RADIO SYSTEM COMPATIBILITY

ADIF & ADIF-AV

Version: V7.1

Date: 09/10/2024

CHANGE CONTROL

DATE	VERSION	CHANGES
16/01/2020	V1	First version
20/02/2020	V2	Elimination of RSC type 3 as not applicable to any line in service Redefinition of RSC types in order to provide only one type per line in RINF
20/07/2020	V3	Update of existing HW&SW configurations: all lines with HW&SW configurations 1 and 2 have been migrated to configuration 3. So, every line with RSC type identifiers "RSC-ES-01" and "RSC-ES-02" are updated to "RSC-ES-03". Configuration ids 1 and 2 and RSC types "RSC-ES-01" and "RSC-ES-02" are maintained unused and Configuration ids 3 and 4 and RSC type identifiers "RSC-ES-03" and "RSC-ES-04" are not renamed to keep coherence with previous versions of this document
06/04/2021	V4	1. New radio configuration, and new RSC type id. 2. Elimination of reference to line HSL Figueras-Perpignan as it is a line which is not managed neither by ADIF nor ADIF-AV, although GSM-R core network services are provided by ADIF-AV to this line 3. Lines updated 4. Added reference to new BSS SW version: Kontron V18 pc6, although it doesn't generate a new RSC type as it doesn't include any change on air interface (stated by supplier) 5. Update of contact details to request execution of tests
06/10/2021	V5	1. Added reference to BTS-R 2. Lines updated 3. Review of test cases numbering based on 0-3001 v2.0.0 4. Dynamic tests for EDORs
07/02/2022	V6	1. Included clarification on the reason to add dynamic EDORs tests 2. Lines updated, including RSC ID for voiced and data 3. Included clarification on the possibility of using ESC tests as a demonstration of EDORs tests.
31/03/2022	V6.1	1. Configuration table: Configuration ID 5: "Multiradio" replaced by "Flexi EDGE BTS & MultiRadio" 2. Lines table: "HSL Plasencia-Cáceres-Badajoz-Frontera / 3 / RSC-ES-03-V /

		RSC-ES-03.PLACACBAD-D" , replaced by: "HSL Plasencia-Cáceres-Mérida-Badajoz-Frontera / 5 / RSC-ES-05-V / RSC-ES-05.PLACACBAD-D" 3. Lines table: "CL Plasencia-Casar / 3 / RSC-ES-03-V / N/A" , replaced by: "CL Plasencia-Casar / 5 / RSC-ES-05-V / N/A" "CL L´Hospitalet de Llobregat – Mataró / 3 / RSC-ES-03-V / RSC-ES-03.HOSMAT-D" , replaced by: "CL L´Hospitalet de Llobregat – Mataró / 5 / RSC-ES-05-V / RSC-ES-05.HOSMAT-D" Line "CL Mérida-Badajoz" included.
03/05/2023	V7	1. New Lines included: CL L´Hospitalet – Port Aventura, CL Manresa – Sants- Vilanova – Sant Vicenç de Calders, CL Manresa-Lérida, CL Torralba-Soria, CL Bif.Aranda-Aranda, CL Bif.Utrera-Fuente de Piedra, CL Ávila-Salamanca, CL Zafra-Los Rosales, CL Zafra-Huelva, CL Zafra-Llano de la Granja. 2. RSC types for data reviewed based on the experience gained during the last years. Specific types only for lines where problems with certain EDORs have been detected. Rest of the lines have been applied a general type. All of this, in order to minimize and simplify the number of compatibility test necessary. 3. Update of references to 0-3001-1 and 0-3001-2 documents to the latest versions published in UIC website. 4. Voice test cases reviewed in order to eliminate test cases which are equivalent to others or not related with the integration with the network: 4.1.1. System boot, 4.6.1. Registration of train data (to functional number in use), 4.8.8. Outgoing PTP call – controller (to 1300), 4.9.2. Incoming voice group call – "other drivers in the area" (priority 0). 5. EDOR Test Cases updated in order to test in nominal conditions. 6. References to lines updated including further details, identifying lines with track ids (Annex 1).

09/10/2024	V7.1	New lines included: HSL La Sagrera AV Station, CL Portbou Station & CL Irún Station

1. INTRODUCTION

In the Commision Implementing Regulation (EU) 2019/776 of 16 May 2019 amending Commision Regulations (EU) No 321/2013, (EU) No 1299/2014, (EU) No 1301/2014, (EU) No 1302/2014, (EU) No 1303/2014 and (EU) 2016/919 and Commision Implementing Decision 2011/665/EU as regards the alignment with Directive (EU) 2016/797 of the European Parliament and of the Council and the implementation of specific objectives set out in Commission Delegated Decision (EU) 2017/1474, the following is stated:

6.1.2.5. Requirements for Radio System Compatibility. The Agency shall set up and manage in a technical document the set of checks to demonstrate the technical compatibility of an on-board subsystem with the trackside subsystem. Infrastructure Managers, with the support of the GSM-R suppliers for their network, shall submit to the Agency the definition of the necessary checks (as defined in 4.2.17) on their network by 16 January 2020 at the latest. Infrastructure Managers shall classify their lines according to RSC types for voice and, if applicable, ETCS data in RINF. Infrastructure Managers shall submit to the Agency any changes on the referred checks for their network.

In order to fulfill with the request '*Infrastructure Managers, with the support of the GSM-R suppliers for their network, shall submit to the Agency the definition of the necessary checks (as defined in 4.2.17) on their network by 16 January 2020 at the latest.'*, ADIF & ADIF-AV have prepared this document, accordingly with the draft version of the CCS TSI Application Guide received for comments.

2. Radio System Compatibility (RSC) in ADIF & ADIF-AV

Based on experience, ADIF & ADIF-AV consider that the RSC in its GSM-R network must be based on the execution of the same set of tests for each existing network configuration (hardware (HW) and software (SW)) and radio equipment, ensuring the technical compatibility between the different HW, SW versions of the on-board and on-track subsystems (cab-radio/EDOR and GSM-R network, respectively). It is considered that the GSM-R network includes the dispatching system. So, as there is only one CORE network (NSS) for the whole GSM-R network, RSC types are defined for each BSS configuration, and the tests should be performed with each dispatching system in each BSS configuration, for those tests that involve a dispatcher as originator or receiver of calls.

As it is a matter of testing the compatibility between elements based on HW and SW versions, independently on the characteristics of the railway track, speed or any other operating condition, the tests could be performed in premises provided by ADIF & ADIF-AV, where the different network configurations would be available, enabling the execution of the tests for all the necessary conditions. Whenever a certain configuration is not available in laboratory or a railway operator is not able to take a cab-radio/EDOR to this laboratory for testing, ADIF & ADIF-AV will collaborate to perform these tests in the railway lines where the different HW/SW versions to test are available, in the time slots when the tests can be performed without any impact on the railway operations. This applies for cab-radio testing, but not for EDORs testing, as **EDORs must always be tested in dynamic conditions under real operation conditions and at commercial speed**[1].

For railway operators, in order to request for testing, these are the contact details:

- High Speed Lines (ADIF-Alta Velocidad): follow instructions indicated in ADIF-Alta Velocidad web page (www.adifaltavelocidad.es -> Products and services / Request for infrastructure testing).

- Conventional Lines (ADIF: follow instructions indicated in ADIF web page (www.adif.es -> Products and services / Request for infrastructure testing).

The set of tests to be perfomed in every case are stated in the chapter TEST LIST of this document, where the definition and criteria to pass each test are provided. Basically, the target is to test the basic functionalities provided by the GSM-R network to users in order to fulfill the required operations: attachment to the network, registration/deregistration to functional numbers, and

[1] In previous versions of this document, EDORs tests could be executed in static conditions. But based on EDOR's behaviour detected in dynamic conditions, EDORs tests must be executted in dynamic and real operation conditions.

making and receiving point-to-point calls, group calls, railway emergency calls and data calls. **The success of the establishment and reception of calls must be tested against every dispatching system**. It is considered that documentary evidences are not sufficient to perform the check, so the specific tests are strictly needed for it.

All tests can be performed at cab-radio/EDOR (IC) level, taking into account its HW, SW and FW versions. So, the tests should be performed for each cab-radio/EDOR manufacturer, HW version, SW version and FW version, unless the manufacturer certifies that different versions do not imply any change for the implementation of the functionalities to test (for example, there is no need to test a new SW version if it only has changes in the DMI representation, with no change at functional and communications levels), under the responsibility of the railway operator.

The results for a cab-radio/EDOR supplier/HW/SW/FW versions will be considered applicable to every train equipped with those devices, not requiring the testing for each train or type of train.

After every cab-radio/EDOR validation, the company that requested the tests will provide to ADIF a report summarizing the results of the tests, for information, specifying HW/SW/FW versions tested and the results for each test. This information of the equipment tested and RSC type could be published in ADIF/ADIF AV websites in case this company allows ADIF/ADIF AV to do so, in order to promote a collaborative relationship between companies. ADIF/ADIF AV considers that the validation of a certain cab-radio/EDOR by one company can also apply to others not requiring new tests, although CCS TSI regulations must be taken in consideration.

Tests on lab and on track are considered valid, as well as the analysis of previous calls which could have been made in the network. ADIF/ADIF AV will facilitate those data in raw format for its analysis to the company validating an equipment, in case they are available.

In case an update takes place in the existing infrastructure affecting the radio interface (for example, as a renewal), lines updated will change their RSC types to another existing one, or new RSC types will be defined. In order to revalidate on-board equipments, ADIF/ADIF AV will contact companies affected, in order to validate equipments with the new infrastructure prior to the update of the infrastructure, so avoiding times when on-board equipments wouldn't be validated with the new infrastructure. Revalidation will NOT be necessary in case an on-board equipment has already been validated with the RSC types applied to the renewed line.

The tests are necessary for every cab-radio/EDOR, and not just for devices with a certain set of specifications.

The number of scenarios on which each one of these tests have to be performed, is based on the different BSS network configurations which are available nowadays in ADIF & ADIF-AV's GSM-R

network, depending on network elements suppliers (NOKIA and KONTRON, up today) and HW/SW versions:

CONFIGURATION ID	SUPPLIER	HW BSS (BTS)	HW BSS (BSC/TRAU)	SW BSS (System Release)
3	NOKIA	BS40, BS240, BS240-II, BS240-II B & Flexi EDGE BTS	Flexi BSC	RGR40 MP9
4	KONTRON	BTS8000, BTS9000 & BTS-R	BSC3000	v.18P&C5 or V.18P&C6
5	NOKIA	Flexi EDGE BTS & MultiRadio	Flexi BSC	RGR50

Note: Configuration ids 1 and 2 defined in the previous versions of this document are not in service in the network at the moment, but configuration ids 3 and 4 are not redefined as 1 and 2 in order to keep coherence with previous versions of this document.

So, it has to be demonstrated that every cab-radio/EDOR (Supplier/Model/HW/SW/FW) is compatible with each RSC type of the GSM-R infrastructure of the lines it is going to run.

In the following table, the lines where GSM-R is available in ADIF & ADIF-AV's network are assigned the configuration id from the previous table according to the BSS configurations available. In the case in a line there was a double layer configuration and each layer had a different network configuration, two configuration ids would be indicated (this is not the normal case, but it can happen when a network upgrade is ongoing and both layers are not updated simultaneously). Also, **in the case of double layer configuration, tests must be performed on each layer, even if both of them have the same configuration id**. Based on this, the following RSC Type Identifiers are defined:

LINE	CONFIGURATION/S ID/S	RSC TYPE VOICE	RSC TYPE DATA
HSL Albacete-Alicante	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL Antequera-Granada	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL Atocha-Chamartín	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL Barcelona-Figueras-Frontera	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL Córdoba-Málaga	3	RSC-ES-03-V	RSC-ES-03.SPECIFIC-D
HSL Granada-Cambiador	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL La Encina-Xátiva-Valencia	4	RSC-ES-04-V	RSC-ES-04.GENERAL-D
HSL La Sagra-Toledo	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL León-La Robla-Pola de Lena	5	RSC-ES-05-V	RSC-ES-05.GENERAL-D
HSL Madrid-Barcelona	3	RSC-ES-03-V	RSC-ES-03.SPECIFIC-D
HSL Madrid-Segovia-Valladolid	3	RSC-ES-03-V	RSC-ES-03.SPECIFIC-D
HSL Madrid-Sevilla	3	RSC-ES-03-V	N/A
HSL Monforte-Beniel-Murcia	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL Motilla del Palancar-Valencia-Albacete	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL Olmedo-Zamora-Pedralba	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL Orense-Santiago	4	RSC-ES-04-V	RSC-ES-04.GENERAL-D
HSL Pedralba-Taboadela-Orense	5	RSC-ES-05-V	RSC-ES-05.GENERAL-D
HSL Plasencia-Cáceres-Mérida-Badajoz-Frontera	5	RSC-ES-05-V	RSC-ES-05.GENERAL-D
HSL Torrejón de Velasco-Motilla del Palancar	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL Valladolid-León-Burgos	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL Vilaseca-Tarragona	3	RSC-ES-03-V	RSC-ES-03.GENERAL-D
HSL Zaragoza-Huesca	3	RSC-ES-03-V	N/A
CL Aranjuez-Villalba	4	RSC-ES-04-V	RSC-ES-04.GENERAL-D
CL Buñol-Utiel	5	RSC-ES-05-V	N/A
CL Bobadilla-Ronda	4	RSC-ES-04-V	N/A
CL Cercanías Bilbao (Abando – Santurzi, Desertu-Barakaldo – Muskiz, Abando – Ortuña)	4	RSC-ES-04-V	N/A
CL L´Hospitalet de Llobregat – Mataró	5	RSC-ES-05-V	RSC-ES-05.GENERAL-D

CL Humanes-Monfragüe	4	RSC-ES-04-V	N/A
CL Plasencia-Casar	5	RSC-ES-05-V	N/A
CL Mérida-Badajoz	5	RSC-ES-05-V	N/A
CL L´Hospitalet – Port Aventura	5	RSC-ES-05-V	RSC-ES-05.GENERAL-D
CL Manresa – Sants- Vilanova – Sant Vicenç de Calders	5	RSC-ES-05-V	RSC-ES-05.GENERAL-D
CL Manresa-Lérida	4	RSC-ES-04-V	N/A
CL Torralba-Soria	4	RSC-ES-04-V	N/A
CL Bif.Aranda-Aranda	4	RSC-ES-04-V	N/A
CL Bif.Utrera-Fuente de Piedra	5	RSC-ES-05-V	N/A
CL Ávila-Salamanca	5	RSC-ES-05-V	N/A
CL Zafra-Los Rosales	5	RSC-ES-05-V	N/A
CL Zafra-Huelva	5	RSC-ES-05-V	N/A
CL Zafra-Llano de la Granja	5	RSC-ES-05-V	N/A
CL Brazatortas-Villanueva de la Serena	4	RSC-ES-04-V	N/A
HSL La Sagrera AV Station	5	RSC-ES-05-V	RSC-ES-05.GENERAL-D
CL Irún Station	4	RSC-ES-04-V	N/A
CL Portbou Station	4	RSC-ES-04-V	N/A

Note 1: HSL – High Speed Line; CL – Conventional Line

Note 2: Configuration ids 1 and 2 are not in use in the network at the moment, due to network updates since the previous version of this document, so RSC type identifiers previously assigned to them: "RSC-ES-01" for lines with configurations 1&3 and "RSC-ES-02" for lines with configurations 2&3, are not used anymore. They will be maintained unused for coherence with previous versions of this document. It is not necessary to retest equipment previously tested for these configurations as they were already tested with the existing HW&SW configurations.

Note 3: When an EDOR demonstrates compatibility with any line of type RSC-ES-XX.SPECIFIC-D, then compability is also demonstrated for the rest of lines of type RSC-ES-XX.GENERAL-D, not requiring extra tests to demonstrate compatibility with those lines.

3. TEST LIST

3.1. CAB-RADIO

It is considered that the following test cases stated in document "0-3001-1 Test specifications for GSM-R related requirements: Part 1: Cab Radio version 1.1.0" must be performed in each network layer and for each of the configurations included in the RSC Type, accordingly with the definitions and expected results indicated in that document. Adaptations of these tests to the ADIF & ADIF-AV's GSM-R network will be done when necessary:

Registration/deregistration:

4.6.1. Registration of train data

4.6.6. Deregistration of train number

4.6.8. Forced de-registration (requires SIM card activation)

Point to Point Calls:

4.8.1. Incoming PTP call with eMLPP <4> and with no functional identity (not applicable Step 1b and 1c)

4.8.2. Incoming PTP call with eMLPP <4> and with train functional identity

4.8.4. Incoming call with eMLPP <0-3>

4.8.8. Outgoing PTP call – controller (To 1200)

Group Calls (VGCS):

4.9.1. Incoming voice group call (GID 200)

Voice Broadcast Calls (VBS):

4.11.1. Incoming voice broadcast call (GID 200)

Railway Emergency Calls (REC):

4.13.1. Incoming railway emergency call

4.13.2. Outgoing railway emergency call (not applicable Step 1a and 1c)

Short Messages (SMS):

4.7.1. Sending a text message using SMS teleservice

4.7.2. Receiving a text message using SMS teleservice

NOTE: In case cab-radio tests have been carried out with a previous version of this document, these tests will go on being considered valid. So, if they were done for a certain voice RSC type, they will be considered valid for existing or new lines of the same type. Nevertheless, once in service conditions, any problem detected should be communicated to ADIF, in order to evaluate if new specific RSC types are necessary, to verify that the cab-radios integrate correctly with the infrastructure.

3.2. EDOR

It is considered that the following test case stated in document "0-3001-2 Test specifications for GSM-R related requirements: Part 2: EDOR version 1.1.0" must be performed in nominal conditions for each one of the configurations included in the RSC Type, accordingly with the definitions and expected results indicated in that document for testing:

6.2.7. Data call – transparent 4800 bps (V.110)

These tests must include 4 trips in both directions at commercial speed (A->B, B->A, A->B, B->A, A->B, B->A, A->B & B->A). These tests will be made in nominal conditions. So, in the case of double coverage, both layers will be on air.

For the RSC-ES-XX.GENERAL-D types, tests must be executed on a track with a minimum length of 50 kilometres.

For the RSC-ES-XX.SPECIFIC-D types, tests must be executed in one of the following tracks:

- HSL Madrid-Segovia-Valladolid: Tres Cantos – Segovia (PPKK 17 – PPKK 68).
- HSL Córdoba-Málaga: Antequera – Málaga Los Prados (PPKK 97 - PPKK 154).
- HSL Madrid-Barcelona: Medinaceli -Calatayud (PPKK 177 - PPKK 255).

When compatibility is demonstrated in any one of these three lines, it will apply for the three of them. Also, when an EDOR demonstrates compatibility with any line of type RSC-ES-XX.SPECIFIC-D,

then compability is also demonstrated for the rest of lines of type RSC-ES-XX.GENERAL-D, not requiring extra tests to demonstrate compatibility with those lines

If ESC tests include the test cases described before, those ESC tests could also be used as a demonstration of this test.

Tests will be considered successful in case no drop call takes place due to EDOR reasons. Drop calls due to infrastructure failures will not be taken into consideration.

NOTE: In case EDOR tests have been carried out with versions V5, V6 or V6.1 of this document, these tests will go on being considered valid. Also, if they were done in a line which is now considered as type RSC-ES-XX.GENERAL-D, the previous results will now apply to all lines categorized as type RSC-ES-XX.GENERAL-D, not requiring new tests for these lines. Nevertheless, once in service conditions, any problem detected should be communicated to ADIF, in order to evaluate if new specific RSC types are necessary, to verify that the EDORs integrate correctly with the infrastructure.

4. ANNEX I. TRACK IDs

HSL Albacete-Alicante:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
042	Albacete-Los Llanos	321,1	Alacant-Terminal	486,0

HSL Antequera-Granada:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
014	Bif Gobantes	0,0	Bif Bobadilla	9,0
036	Antequera-Santa Ana	96,8	Granada	211,0

HSL Atocha-Chamartín-Torrejón de Velasco:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
040	Madrid-Chamartín	0,0	Bif. Torrejón de Velasco	35,9

HSL Barcelona-Figueras-Frontera:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
050	Barcelona-Sants	621,0	Límite ADIF-LFPS	752,4
280	Bif Mollet	2,5	Bif Nudo Mollet	0,0
298	Girona-Mercaderíes	202,6	Bif Girona-Mercaderies	202,0

HSL Córdoba-Málaga:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
030	Bif Málaga-AV	0,0	Málaga María Zambrano	154,5
032	Antequera-Santa Ana	0,0	Cambiador Antequera	0,4

HSL Granada-Cambiador:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
036	Cambiador Granada	55,9	Cambiador Granada	56,0
061	Bif Maracena	53,3	Cambiador de Granada	53,7
062	Cambiador de Granada	53,7	Bif Almanjayar	54,3

416	Cambiador Granada	53,0	Cambiador Granada	55,9

HSL La Encina-Xátiva-Valencia (*):

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
TBD				

(*) Line in construction. Data not available in this moment

HSL La Sagra-Toledo:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
020	La Sagra	53,7	Toledo	20,8

HSL León-La Robla-Pola de Lena:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
130	León	122,6	Bif Galicia	124,3
130	Bif Galicia	1,0	Bif Pajares	21,0
984	Bif Pajares	367,2	Pola de Lena	416,8

HSL Madrid-Barcelona:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
012	Madrid-Puerta de Atocha	0,0	Cambiador Atocha	1,3
018	Bif Cerro Negro/Sta Catalina	0,0	CTT Cerro Negro AV	0,3
050	Barcelona-Sants	621,0	Madrid-Puerta de Atocha	0,0
052	Cambiador Plasencia de Jalón	276,7	Bif Cambiador Plasencia de Jalón	272,9
054	Bif Canal Imperial	320,8	Bif Moncasi	295,6
056	Bif Artesa de Lleida	451,1	Bif Les Torres de Sanui	434,7
060	Bif Cambiador Zaragoza-Delicias	305,3	Cambiador Zaragoza-Delicias	304,9
068	Vallecas AV-Aguja Km. 12,300	0,0	Los Gavilanes-Aguja Km. 13,400	5,6

HSL Madrid-Segovia-Valladolid:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
072	CTT Fuencarral AV	1,7	Cambiador Madrid-Chamartín-Clara Campoamor	1,4
076	Cambiador Valdestillas	160,9	Bif Cambiador Valdestillas	159,9

080	Madrid-Chamartín Clara Campoamor	0,5	Valladolid-Campo Grande	179,3
190	Cambiador Medina AV	156,6	Medina del Campo AV	155,5

HSL Madrid-Sevilla:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
010	Madrid-Puerta de Atocha	0,0	Sevilla-Santa Justa	470,5
016	Majarabique	460,4	Cambiador Majarabique	462,5
022	Cambiador Alcolea	0,0	Bif Cambiador Alcolea	0,7
024	Yeles Aguja Km. 34,397	5,7	Bif Blancales	0,0

HSL Monforte-Beniel-Murcia:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
046	Bif Murcia	461,4	El Reguerón-Aguja Km. 522,1	522,1
048	Bif Vinalopó	462,5	Monforte del Cid AV	464,7
354	El Reguerón-Aguja Km. 522,1	522,1	Murcia del Carmen	529,2

HSL Motilla del Palancar-Valencia-Albacete:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
040	Bif. Albacete	248,100	Valencia-Joaquín Sorrolla	396,8
042	Bif Albacete	248,1	Albacete-Los Llanos	321,1
044	Bif Joaquín Sorolla-UIC	2,1	Bif Jesús	1,6
308	Albacete-Los Llanos	321,1	Cambiador Albacete	321,6
328	Bif Jesús-Aguja Km. 396,7	396,7	Cambiador Valencia	396,8

HSL Olmedo–Zamora-Pedralba:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
982	Bif Medina	133,9	Bif Pedralba	339,7
888	Pedralba Ag. Km. 112,4	1,1	Cambiador de Pedralba	0,0
890	Cambiador Pedralba	343,8	Bif Pedralba	339,7

HSL Orense-Santiago:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
082	Bif. Coto da Torre	1,0	Bif A Grandeira Ag. Km	85,0

			85,0	
822	Orense	248,9	Bif. Coto da Torre	249,9
822	Bif. Grandeira Ag. Km 376,100	376,1	Santiago de Compostela	378,5

HSL Pedralba-Taboadela-Orense:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
892	Cambiador Taboadela	446,5	Taboadela AV AG. Km. 446,1	446,1
894	Cambiador Taboadela	446,5	Taboadela Ag. Km. 447,1	447,1
982	Bif Pedralba	339,7	Orense	462,5

HSL Plasencia-Cáceres-Mérida-Badajoz-Frontera:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
026	Bif. San Esteban	8,5	Bif. Casa de la Torre	72,1
510	Aljucén	0	Bif Peñas Blancas	17,8
518	Bif Casa de la Torre	72,1	Bif Romanos	333,5 (señal de entrada desde V. de Alcántara)-Frontera con L502 86,4
520	Señal entrada Mérida	452,0	Badajoz (hasta Puertollano-Mercancías)	512,3
530	Monfragüe	1,7 0,4	El Chaparral	6,6
532	Monfragüe-Aguja Km. 255,4	2,7	Monfragüe-Aguja Km. 4,4	0,0
534	Bif El Chaparral	8,0	Arroyo de la Herrera	12,8
536	Bf El Chaparral	6,6	Bif San Esteban	9,2
538	Plasencia	0,4 (topera 1)	Bif San Esteban	8,5
626	Cáceres Ag 82,2	83,9	Bif Peñas Blancas	125,1 (vía 1) 125,7 (vía 2, TPM1)
926	Bif La Isla	145,6	Bif San Nicolás	177,6

HSL Torrejón de Velasco-Motilla del Palancar:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
040	Torrejón de Velasco	35,9	Bif. Albacete	248,100

HSL Valladolid-León-Burgos:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
080	Valladolid-Campo Grande	179,3	Burgos-Rosa Manzano	304,0
084	Bif Venta de Baños	217,6	León	354,4
136	Cambiador Burgos	304,7	Burgos-Rosa Manzano	304,0
158	Cambiador de Villamuriel	224,6	Bif Cerrato	222,7
170	Bif Soto	222,7	Bif Cerrato	218,2
180	Bif Estadio Municipal	344,3	Cambiador Clasificación	343,9
186	Cambiador Vilecha	339,5	Bif Cambiador Vilecha	338,9

HSL Vilaseca-Tarragona:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
640	Cambiador de La Boella	254,1	Camp de Tarragona	266,3

HSL Zaragoza-Huesca:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
070	Bif Huesca	0,0	Huesca	78,9

CL Aranjuez-Villalba:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
100	Madrid Chamartín Clara Campoamor	0,0	Villalba de Guadarrama	37,7
300	Madrid-Chamartín Clara Campoamor	0,0	Aranjuez	48,3
900	Madrid-Chamartín Clara Campoamor	7,9	Madrid Atocha Cercanías (Vía Recoletos)	0,0

CL Buñol-Utiel:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
310	Utiel	0,1	Buñol	46,0

CL Bobadilla-Ronda:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
420	Bobadilla	0,0	Ronda	70,5

CL Cercanías Bilbao (Abando - Santurzi, Desertu-Barakaldo – Muskiz, Abando – Ortuña):

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
700	Intermodal Abando Indalecio Prieto	249,2	Orduña	208,9
720	Santurtzi	13,3	Intermodal Abando Indalecio Prieto	0,0
722	Muskiz	13,0	Desertu-Barakaldo	0,0

CL L´Hospitalet de Llobregat – Mataró:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
276	Bifurcación Sagrera	105,9	Mataró	133,1

CL Humanes-Monfragüe:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
500	Humanes	22,8	Monfragüe	251,6

CL Plasencia-Casar:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
500	Mirabel	265,4	Casar de Cáceres	309,5

CL Mérida-Badajoz:

LÍNEA	ORIGEN	PK ORIGEN	DESTINO	PK DESTINO
520	Bif La Isla	464,6	Bif San Nicolás	496,6

5. ANNEX 2. CORRESPONDENCE BETWEEN RSC DATA TYPE BETWEEN VERSIONS 6.1 AND 7

LINE	RSC TYPE DATA	
	V6.1	V7
HSL Albacete-Alicante	RSC-ES-03.ALBALI-D	RSC-ES-03.GENERAL-D
HSL Antequera-Granada	RSC-ES-03.ANTGRA-D	RSC-ES-03.GENERAL-D
HSL Atocha-Chamartín	RSC-ES-03.CHATO-D	RSC-ES-03.GENERAL-D
HSL Barcelona-Figueras-Frontera	RSC-ES-03.BAFI-D	RSC-ES-03.GENERAL-D
HSL Córdoba-Málaga	RSC-ES-03.CORMAL-D	RSC-ES-03.SPECIFIC-D
HSL Granada-Cambiador	N/A	RSC-ES-03.GENERAL-D
HSL La Encina-Xátiva-Valencia	RSC-ES-04.LAXAVA-D	RSC-ES-04.GENERAL-D
HSL La Sagra-Toledo	RSC-ES-03.SAGTOL-D	RSC-ES-03.GENERAL-D
HSL León-La Robla-Pola de Lena	RSC-ES-05.LEOPOL-D	RSC-ES-05.GENERAL-D
HSL Madrid-Barcelona	RSC-ES-03.MADBCN-D	RSC-ES-03.SPECIFIC-D
HSL Madrid-Segovia-Valladolid	RSC-ES-03.MADVLL-D	RSC-ES-03.SPECIFIC-D
HSL Madrid-Sevilla	N/A	N/A
HSL Monforte-Beniel-Murcia	RSC-ES-03.MONMUR-D	RSC-ES-03.GENERAL-D
HSL Motilla del Palancar-Valencia-Albacete	RSC-ES-03.MOTVLCALB-D	RSC-ES-03.GENERAL-D
HSL Olmedo–Zamora-Pedralba	RSC-ES-03.OLMPED-D	RSC-ES-03.GENERAL-D
HSL Orense-Santiago	RSC-ES-04.ORESAN-D	RSC-ES-04.GENERAL-D
HSL Pedralba-Taboadela-Orense	RSC-ES-05.PEDORE-D	RSC-ES-05.GENERAL-D
HSL Plasencia-Cáceres-Mérida-Badajoz-Frontera	RSC-ES-05.PLACACBAD-D	RSC-ES-05.GENERAL-D
HSL Torrejón de Velasco-Motilla del Palancar	RSC-ES-03.TORMOT-D	RSC-ES-03.GENERAL-D
HSL Valladolid-León–Burgos	RSC-ES-03.VALLEOBUR-D	RSC-ES-03.GENERAL-D
HSL Vilaseca-Tarragona	RSC-ES-03.VILTAR-D	RSC-ES-03.GENERAL-D
HSL Zaragoza-Huesca	N/A	N/A
CL Aranjuez-Villalba	RSC-ES-04.ARAVIL-D	RSC-ES-04.GENERAL-D
CL Buñol-Utiel	N/A	N/A
CL Bobadilla-Ronda	N/A	N/A
CL Cercanías Bilbao (Abando – Santurzi, Desertu-Barakaldo – Muskiz, Abando – Ortuña)	N/A	N/A
CL L´Hospitalet de Llobregat – Mataró	RSC-ES-05.HOSMAT-D	RSC-ES-05.GENERAL-D
CL Humanes-Monfragüe	N/A	N/A
CL Plasencia-Casar	N/A	N/A
CL Mérida-Badajoz	N/A	N/A
CL L´Hospitalet – Port Aventura		RSC-ES-05.GENERAL-D
CL Manresa – Sants- Vilanova – Sant Vicenç de Calders		RSC-ES-05.GENERAL-D
CL Manresa-Lérida		N/A

CL Torralba-Soria		N/A
CL Bif.Aranda-Aranda		N/A
CL Bif.Utrera-Fuente de Piedra		N/A
CL Ávila-Salamanca		N/A
CL Zafra-Los Rosales		N/A
CL Zafra-Huelva		N/A
CL Zafra-Llano de la Granja		N/A
CL Brazatortas-Villanueva de la Serena		N/A