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Crews of Vehicles Engaged in International Road Transport (AETR)

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Programme of Work:

**Memorandum of Understanding between the European Commission Services and UNECE
which recognizes the Joint Research Centre as the authority responsible
for Root and Interoperability Certification for non-EU AETR Contracting Parties**

Digital Tachograph Memorandum of Understanding between the European Commission Services and the United Nations Economic Commission for Europe: history and status

Submitted by Joint Research Centre*

* This document was submitted late due to delayed inputs from other sources.

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I. Establishment of a MoU between the UNECE and the European Commission

1. Back in 2008, in view of the forthcoming deployment of the digital tachograph on vehicles involved in international journeys on the territories of UNECE AETR (European Agreement Concerning the Work of Crews of Vehicles engaged in International Road Transport), it was necessary to establish a Memorandum of Understanding in order to formally identify:

- the laboratory for interoperability certification for non-EU AETR countries;
- the root certification authorities for non-EU AETR countries;
- the procedures for identifying national authorities in non-EU AETR countries and subsequent national European Root Certification Authority (ERCA) policy approval plus regular auditing.

2. A preparatory meeting with the UNECE, the Directorate General for Mobility and Transport of the European Commission (DG MOVE) and the Joint Research Centre of the European Commission (JRC) took place on 7 May 2008. Other information meetings were then organized with Russian Federation (4-5 March 2008) and Ukraine (1 August 2008).

3. A draft MoU was circulated in October-November 2008. The MoU entered into force in January 2009.

4. The formal overall objective of the MoU is “to contribute more effectively to understanding and resolving issues pertaining to the full implementation of the digital tachograph requirements of the AETR, especially in the non-EU Contracting Parties to it”.

5. The MoU is established between UNECE, DG MOVE and the JRC, two European Commission Services.

6. With the MoU, the UNECE recognizes the JRC as the AETR Authority for Root Certification and for interoperability certification for the non-EU Contracting Parties to the AETR.

II. Current status – March 2012

7. In total, 49 countries are currently using or finalizing the implementation of the digital tachograph: the 27 EU countries and 22 non-EU AETR countries (the national Authority of Uzbekistan has been recently identified). Georgia is engaged in preparation activities in view of identifying of its national authority. Until now, there has been no sign from Turkmenistan.

8. Regarding the identification process, there are still two potential countries to identify (Georgia and Turkmenistan).

9. Potentially, three ERCA policies have still to be approved (Uzbekistan, Georgia and Turkmenistan).

10. Leaving apart these few remaining authorities to be identified, the work carried by the JRC for the non-EU AETR countries is identical to that provided to EU countries, notably:

- ERCA signing sessions for initial or renewal of national certificates;
- Follow-up and verification of national authorities audit;

- Interoperability certification of new tachograph equipment;
- Maintenance of the database with national authorities details. The tables below are extracted from the Digital Tachograph website (<http://dtd.jrc.ec.europa.eu/index.php>) hosted by JRC, and list the identified countries so far:

EU Countries

	<i>Country</i>
1.	Austria
2.	Belgium
3.	Bulgaria
4.	Cyprus
5.	Czech Republic
6.	Denmark
7.	Estonia
8.	Finland
9.	France
10.	Germany
11.	Greece
12.	Hungary
13.	Ireland
14.	Italy
15.	Latvia
16.	Lithuania
17.	Luxembourg
18.	Malta
19.	Netherlands
20.	Poland
21.	Portugal
22.	Romania
26.	Sweden
27.	United Kingdom

Non EU-Countries

	<i>Country</i>
1.	Albania
2.	Andorra
3.	Armenia
4.	Azerbaijan
5.	Belarus
6.	Bosnia and Herzegovina
7.	Croatia
8.	Iceland
9.	Kazakhstan
10.	Liechtenstein
11.	Monaco
12.	Montenegro
13.	Norway
14.	Republic of Moldova
15.	Russian Federation
16.	San Marino
17.	Serbia
18.	Switzerland
19.	The former Yugoslav Republic of Macedonia
20.	Turkey
21.	Ukraine
22.	Uzbekistan

III. Respective roles

11. The MoU identifies the Parties and their respective roles. The operational actions governed by the MoU are listed as follows:

For UNECE:

- (a) non-EU AETR Contracting Parties identification;
- (b) cards additional features checking;
- (c) database of approval certificates and notifications of refusal;
- (d) database of approved fitters and workshops;
- (e) monitor type approval dispute;
- (f) guides the non-EU AETR Contracting Parties in their effort to implement the tachograph;
- (g) database of non-EU AETR Contracting Parties able to respect the 4 year deadline;
- (h) contact point for the Risk Management Group (RMG);
- (i) inform non-EU AETR Contracting Parties to have a single AETR Root Certification Authority (RCA) established;
- (j) support the establishment of a UNECE Trust Fund.

12. For European Commission services:

- (a) responsible for ERCA;
- (b) responsible until 30 June 2012 for the AETR-RCA (offering same conditions as for the EU 27);
- (c) contributes to :
 - (i) capacity-building for developing risk management procedure;
 - (ii) facilitate exchange of experts and experience (seminars, workshops).

13. Section 3 provides specific provisions on evaluating the collaboration along the duration: contact points, changes communicated in writing, annual coordination meetings.

14. In practice, no annual meetings took place, and the various works, commitments or services have been performed smoothly without any communication problem.

IV. Duration

15. No specific duration is mentioned in the MoU, but JRC is appointed as Root Certification Authority for non-EU AETR countries, or AETR-RCA, until the 30 June 2012, and point 2.3 mentions that UNECE and the European Commission Services will contribute to the smooth sustainability and further development of the system after 30 June 2012. Moreover, in section 5, JRC is recognized as the single interoperability certification laboratory. There is no specific deadline associated with this recognition.

16. All this may be interpreted in different ways, but the most direct one is that the MoU expires 30 June 2012.

V. Description of ERCA services

17. ERCA services are performed for EU 27 and non-EU AETR countries in conformity with the approved ERCA Policy v2.1 - JRC Technical Notes - JRC 53429 and the Certification Practice Statement (SPI 04.178).

18. As an overall outcome of these activities, the objective of managing a European Certification Authority for the key management for the Digital Tachograph has been met, in accordance with Council Regulation 2135/98, Annex I(B), Appendix 11 requirement CSM_007, "At European level, a single European key pair (*EUR.SK and EUR.PK*) shall be generated. The European private key shall be used to certify the member State's public keys. Records of all certified keys shall be kept. These tasks shall be handled by a European certification authority, under the authority and responsibility of the European Commission".

19. The ERCA services are including:

A. MS Policy review and audit monitoring

20. This work item includes reviewing of draft national policies for compliance with Chapter 5 of the ERCA Policy. The process is iterative, and the national authorities are requested to update and improve their policies as a condition for approval. The objective of the process is to document the measures implemented in each country as appropriate to demonstrate that a comparable level of security has been achieved.

21. This work item also includes the review of subsequent modifications of the member State Policies when these modifications are related the national implementation of Chapter 5 of the ERCA Policy.

22. Finally, this work item includes monitoring and reviewing the national audit reports that need to be carried out every 2 years after the start of operation of the national authority.

B. Root key maintenance operations

23. This work item is restricted to those activities required to ensure the integrity and availability of the backup copies of the root keys. The physical process involves the insertion of the root keys contained in the physical backups into a hardware security module (HSM) and checks on the availability and the values of the backup keys.

24. The effort required for these operations is largely determined by the need to obtain the authorizations to gain access to the key backups; and the time required to set up an HSM in a secure and controlled environment to ensure the confidentiality of the root keys at all times.

C. Key certification operations

25. This work item encompasses all of the activities related to maintenance of the ERCA operations schedule, identification and authentication of key certification requests, performance of key certification operations, checks on technical system integrity (hardware and software integrity), production of key certification records and their backups.

26. The resources required for these activities are based on the assumption of 25 certification operations per year, involving the participation of staff assigned to trusted roles as required by the measures ensuring separation of duties and dual control on signing

operations. Each certification operation requires the participation of three trusted persons to ensure redundancy and availability, six trusted persons have to be nominated.

27. This work item contains a provision for consumable material (e.g. IT supplies).

D. Security management activities

28. This work item encompasses all of the activities related to internal and external auditing of the ERCA operations. This involves inspection of the audit logs, and any exceptional activities which may be initiated by the system auditors (from the JRC Site Security service) on detection or suspicion of a security breach.

E. Configuration management

29. This work item consists of all the activities required to manage the change in the configuration of the ERCA system to maintain constantly the system at an adequate level of operation and security.

F. MS Policy approval

30. The mandatory condition for ERCA to start to review formally a National Authority Policy is that the MS Authority has been identified according to the procedure specified in the ERCA Policy.

31. JRC developed a dedicated support in this context to help new non-EU AETR countries joining the Tachograph system in the preparation of their first ERCA policy document.

32. During the covered period, the following activities were carried out:

ERCA – List of the countries which have their Authority identified or updated (are reported in bold the new non-EU AETR states) (I: first semester and II second semester)

<i>Period</i>	<i>New</i>	<i>Update</i>
II-2008	Croatia and Greece.	France and Norway
I - 2009	Republic of Moldova , Belgium, Cyprus, Ireland Latvia, Romania and Switzerland.	
II-2009		Estonia, France and Republic of Moldova
I-2010	Albania, Belarus, Bosnia and Herzegovina Russian Federation, San Marino, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.	Belarus, Finland, Liechtenstein, Poland, Russian Federation and United Kingdom
II-2010	Montenegro and Serbia	Greece, Republic of Moldova, Netherlands and Spain.
I-2011	Armenia	Belgium
II-2011	Azerbaijan, Kazakhstan, Uzbekistan	Norway

ERCA – List of the countries which have National Policy Approved or updated (are reported in bold the new non-EU AETR states) (I: first semester and II: second semester)

<i>Period</i>	<i>Approved</i>	<i>Updated</i>
II-2008	Greece	Germany
I-2009	Croatia and Monaco	
II-2009		Hungary and Lithuania
I-2010	Albania, Belarus, Russian Federation and Ukraine.	Belgium and Finland
II-2010	Bosnia and Herzegovina, Republic of Moldova, The former Yugoslav Republic of Macedonia and Turkey.	The former Yugoslav Republic of Macedonia
I-2011	San Marino	Slovenia and Spain.
II-2011	Azerbaijan, Kazakhstan, Serbia	Liechtenstein, Switzerland

G. Signing Sessions

33. Sessions were held when National Authorities registered and confirmed participation by sending their trusted courier to attend the planned sessions. All session operations are carried out according to the procedure laid out in the current Security Operational Procedure (SECOP). In particular, the following material was produced for each session: ERCA logbook entry, backup CD's, integrity CD's, Intermediate CD's, update of the ERCA Operating Manager file, and depending on the result of each single signing operation, the corresponding signed requests.

34. Between 2008 and March 2012, more than 40 ERCA sessions have been performed for EU 27 and non-EU AETR countries, and no ERCA security incident is to be reported so far.

H. National authority audit reports

35. National Authorities have an obligation to provide ERCA with a summary of their audit reports, as mentioned in the ERCA policy:

36. Excerpt of ERCA Policy v.2.1 - Obligations of National Authorities:

(a) 5.3.43 The MSA audit shall establish whether the Requirements of this Section are being maintained.

(b) 5.3.44 The MSA shall perform the first audit within 12 months of the start of the operations covered by the approved policy. When an audit finds no evidence of non-conformity, the next audit may be performed within 24 months. When an audit finds evidence of nonconformity, the next audit shall be performed within 12 months.

(c) 5.3.45 The MSA shall report the results of the audit as mentioned in 5.3.43 and provide the audit report, in English, to the ERCA.

(d) 5.3.46 The audit report shall define any corrective actions, including an implementation schedule, required to fulfil the MSA obligations.

37. On the digital tachograph website, JRC maintains and records the Audit activity of the National Authorities.

I. ERCA Staff

38. On 1 January 2012, the main staff involved in the ERCA operations are: J. Bishop, J. Loeschner and M. Atkinson as Trusted Administrators, D. Landat and M. Thornton as Trusted Officers and R. Passos De Sousa and Fabio Fratino as Trusted Auditors. The ERCA Operating Manager is V. Mahieu; the ERCA Head of Unit is JP Nordvik, Head of the Digital Citizen Security Unit of the Institute for the Protection and Security of the Citizen.

J. Security management activities

39. This work item encompasses all of the activities related to internal and external auditing of the ERCA operations. This involves inspection of the audit logs, and any exceptional activities which may be initiated by the system auditors (from the JRC Site Security service) on detection or suspicion of a security breach.

40. Normal operation of ERCA produced all requested documentation and audit logs foreseen by the current Security Operational Procedures (SECOP). According to these SECOP's, this material was kept by the different ERCA trusted actors. Additionally, the ERCA Operating Manager maintained a working copy of all non-sensitive material received or produced by the ERCA operations, of which a copy is available for DG MOVE on request.

41. The auditor has carried out all verification/audition activities foreseen by the ERCA CPS.

42. No detection or suspicion of a security breach has been detected.

K. Specific Support to AETR

Support to the non EU – AETR countries (I: first semester and II: second semester)

<i>Period</i>	<i>Date</i>	<i>Place</i>	
II-2008	22 November 2008	DG TREN	Preparation of the Seminar for non EU – AETR countries organized by TAIEX in November 2008.
	4-5 November 2008	Bruxelles	TAIEX Seminar for the non EU – AETR countries.
I-2009	27 February 2009	Geneva	Meeting organized by UNECE
	21-22 April 2009	Madrid	Workshop organized by TAIEX
II-2009	20-21 July 2009	Tirana	Workshop for Albania
I-2010	26 February 2010	Geneva	Meeting organized by UNECE

VI. Description of Interoperability certification process in the DTlab

Preamble

43. The Digital Tachograph Laboratory, DTLab (Institute for the Protection and Safety of the Citizen, of the Joint Research Centre – Ispra, Italy), and according to the Requirement t of the Appendix 1B of the Annex to the AETR related to Requirements for Construction, Testing, Installation, and Inspection of the Digital Control Device used in Road Transport,^{*} is the unique laboratory assigned to perform the Interoperability tests on the Digital Tachograph devices. To perform these operations of certification, DTLab is in possession of all tachograph cards and recording equipments that have been type approved so far.

44. The following chapter describes the activities performed and the methodology in use since 2004 to deliver interoperability certificates (see sample below).



30 January 2012

Council Regulation (EC) 1360/2002
Interoperability Certificate N° JRC_DTC/89-064/071/MA01/2012

Manufacturer :	PWPW - Polska Wytwornia Papierów Wartosciowych S.A. Ul. Karczankowska 02-871 -Warszawa Poland	
Specimen under Test	Tachograph Card ver. STXX-AETR STARCOS 3.4 ID Tachograph	
Test Specification:	Interoperability Test Specification v2.2 (JRC S&T Reports: EUR 24811 EN - 2011) Interoperability of this set of tachograph cards has been demonstrated with all type of recording equipment (VU) and motion sensors (MS) in our possess.	
Vehicle Unit		Security Certificate
Aetia SMARTACH STDII v.6.11		DCSSI 2005/14 and M-2006/10
Continental Automotive GmbH - DTCCO 1381 R1.4		BSI-DSZ-ITSEC-0725-2011
intellec GmbH- EFAS-4 - version 2		BSI-DSZ-CC-0726-2012
Stoneridge Electronics AB - SE5000 Revision 7.3		BSI-DSZ-ITSEC-0739-2011
Motion Sensors		
Aetia IS2000 SMARTACH LXRY		Siemens VDO KITAS 2171
Certificate's validity until:	29 July 2012	(EC) 1360/2002 requirements 286 ¹ and 289 ²
Public web site:	http://dte.jrc.ec.europa.eu	(EC) 1360/2002 requirement 290
Remarks :	Maintenance certificate based on JRC-DTC/89-064/2011	
Technical Responsible D. Landat		Acting Head of Unit J.P. Nordvik
		

¹ Requirement [286]: The interoperability certificate is valid for six months. It is revoked at the end of this period if the manufacturer has not received a corresponding type approval certificate. It is forwarded by the manufacturer to the type approval authority of the Member State who has delivered the functional certificate.

² Requirement [289]: The type approval certificate shall be copied by the type approval authority to the laboratory in charge of the interoperability tests at the time of deliverance to the manufacturer.

^{*} European Agreement concerning the work of crews of vehicles engaged in international road transport (AETR) – ECE/TRANS/SC.1/2006/2/Add.1.

A. Performance of interoperability tests

45. In application of the terms of the Administrative Arrangement between DG MOVE and DG JRC, and the MoU in object, DG MOVE authorizes the JRC to perform interoperability tests and issue interoperability certifications for tachograph equipment according to the procedure for type approval defined in Annex I (B).

46. Interoperability tests shall be carried out according to the published specification, under a contractual agreement with the equipment supplier.

47. Equipment suppliers shall be charged for the testing work. The charge for interoperability certification shall be the same for all suppliers. The funds received shall be used for the maintenance of the testing service (e.g. hardware / software purchases or developments, including IT equipment as required by the interoperability certification web-site, etc.).

B. Work execution and deliverables

48. This activity of the DTLab consists in the specification and performance of the interoperability tests and the issuance and publication on a web-site of the associated certificates, according to the published specifications.

49. The activities foreseen are:

- execution of interoperability certification activities for equipment manufacturers under specific contractual agreements;
- update of the definition of interoperability test specification;
- daily management and maintenance of the Interoperability Certification Laboratory (including purchase of hardware, software development, hardware and software integration and testing, and validation of the test stand);
- maintenance of a set of test keys and certificates for verification of the security mechanisms;
- management of a public web-site (see <http://dte.jrc.ec.europa.eu>) where all referenced material necessary for – and results of – interoperability certification is made available;
- liaison with all pertinent national public and private bodies.

C. Change management

50. That activity includes all the tasks that need to be carried out over time to maintain hardware, software, interoperability test specifications and associated operational procedures at a constant adequate level of efficiency in consideration of hardware obsolescence and improvement of the product lines of the equipment manufacturers.

51. During the covered period, the DTLab has been sampled during the ISO 9000 certification of the Institute for the Protection and Security of the Citizen (IPSC) institute and has been certified without any ‘non-conformity’.

52. This happened in June 2011.

53. The Technical Specifications have been up-dated 2 times recently.

- Interoperability Test Specification - Vers. 2.0 - JRC S & T Reports - EUR 23061 EN – 2008 - II-2008;
- Interoperability Test Specification - Vers. 2.2 - JRC S & T Reports - EUR 24811 EN – 2011 – I-2011.

D. Type approval and role of DTLab

54. The reference used for the extract in italics below is the note *ECE/TRANS/SC.1/2006/2/Add.1*, dated 29 February 2008, and published by the United Nations Economic and Social Council, “Common Annex IB”.

[VIII. Type approval of control device and tachograph cards]

55. For the purposes of this chapter, the words “control device” mean “control device or its components”. No type approval is required for the cable(s) linking the motion sensor to the VU. The paper, for use by the control device, shall be considered as a component of the control device.

56. *Control devices shall be submitted for approval complete with any integrated additional devices.*

57. *Type approval of control devices and of tachograph cards shall include security related tests, functional tests and interoperability tests. Positive results to each of these tests are stated by an appropriate certificate.*

58. *Contracting Parties type approval authorities will not grant a type approval certificate in accordance with article 2 of the annex to the AETR as long as they do not hold:*

- *a security certificate,*
- *a functional certificate,*
- *and an interoperability certificate, for the control device or the tachograph card, subject of the request for type approval.*

59. Interoperability tests start when DTLab is in possession of the security and functional certificates.

60. *Interoperability tests are carried out by a single competent laboratory recognized at the international level.*

Currently the DTLab of the JRC Ispra

61. *The laboratory shall register interoperability test requests introduced by manufacturers in the chronological order of their arrival.*

62. *Requests will be officially registered only when the laboratory is in possession of:*

- *the entire set of material and documents necessary for such interoperability tests;*
- *the corresponding security certificate;*
- *the corresponding functional certificate.*

63. *The date of the registration of the request shall be notified to the manufacturer.*

64. When the DTLab is in possession of the required certificates and of the specimen to be tested, the test request is recorded on the dtc.jrc.ec.europa.eu website

(http://dtc.jrc.ec.europa.eu/test_requests.html) and a notification is sent to the manufacturer (see annex1).

65. *No interoperability tests shall be carried out by the laboratory, for a control device or a tachograph card that have not been granted a security certificate and a functional certificate (see Annex 3).*

66. *Any manufacturer requesting interoperability tests shall commit to leave to the laboratory in charge of these tests the entire set of material and documents which he provided to carry out the tests.*

67. *In case of new type of card to be tested, the sets of cards successfully tested will become part of the Set of Reference of the DT cards which will be use to certify the VUs.*

68. *The interoperability tests shall be carried out, in accordance with the provisions of paragraph 5 of sub-appendix 9 (see Annex 2) of this Appendix, with respectively all the types of control devices or tachograph cards:*

- for which type approval is still valid or;*
- for which type approval is pending and that have a valid interoperability certificate.*

69. *The interoperability certificate shall be delivered by the laboratory to the manufacturer only after all required interoperability tests have been successfully passed. (see Annex 4).*

70. *The interoperability certificate (see Annex 4) is then published on the dtc.jrc.ec.europa.eu website (http://dtc.jrc.ec.europa.eu/tachograph_cards_status.html). The original copy of the Certificate is then sent to the manufacturer together with three copies of the technical report.*

71. *If the interoperability tests are not successful with one or more of the control device(s) or tachograph card(s), as requested by requirement 283, the interoperability certificate shall not be delivered, until the requesting manufacturer has realized the necessary modifications and has succeeded the interoperability tests. The laboratory shall identify the cause of the problem with the help of the manufacturers concerned by this interoperability fault and shall attempt to help the requesting manufacturer in finding a technical solution. In the case where the manufacturer has modified its product, it is the manufacturer's responsibility to ascertain from the relevant authorities that the security certificate and the functional certificates are still valid.*

72. *The interoperability certificate is valid for six months. It is revoked at the end of this period if the manufacturer has not received a corresponding type approval certificate. It is forwarded by the manufacturer to the type approval authority of the Contracting Party who has delivered the functional certificate.*

73. *Any element that could be at the origin of an interoperability fault shall not be used for profit or to lead to a dominant position.*

74. *The type approval authority of the Contracting Party may deliver the type approval certificate as soon as it holds the three required certificates.*

75. *The type approval certificate shall be copied by the type approval authority to the laboratory in charge of the interoperability tests at the time of deliverance to the manufacturer.*

76. *As soon this certificate is received by DTLab, the number of the type approval is inserted on the DT website.*

77. The laboratory competent for interoperability tests shall run a public web site on which will be updated the list of control devices or tachograph cards models:

- for which a request for interoperability tests have been registered;
- having received an interoperability certificate (even provisional);
- having received a type approval certificate.

E. Tachograph cards: Classification

78. The *DTLab* started to implement in 2006 a classification of the DT cards. The classification is based on the following criteria:

- Card manufacturer;
- Answer To Reset;
- Activity length.

79. The “answer to reset”, is a sequence of bytes sent by a smart card in response to a (hardware) reset. The ATR includes various parameters relating to the transmission protocol for the smart card.

80. According the *DTLab* classification, for a given card, a change in the ATR value corresponds to a new item in the classification.

81. Card manufacturers presently on the market are:

- A - Gemalto
- B – Giesecke & Devrient
- C - Morpho (formerly Sagem-Orga);
- D – T-Systems.

F. Request for interoperability certification

82. The request regarding interoperability activities are addressed to the following mailbox: iot@jrc.ec.europa.eu.

83. Then the full process for interoperability certification consists in the following steps:

- DTLab receive the test request by e-mail and inform the manufacturer on a possible testing schedule;
- Emission of a service contract between JRC and the manufacturer:
 - (i) Preparation of quote and preparation of a draft version of the contract;
 - (ii) Acceptation of the quotation;
 - (iii) Preparation and signature of the contract.
- Reception by DTLab of the functional and security certificates;
- Reception of the devices to be tested (5 x 4 cards and 3 VUs);
- Testing of the devices;
- Editing of the interoperability certificate;
- Preparation of the technical report.

G. Digital tachograph cards: set of reference

84. The table below reports an example of a card type, with all ATR values, typical of the type approved cards which are currently in use.

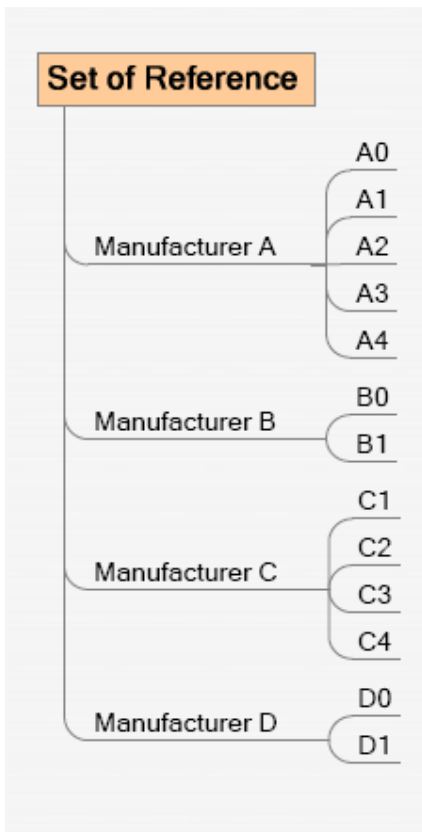
85. Answer to Reset (ATR) describes the first communication between a chip card and a card reader, after the card reader has indicated a Reset of the Card.

86. The version of the type approved cards is identifiable by the bytes of its ATR (Answer To Reset) and is a reliable criteria for the classification of the DT cards.

DRC = Driver card; WSC = Workshop card; CTC = Controller card and COC = Company card.

Class B

Class	Chip	ATR	DF Tachograph (bytes)			
			DRC	WSC	CTC	COC
B0	P8WE5032	3B BB 18 00 C0 3E 31 FE 65 47 26 44 20 54 53 4D 20 31 2E 30	23638	23568	23882	23856
	04 35	B7	12488	492	506	507
	AT90SC24036R CU Rév. B	3B DB 96 FF C0 10 31 FE 45 80 67 15 01 B4 03 00 09 00 81 05	23638	23568	23882	23856
B1	15 37	21	13776	492	520	520



Similar tables can be edited for the whole collection of cards from the set of reference.

Each set is made of the 4 cards:

- Driver CARD
- Company CARD
- Controller CARD
- Workshop CARD

The total set of reference is made of $(13 * 4) = 52$ cards to be tested.

For every new card model to be type approved, *DTLab* is requesting 5 set of 4 cards (1 for each VU, for parallel testing and one spare).

H. Digital tachograph recording equipment: set of reference

87. The set of reference of the recording equipment, VU for Vehicle unit, is made of the last type of type approved version for each VU manufacturer.

88. The following tables report all vehicle units tested. The current composition of the set of reference is indicated in bold characters.

89. Two hundred and seventy-two any modification in software or hardware of the equipment or in the nature of materials used for its manufacture shall, before being used, be notified to the authority which granted type approval for the equipment. This authority shall confirm to the manufacturer the extension of the type approval, or may require an update or a confirmation of the relevant functional, security and/or interoperability certificates.

<i>Brand</i>	<i>Model</i>	<i>Version</i>	<i>Interoperability certification</i>	
ACTIA S.A.	L2000 Digital Tachograph	P104194-100	01/06/2004	
		-All options - Light 1 - Light 2	4 July 2005	
Continental Automotive GmbH	DTCO 1381	-	8 October 2004	
		Release 1.0	27 May 2005	
		Release 1.0a	30 November 2005	
		Release 1.2	4 July 2006	
		Release 1.2a	27 July 2007	
		Release 1.3	25 November 2008	
		Release 1.3a	2 April 2009	
		Release 1.4	18 April 2011	
EFKON AG intellic GmbH (Formerly EFKON AG)	EFAS-3	Version 1.01	23 July 2008	
Stoneridge Electronics AB	EFAS-4	Version 02	13 January 2012	
		SE5000	P.N. 900208	5 April 2005
		Revision 0.2	14 July 2005	
		Revision 0.4	16 December 2005	
		Revision 7.0	16 January 2009	
		Revision 7.1	20 May 2009	
		Revision 7.3	4 April 2011	
Revision 7.4	22 March 2012			

For the motion sensors, the interoperability tests are performed using the models of *ACTIA IS2000 SMARTACH LXRY* and the model of Siemens *VDO Continental KITAS 2171*.

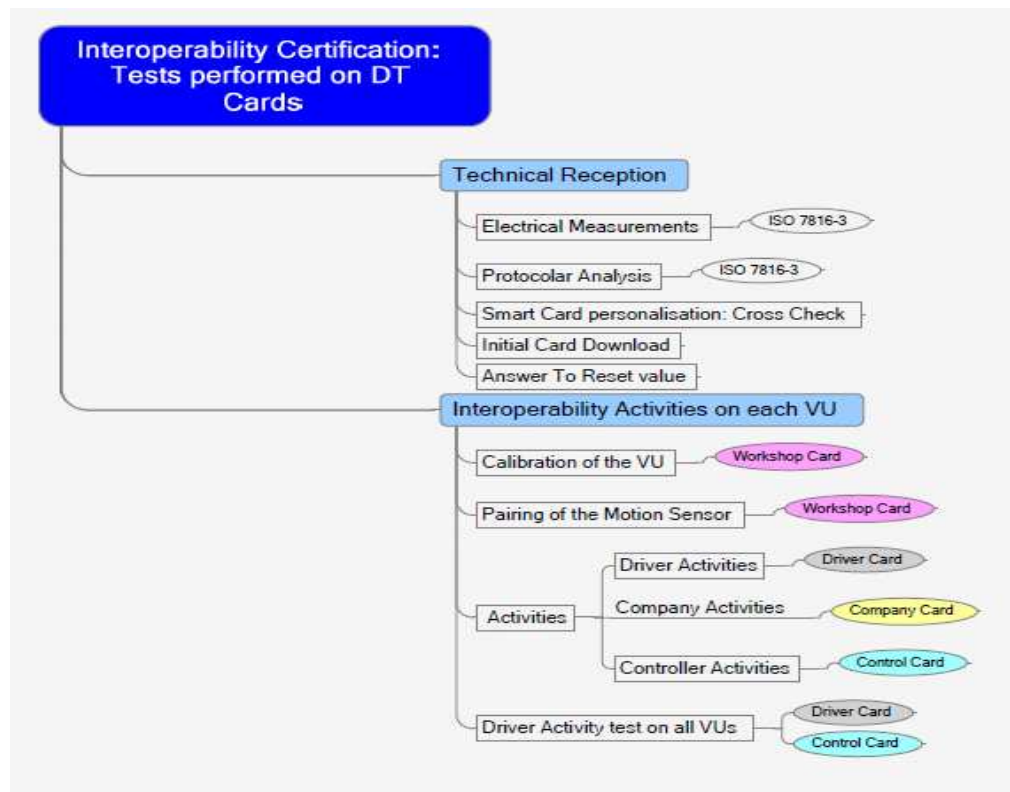
I. Description of the tests of interoperability

90. Interoperability tests are performed according the JRC Scientific and Technical report EUR 24811 EN-2011[†] - “Digital Tachograph Equipment Type Approval – Interoperability Test Specification Version 2.2”.

1. Digital tachograph cards

91. The tested cards are equipped with test keys and are normally different from the cards sent for functionality tests. For that reason, preliminary tests are performed in order to avoid any problem related to the functionality. The compatibility of the cards with ISO Standard 7816-3 is also tested. This standard is the generic standard for smartcard equipped with a chip.

92. For the certification, 4 sets of cards are used, one for each recorder.



2. Technical reception

93. The following operations/tests are performed before starting interoperability specific tests

- Check of the card personalisation; Certificates integrity, dates, etc...
- Check compatibility with ISO 7816-3:
 - Electrical measurements;

[†] To be updated before December 2012.

- Protocolar analysis.
- Labelling and identification of the cards;
- Initial download of all cards received;
- Classification of the specimens to be tested according DTLab criterions:
 - Analyse of the Answer To Reset value;
 - Determination of the activity structure length.

3. Interoperability testing

94. The following operations are performed on all four VUs of the set of reference using four sets of cards.

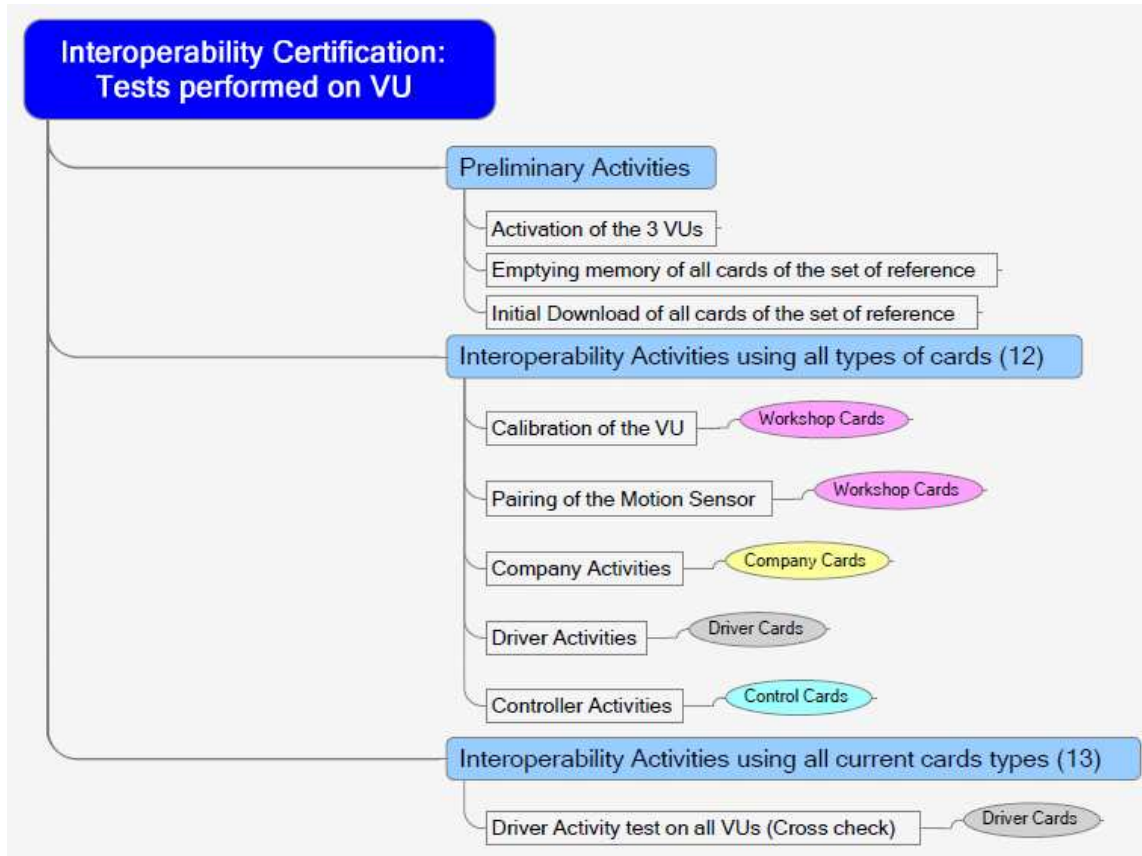
95. The correctness of the operations performed is, when possible, checked on the ticket issued by the recorder, in the content of the VU memory and in the content of the Elementary *Files* (EF) of the DT cards.

- Calibration of the recorder – use of the workshop card - The calibration consists in using a dedicated device/tool to introduce parameters into the recorder. w, l and k factors are introduced and some parameters are changed at any new calibration:
 - Vehicle Registration Number – VRN;
 - Vehicle Identification Number – VIN;
 - Tyres dimension;
 - Maximum speed limit;
 - Vehicle registering Contracting Party.
- Pairing with the motion sensor – use of the workshop card – Pairing is performed with a dedicated device/tool, excepted for the SE5000 where pairing is performed automatically when a new motion sensor is detected.
- Company activities – use of the company card – lock-in and lock-out functions are tested.
- Driver activities – use of the driver card – different driving activities are simulated using a dedicated simulator.
- Controller activities – use of the control card – during the driver activities a control card is inserted.
- Driver activity cross check – use of a driver card – the data recorded on one of the VUs must be correctly read by the three other ones.
- Overwriting of the EF_Driver_Activity_Data – use of a driver card – when this file is almost full, check the process of the overwriting operation. This test is currently under development and will be implemented soon.

4. Duration of the CARDS certification exercise

96. The execution of all tests, preliminary tests included, is normally performed in 2½ working days. The preparation and the publishing of the technical report required additional 2 working days. End of March 2012, sixty-four (64) card interoperability certificates have been issued by the DTLab.

5. Digital tachograph recorders (VU)



6. Interoperability activities

97. The certification of recording equipment (VU) requires the use of all type approved DT cards (set of reference) and any operation reported here below has to be performed with each card. Presently the set of reference is made of thirteen (13) types of cards.

- Calibration of the recorder – use each workshop card - The calibration consists in using a dedicated device/tool to introduce parameters into the recorder. w, l and k factors are introduced and some parameters are changed at any new calibration:
 - Vehicle Registration Number – VRN;
 - Vehicle Identification Number – VIN;
 - Tyres dimension;
 - Maximum speed limit;
 - Vehicle registering Contracting Party.
- Pairing with the motion sensor – use each workshop card – Pairing is performed a dedicated device/tool, excepted for the SE5000 where pairing is performed automatically when a new motion sensor is detected.
- Company activities – use each company card – lock-in and lock-out functions are tested.

- Driver activities – use each driver card – different driving activities are simulated using a dedicated simulator.
- Controller activities – use each control card – during the driver activities a control card is inserted.
- Driver activity cross check – use of some driver cards – In this test the most recent and diffused types of cards, six (6), are used. Driver activities are generated on the equipment under test, then the driver card is inserted into the four recorders of the set of reference. The data recorded by the specimen must be recognized correctly by the four VUs.
- Overwriting of the EF_Driver_Activity_Data – use each driver card – when this file is quite full, check the process of the overwriting operation. This test is currently under development and will be implemented soon.

7. Duration of the VU certification exercise

98. The execution of all tests, preliminary tests included, is normally performed in 3 1/2 working days. The preparation and the publishing of the technical report requires an additional 3 working days. End of March 2012, twenty (20) VU interoperability certificates have been issued by the DTLab.

8. Editing the public information related to the interoperability activities

99. According to the Regulations EC N° 1360/2002 and EU No. 1266/2009 (adaptation to the Council Regulation (EEC) No. 3821/85) the laboratory assigned to perform the interoperability certification has to publish and maintain the following information:

- List of the requested tests - http://dtc.jrc.ec.europa.eu/test_requests.html
- List of Interoperability certificates issued by the DTLab:
 - Recorders: http://dtc.jrc.ec.europa.eu/vehicle_units_status.html;
 - Cards: http://dtc.jrc.ec.europa.eu/tachograph_cards_status.html;
- List of the manufacturers codes (Appendix I Chapter 2, Section 2.67) - http://dtc.jrc.ec.europa.eu/manufacture_codes.html;
- List of nation codes: http://dtc.jrc.ec.europa.eu/nations_codes.html;
- Printout test specification:
http://dtc.jrc.ec.europa.eu/printout_test_specifications.html.

VII. A possible multiplication of the interoperability laboratory

100. The previous sections demonstrate that the need to have the interoperability in a single laboratory, possibly independent from any national interest is justified : procedures and test equipments must be unified, and must use a single set of reference equipment, which is precisely constituted from the accumulation of equipment certified (cards and units). Every time e.g. new cards are type approved, and as explained before, JRC asks for 4 sets of 4 DT cards (one for each DT manufacturers, in order to performed tests in parallel).

101. In order to possibly open the interoperability certification to other laboratories, various scenarios should be envisaged.

102. The following options have been identified (SC=Scenario):

SC1

103. Equivalent to a status quo. The tests and the DTlab continue in JRC ISPRA, but the costs are shared between the users. The MS of non-EU AETR countries will be asked to contribute to the running costs of the DTlab.

SC2

104. In this scenario, the single interoperability lab remains in Ispra, but becomes the laboratory of the entire DT community, with a new identification and image: e.g. Joint UN-ECE / EU-Commission interoperability lab for the Tachograph System. In complement to this, the current JRC team would be extended and open to external actors, to possibly host experts from non EU-AETR countries.

SC3

105. In this scenario, a new single lab is created, following an open procedure based on a call for tender, with precise specifications and obligations for the candidate labs. When identified, the JRC team will be involved in the knowledge and reference equipment transfer.

SC4

106. The idea here is to create multiple interoperability labs. As mentioned before, the difficulty here is to ensure a full equivalence between the labs. Cross validation exercises will be necessary. And a transition period will be needed to create the new and multiple reference equipments. For the cards, a minimum of 5 years is necessary (driver cards expiry time) before having new labs operational. Here the JRC can play important roles: creation of new set of reference equipments (by requesting additional sets of 4 DT cards), training of new labs crew, or cross validation campaigns. It is to be noted that the SC 2 here before could be a transitory option until the new interoperability labs are up and running.

107. Additional constraints will have to be managed:

- Centralization of the information and certificates in a centralized repository (website). Establishment of a Management board and edition of rules for conflicts resolution;
- Regular cross validation to ensure certification equivalence.

VIII. Conclusions

108. This note depicts the large spectrum of activities performed in the frame of this MoU between EU Commission MOVE and JRC services, on one part, and the UNECE on the other part.

109. While the idea to change the term of the MoU is accepted and understood, the technical and budgetary constraints of the operation should be kept in mind.

110. The running costs of the ERCA services are currently covered by DG MOVE budget (in the context of an Administrative Arrangement between MOVE and JRC) and for the DTlab, the budget is mainly provided by DG MOVE budget, with a complement coming from industry paying each certification at 'real costs' compensation level. The current fixed costs for industry are:

- 5,200 EUROS for maintenance interoperability testing on cards (new personalisation of existing type approved cards);
 - 10,000 EUROS for full cards interoperability testing;
 - 12,500 EUROS for Vehicle Unit interoperability testing.
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