				
5.11	The active electrical energy meter has successfully passed the test of no load condition indicated on section 8.7.9.3	☐	☐	☐
5.12	The active electrical energy meter has successfully passed the starting test indicated on section 8.7.9.4	☐	☐	☐
Examination of meter constant				
5.13	The active electrical energy meter has successfully passed the test of meter constant indicated on section 8.7.10	☐	☐	☐

6. PHOTOGRAPHS OF THE METER

Please include a couple of photographs of the instrument. At least one of the whole meter and another two or more that show the detail of the sealing and the type plate.

7. NON-CONFORMITIES ACCORDING TO FORMAL CHECKS

In any case non-conformities detected in formal checks should be documented, as minimum by:

Relevant photo of non-conformity or copy of document
Brief description of non-conformity, reference to the corresponding article, point of Directive 2004/22/EC

8. RISK CALCULATION AND CLASSIFICATION

Note: Please include the result of the Risk Classification of Market Surveillance classes for ICSMS tool and annex the Excel tables of the tool if a non-conformity is detected.

ANNEX

Table 1

	Class A	Class B	Class C
For direct-connected meters			
I_{st}	$\leq 0{,}05 \cdot I_{tr}$	$\leq 0{,}04 \cdot I_{tr}$	$\leq 0{,}04 \cdot I_{tr}$
I_{min}	$\leq 0{,}5 \cdot I_{tr}$	$\leq 0{,}5 \cdot I_{tr}$	$\leq 0{,}3 \cdot I_{tr}$
I_{max}	$\geq 50 \cdot I_{tr}$	$\geq 50 \cdot I_{tr}$	$\geq 50 \cdot I_{tr}$
For transformer-operated meters			
I_{st}	$\leq 0{,}06 \cdot I_{tr}$	$\leq 0{,}04 \cdot I_{tr}$	$\leq 0{,}02 \cdot I_{tr}$
I_{min}	$\leq 0{,}4 \cdot I_{tr}$	$\leq 0{,}2 \cdot I_{tr}$ (1)	$\leq 0{,}2 \cdot I_{tr}$
I_n	$= 20 \cdot I_{tr}$	$= 20 \cdot I_{tr}$	$= 20 \cdot I_{tr}$
I_{max}	$\geq 1{,}2 \cdot I_n$	$\geq 1{,}2 \cdot I_n$	$\geq 1{,}2 \cdot I_n$

(1) For Class B electromechanical meters $I_{min} \leq 0{,}4 \cdot I_{tr}$ shall apply.

DOCUMENT: TEST PROTOCOL FOR MARKET SURVEILLANCE OF HEAT METERS PROJECT 2014 – WELMEC WG 5 MARKETSURV MID PROJECT 101/G/ENT/IMA/13/11212

Edition	Reason for change	Date
1	Initial version	02-09-13
2	Revised version according to Birmingham meeting	29-09-14
3	Revised according to received comments during the kick-off meeting in Brussel, 2 Oct. 2014	22-10-14

Supported by the European Commission
Directorate General Enterprise & Industry

1. MARKET SURVEILLANCE AUTHORITY

1.1	Market Surveillance Authority's name and address	
1.2	Country	
1.3	Person of contact for further details (name, address, telephone number and email)	

2. HEAT METER DATA

2.1	Brand	
2.2	Type	
2.3	Manufacturer (name and address)	
2.4	Importer / Distributor (name and address)	
2.5	Where was the meter acquired?	☐ Manufacturer ☐ Importer ☐ Distributor ☐ Wholesaler/retailer ☐ Supplier warehouse
2.6	Other countries where the instrument (model) is on the market or in use (if the information is available)	
2.7	Serial numbers	
2.8	Year of manufacture	
2.9	Accuracy class	☐ 1 ☐ 2 ☐ 3
2.10	Limits of flow rate	
2.11	Limits of temperature	
2.12	Nominal meter factor (e.g. litres/pulse) or corresponding output signal	
2.13	Indication of the direction of flow	
2.14	Conformity assessment modules used	☐ B + D ☐ B + F ☐ H1
2.15	Certificate(s) number Module B (TEC): Module D or F: Module H1:	
2.16	Involved notified body Module B: Module D or F: Module H1:	

3. LABORATORY THAT CARRIED OUT THE MARKET SURVEILLANCE TESTS

LABORATORY Nº 1[1]		
3.1	Name	
3.2	Address	
3.3	Type of laboratory	☐ MSA own facilities ☐ National metrology institute ☐ Other public laboratory ☐ Private laboratory
3.4	Assessment / Accreditation	☐ The laboratory **has** an accreditation ISO/IEC 17025:2005 ☐ The laboratory **does not have** an accreditation ISO/IEC 17025:2005 ☐ CIPM MRA (Self-declaration ISO/IEC 17025:2005; only for National metrology institutes)
3.5	Test report number	

LABORATORY Nº 2		
3.6	Name	
3.7	Address	
3.8	Type of laboratory	☐ MSA own facilities ☐ National metrology institute ☐ Other public laboratory ☐ Private laboratory
3.9	Assessment / Accreditation	☐ The laboratory **has** an accreditation ISO/IEC 17025:2005 ☐ The laboratory **does not have** an accreditation ISO/IEC 17025:2005 ☐ CIPM MRA (Self-declaration ISO/IEC 17025:2005; only National metrology institutes)
3.10	Test report number	

[1] Add as many laboratory tables as needed.

4. FORMAL CHECKS

	CHECK	Yes	No	NA
4.1	Units of measurement Valid unit of measurement (kWh)			
4.2	Meter marking (the following information is marked on the meter and corresponds to the approved one):			
	Manufacturer			
	Minimum of flow rate q_i			
	Maximum of flow rate q_p			
	Highest value of q that is permitted for short periodes of time q_s			
	Temperature of the heat-conveying liquid Θ			
	Limits of temperature difference Θ_{in}- Θ_{out} = ΔΘ			
	Place of the flow sensor installation: flow or return			
	Indication of the direction of flow			
	Approval marks CE Myy Notified Body number _____			
	Number of the EC-type examination certificate or the EC design examination certificate			
	Serial number			
	Year of manufacture			
	Accuracy class			
	Type of the temperature sensor pair			
4.3	Written declaration of conformity available			
4.4	Written declaration of conformity suitable			
4.5	Written declaration of conformity indicates that the meter complies with the essential requirements stated in Directive 2004/22/EC using the standard EN-1434-4:2007			
4.6	Written declaration of conformity indicates that the meter complies with the essential requirements stated in Directive 2004/22/EC using the standard EN-1434-4:2007			
4.7	Certificate and/or report drawn up by notified body available			
	Module B:			
	Module D:			
	Module F:			
	Module H1:			
4.8	Certificate and/or report drawn up by notified body suitable			
	Module B:			
	Module D:			
	Module F:			
	Module H1:			
4.9	The instrument is accompanied by information on its operation (instruction manual)[2]			

[2] Please note that section 9.4 of Annex I of Directive 2004/22/EC establishes that "*Groups of identical measuring instruments used in the same location or used for utility measurements do not necessarily require individual instruction manuals*" so it could be considered enough that this instruction manual is available in a webpage or similar unless the national laws state otherwise.

CHECK		Yes	No	NA
4.10	The heat meter has been secured according to the EC-type examination certificate or the EC design examination certificate			
4.11	An indication of the software version installed in the meter is accessible			
4.12	An indication of the software checksum or similar is accessible			
4.13	The software version that should be installed was specified in the EC-type examination certificate or in the EC design examination certificate			
4.14	The relevant checksum or similar for each software version that should be installed was specified in the EC-type examination certificate or in the EC design examination certificate.			
4.15	The way to read out the software version installed in the meter and relevant checksum or similar, was explained in the EC-type examination certificate or in the EC design examination certificate.			
4.16	The way to read out the software version installed in the meter and relevant checksum or similar, was explained in the supported documents, instruction manual of other technical documentation provided by manufacturer for installation purposes.			
4.17	The software version installed is identical to the version indicated in the EC-type examination certificate or in the EC design examination certificate			
4.18	The checksum of the installed software version is identical to the version indicated in the EC-type examination certificate or in the EC design examination certificate			
4.19	The way to read out the software version installed in the meter and relevant checksum or similar explained in the documents mentioned on checks 4.15 or 4.16 proved to be correct.			

5. LABORATORY TESTING OF THE FOLLOWING CHARACTERISTICS (ACCORDING TO EN-1434-4:2007)

CHECK		Yes	No	NA
Examination of compliance to requirements				
5.1	Performance test - flow sensor, according to point 6.4.2 of EN 1434-4:2007			
5.2	Static magnetic field – complete heat meter, according to point 6.16 of EN 1434-4:2007			
5.3	Internal pressure – flow sensor, according to point 6.18 of EN 1434-4:2007			
5.4	Pressure Loss - flow sensor, according to point 6.19 of EN 1434-4:2007			
5.5	24hrs interruption in supply voltage – complete heat meter, according to point 6.21 of EN 1434-4:2007			

6. PHOTOGRAPHS OF THE METER

Please include a couple of photographs of the instrument. At least one of the whole meter and another two or more that show the detail of the sealing and the type plate..

7. NON-CONFORMITIES ACCORDING TO FORMAL CHECKS

In any case non-conformities detected in formal checks should be documented, as minimum by:

Relevant photo of non-conformity or copy of document
Brief description of non-conformity, reference to the corresponding article, point of Directive 2004/22/EC

8. RISK CALCULATION AND CLASSIFICATION

Note: Please include the result of the Risk Classification of Market Surveillance classes for ICSMS tool and annex the Excel tables of the tool if a non-conformity is detected.