UNISIG

ERTMS/ETCS – Class 1

On-board Data Dictionary

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Company	Technical Approval	Management approval
ALSTOM		
ANSALDO SIGNAL		
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THALES		

MODIFICATION HISTORY

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Version 2.3.0 14-April-2008	All	Alignment with SRS 2.3.0. Ready for delivery	Oscar Rebollo

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1. DEPENDENCIES TABLE

It is used to include the number of features that call the feature where the table is written:

If the Test Case X of Feature Y uses the Feature Z, the table inside the file containing the Feature Z shall be completed with:

Set of Test Cases included in	
Feature	**Test Cases**
Y	X

2. STARTING AND END CONDITIONS (INTERNAL STATES)

The following information can be included in starting and end conditions (internal states).

When writing the Test Cases only the relevant information shall be included, even if it is to explain the variable or information is UNKNOWN.

- ERTMS/ETCS Level
- ERTMS/ETCS Mode
- Linking Information
- Movement Authority Information
- Mode Profile for SH/OS
- Track Description Information
- Position Reports Parameters
- MA Request Parameters
- Level Transition Information
- National Values
- Driver ID
- Radio communication session
- RBC phone number
- RBC ID
- Train Data
- Train running number

- Text Message
- List of ERTMS/ETCS Compatibility Versions
- ERTMS/ETCS Compatibility Version
- Status of Desk
- Train speed

This list is not exhaustive, so other information can be added.

Do not use any other words to include exactly the same information.

States of ERTMS/ETCS variables	Possible Values	Description
M_LEVEL	0	L 0
	1	L STM
	2	L 1
	3	L 2
	4	L 3

If more than one ERTMS/ETCS level is possible, write down:

M_LEVEL	0 / 2	L 0 / L 1

If in the End conditions, the values are the same, add the word UNCHANGED:

M_LEVEL	0 / 2 UNCHANGED	L 0 / L 1

States of ERTMS/ETCS variables	Possible Values	Description
M_MODE	0	FS
	1	OS
	2	SR
	3	SH
	4	UN
	5	SL
	6	SB
	7	TR
	8	PT
	9	SF
	10	IS
	11	NL
	12	SE
	13	SN
	14	RV

If more than one mode is possible, write down:

M_MODE	0 / 1 / 2	FS / OS / SR

If in the End conditions, the values are the same, add the word UNCHANGED:

M_MODE	0 / 1 / 2 UNCHANGED	FS / OS / SR

States of ERTMS/ETCS variables	Possible Values	Description
Linking Information	STORED UNKNOWN	
L1 Movement Authority Information	STORED UNKNOWN	
L2/3 Movement Authority Information	STORED UNKNOWN	
Mode Profile for SH	STORED UNKNOWN	
Mode Profile for OS	STORED UNKNOWN	
Track Description Information	STORED UNKNOWN	This row can be substituted and split in the next three rows if required: Gradient Profile, SSP and Axle Load Speed Profile
Gradient Speed Profile	STORED UNKNOWN	
International Static Speed Profile	STORED UNKNOWN	
Axle Load Speed Profile	STORED UNKNOWN	
Position Reports Parameters	STORED UNKNOWN	This row can be substituted and split in the variables containing Position report parameters

States of ERTMS/ETCS variables	Possible Values	Description
MA Request Parameters	STORED UNKNOWN	This row can be substituted and split in the variables containing MA request parameters
T_CYCRQST	FINITE VALUE UNKNOWN	Apart from FINITE VALUE and UNKNOWN, it can contain the precise value.
T_MAR	FINITE VALUE UNKNOWN	Apart from FINITE VALUE and UNKNOWN, it can contain the precise value.
Level Transition Information	STORED UNKNOWN	The row can be substituted and split in the next rows, containing more detailed information about level transition.
D_LEVELTR	FINITE VALUE UNKNOWN	Apart from FINITE VALUE and UNKNOWN, it can contain the precise value.
M_LEVELTR	FINITE VALUE UNKNOWN	Apart from FINITE VALUE and UNKNOWN, it can contain the precise value.
L_ACKLEVELTR	FINITE VALUE UNKNOWN	Apart from FINITE VALUE and UNKNOWN, it can contain the precise value.
National values	STORED UNKNOWN	The row can be substituted and split to detail the content of the variables with national values needed for each Test cases. If the variables are included, apart from STORED and UNKNOWN, it can contain the precise value.
...	…	…
It can be extended to any other packet.		

STORED means, the information or packet has been already received on-board.

FINITE VALUE means the real value according to the Test Cases will be used. This FINITE VALUE has been included only in the ERTMS variables defined in SRS chapter 7. Only the relevant variables shall be mentioned in the Test Cases. For these variables to define a precise value is better than to write down FINITE VALUE.

UNKNOWN: information not received

States of ERTMS/ETCS variables	Possible Values	Description
Driver ID	VALID INVALID UNKNOWN	
ERTMS/ETCS level	VALID INVALID UNKNOWN	
Radio communication session	ESTABLISHED TERMINATED MAINTAINED	
RBC phone number	VALID INVALID UNKNOWN	
RBC ID	VALID INVALID UNKNOWN	
Train Data	VALID INVALID UNKNOWN	
Train running number	VALID INVALID UNKNOWN	

VALID means validated data is stored on-board.

INVALID: the driver is required to either revalidate existing data or to modify existing data and validate the modified data.

UNKNOWN: the driver is required to enter data.

States of ERTMS/ETCS variables	Possible Values	Description
Text Message	ACKNOWLEDGED NOT ACKNOWLEDGED	

ACKNOWLEDGED means the driver has acknowledged the text message on DMI.

NOT ACKNOWLEDGED: the driver has not acknowledged.

States of ERTMS/ETCS variables	Possible Values	Description
List of ERTMS/ETCS Compatibility Versions	AVAILABLE NOT AVAILABLE	

If the list of ERTMS/ETCS Compatibility Versions is **AVAILABLE**, include in Description column the available versions.

States of ERTMS/ETCS variables	Possible Values	Description
ERTMS/ETCS Compatibility Version	COMPATIBLE NOT COMPATIBLE	

ERTMS/ETCS Compatibility Version is either **COMPATIBLE** with or **NOT COMPATIBLE** with the list of ERTMS/ETCS compatibility versions stored on-board.

States of ERTMS/ETCS variables	Possible Values	Description
Status of Desk	OPEN CLOSED	
V_TRAIN	0 ≠ 0 NO MATTER	It means: train at standstill, or train running, or train speed not relevant for Test Case

3. STARTING AND END CONDITIONS ON INTERFACES

3.1 Name of interfaces

The possible names for interfaces are:

- RTM: for the radio connection.
- TIU: train interface (brakes, pantograph, remote control signal, etc).
- DMI: driver interface
- BTM: for balise messages
- LTM: for loop messages
- JRU: Juridical Recording Unit

3.2 Direction of interfaces (I/O values)

- I Input (from the interface towards the EVC)
- O Output (from the EVC towards the interface)
- - Interface may exist or not, in any case not relevant
- Both Input and Output

3.3 State of interfaces

If more than one event is related to the same interface, include all in chronological order.

- NOT RELEVANT
- NOT AFFECTED
- Radio link CONNECTED / DISCONNECTED
- SB APPLIED / RELEASE
- EB APPLIED / RELEASE
- Remote control is DETECTED / NOT DETECTED
- Text message is DISPLAYED / NOT DISPLAYED / NOT REMOVED
- The ... button is AVAILABLE / NOT AVAILABLE
- Data / Message / Telegram is RECORDED / NOT RECORDED

Avoid the inclusion of the name of the interface in the “state of interface” column:
“An acknowledgement request for running in Staff Responsible mode is displayed on the DMI”, should be written:
“An acknowledgement request for running in Staff Responsible mode is DISPLAYED”.

State of interfaces	I/O	Interface	Comments
NOT RELEVANT	-		
NOT AFFECTED	-		

NOT RELEVANT means the Interface is active and its state is not relevant for test case.

Interface can have all possible states, without affecting the test case. ONLY APPLICABLE FOR STARTING CONDITIONS

NOT AFFECTED: Interface state is not affected by the test case (unchanged from start conditions). ONLY APPLICABLE FOR END CONDITIONS

In both cases, the I/O column is completed with "-".

State of interfaces	I/O	Interface	Comments
Radio link is CONNECTED	Both	RTM	
Radio link is DISCONNECTED	Both	RTM	

State of interfaces	I/O	Interface	Comments
SB APPLIED	O	TIU	
SB RELEASED	O	TIU	
EB APPLIED	O	TIU	
EB RELEASED	O	TIU	

If both brakes are released, write down:

SB and EB APPLIED	O	TIU	

If there is a brake intervention (i.e.: due to over-speeding), emergency brake or service brake (if available) will be applied. In this case write down:

SB or EB APPLIED	O	TIU	

If the brakes (SB or EB) are not applied during the Sequence of Test, the Starting condition for TIU is NOT RELEVANT, and the end condition is NOT AFFECTED.

State of interfaces	I/O	Interface	Comments
Remote control is DETECTED	I	TIU	
Remote control is NOT DETECTED	I	TIU	

Remote control signal is needed for SL mode.

State of interfaces	I/O	Interface	Comments
The ... message is DISPLAYED	O	DMI	
The ... message is NOT DISPLAYED	O	DMI	
The text message previously displayed is NOT REMOVED	O	DMI	

State of interfaces	I/O	Interface	Comments
The ... button is AVAILABLE	O	DMI	
The ... button is NOT AVAILABLE	O	DMI	
… is DISPLAYED	O	DMI	
... is NOT DISPLAYED	O	DMI	

The button **AVAILABLE** means the driver can select it. It does not mean the button is directly shown to the driver

State of interfaces	I/O	Interface	Comments
Data / Message ... / Telegram ... / Packet … is RECORDED	O	JRU	
Data / Message ... / Telegram ... / Packet … is NOT RECORDED	O	JRU	

DATA: upon entry/validation of data or revalidation of existing data.

PACKET: upon reception by the on-board equipment of a packet included in SRS.

MESSAGE: upon reception by the on-board equipment of a radio message from trackside.

TELEGRAM: upon reception by the on-board equipment of a balise/loop telegram from trackside

4. SEQUENCE OF TEST

- The most significant ERTMS/ETCS variables can be used.
- If a balise message or radio telegram is missed it has to be put "-" in the I/O column
- The JRU interface has to be included in the table.
- If some distance or speed information is needed, include it in the Comments column. It can also be checked in the JRU.
- If some steps are performed at the same time in different interfaces (i.e.: application of brake through TIU and the recording action of brake intervention in the JRU), it is up to you to establish the sequence order. But the value of the column step shall be the same for all of them:

SEQUENCE OF TEST					
Step	**Description of Events**	**I/O**	**Interface**	**Comments**	**Test Result**
…	…	…	…	…	
N.	The Emergency Brake is APPLIED.	O	TIU		
	The Emergency Brake intervention is DISPLAYED.	O	DMI		
	The Emergency Brake intervention is RECORDED.	O	JRU		
…	…	…	…	…	

4.1 "Use of a Feature"

If some references to other features are included in the sequence of test, it shall be done as follows:

SEQUENCE OF TEST					
Step	**Description of Events**	**I/O**	**Interface**	**Comments**	**Test Result**
…	…	…	…	…	
N.	When the entire train is in the area of higher Permitted Speed, the new Permitted Speed is DISPLAYED.	O	DMI	Use_F#287: Indication of permitted speed.	
…	…	…	…	...	

The reference shall have the format: USE_F#n: <title_of_the_feature_as_it_is_in_FeatureList>.

The “n” is the feature number.

The reference shall be written in black colour.

This type of referencing is used when one feature is included in the sequence of test as a subroutine.

4.2 “Preceded by” and “Followed by”

The aim of referencing in this way is to concatenate features. It is clear than some features cannot be tested alone, because they need the trigger of other features, or need to be followed by another feature. Concatenation of features will help to guarantee correctness and is the best alternative to avoid the work duplication.

If the preceded or followed feature could be more than one, more than one feature can be included in the dedicated row of Sequence of Test.

Only when the concatenation is necessary, the preceded and followed by shall be included. If the concatenation is not mandatory according to SRS and/or to the right behaviour of the equipment under test, the preceded and followed by rows cannot be included.

If the sequence of test of one test case is preceded by other feature, add the following in the first row:

SEQUENCE OF TEST					
Step	**Description of Events**	**I/O**	**Interface**	**Comments**	**Test Result**
Preceded by	Feature n … OR TCn of Feature m …				
…	…	…	…	…	…

If the sequence of test of one test case is followed by other feature, add the following in the last row:

SEQUENCE OF TEST					
Step	**Description of Events**	**I/O**	**Interface**	**Comments**	**Test Result**
…	…	…	…	…	…
Followed by	Feature n … OR TCn of Feature m …				

The content of the Description of Events shall include the number of the referenced feature and its name as written in the Feature List.
It can also include the number of the test cases of the feature (if they are known).
This type of referencing is used when one sequence of test is concatenated with the next sequence of test.

If there is no feature “Preceded by” or “Followed by”, the complete row shall be removed from the Sequence of Test table.

4.3 Sequence of Test table when mode / level changes

If there are mode and/or level changes during the events described in the sequence of test table, the correct table to use is:

SEQUENCE OF TEST									
Step	Previous		Description of Events	I/O	Interface	Comments	Next		Test Result
	Levels	Modes					Levels	Modes	
...	...	...	...	...	…	…	...	...	
N.	L3	FS / OS / SR / TR	Message 136: Train Position Report is SENT.	O	RTM		L3	FS / OS / SR / TR	
...	...	...	...	...	…	…	...	...	

For the step N described in the table:

1. The “Previous” column includes the mode and level before the event described in “Description of Events” column is performed.
2. The event of “Description of Events” is performed
3. The mode and level at the end of step N is included in “Next” column.

The “Previous” mode / level of step N, shall be the same as the “Next” mode / level of step N-1.

Avoid to include the word “same” in the “Previous” and “Next” column if there is no mode / level change. Instead of that, copy the list of modes / levels.

5. TELEGRAM AND MESSAGE DESCRIPTIONS

- The **<Title>** will be:
  - If it is a radio message: Step <n>: Radio message XXX – YYY ("Euroradio" instead of "Radio" is also valid)

    <n> is the step of "Sequence of Test"

    XXX is the number of the message, according SRS chapter 8. (i.e.: 3)

    YYY is the name of the message, according SRS chapter 8 (i.e.: Movement Authority)

  - If it is a balise telegram: Step <n>: Balise Group XXX – A / B

    <n> is the step of "Sequence of Test"

    XXX is the number or identification of Balise group.

    A is the order of the balise inside the group

    B is the number of balises inside the group (i.e.: 1/3, 2/3 and 3/3)

    "A / B" can be replaced by "First balise", "Second balise", etc.

- In the **Value** column:
  - Include a precise value, if it is known. (i.e.: value for NID_MESSAGE, NID_PACKET, ...)
  - FINITE VALUE, if the value will be defined after during the preparation of Test Trips, and it is strongly dependent of test track description. (L_MESSAGE, V_TRAIN, L_ACKMAMODE, ...)
  - NO MATTER, if the value is not important and does not depend on track description (i.e.: in features related to completeness, the packets inside balises are not relevant, so NID_PACKET can take any value)

The following table has been included as an example:

Step 1 : Balise Group BGa – First balise			
Variable	**Length**	**Value**	**Comment**
Q_UPDOWN	1	1	Uplink
M_VERSION	7	001 0000	Class 1
Q_MEDIA	1	0	Balise
N_PIG	3	000	1 of N balises
N_TOTAL	3	FINITE VALUE	N balises
M_DUP	2	FINITE VALUE	
M_MCOUNT	8	FINITE VALUE	
NID_C	10	FINITE VALUE	
NID_BG	14	FINITE VALUE	BGa
Q_LINK	1	1	Linked
NID_PACKET	8	NO MATTER	…
…	…	…	…

The header shall be included always with all the variables.

The relevant packets shall be included with all the variables.

The not-relevant packets do not need to be included in the description of the message / telegram.