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Zero Emission flexible vehicle platform with modular powertrains serving the long-haul Freight Eco System

ZEFES - Deliverable report

D3.3 - Conformance tests and guidelines for MCS norms

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Author(s)	Joan Carles Artigau (Applus+ IDIADA) Victor Gasanz (Applus+ IDIADA)	
Checked by	Fernando Lopez (Hitachi Energy)	30/04/2025
Reviewed by (if applicable)	Javier Iglesias (Hitachi Energy) Miguel Rodriguez (ABB)	28/04/2025
Approved by	Omar Hegazy (VUB) – Project coordinator	19/05/2025
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3.1	25/03/2025	ABB	Revision by ABB
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Project summary
Within Work Package 3 of the ZEFES project, IDIADA focuses specifically on developing conformance tests and guidelines for Megawatt Charging System (MCS) norms. This includes verification of MCS interfaces and communication layers through a carefully designed test methodology to ensure correct definition, execution, and interoperability. IDIADA has developed a test device capable of validating charging sequences and communication protocols by running specific test cases. Using interoperability protocols developed in the ASSURED project as basis, IDIADA has performed standard tests on two MCS concepts (from ABB and HIT/HEP) to charge three Battery Electric Vehicles (SCA, VOL and REN), with full demonstration planned for WP7.

Publishable summary

The document "D3.3 - Conformance tests and guidelines for MCS norms" is part of the ZEFES project (Zero Emission flexible vehicle platform with modular powertrains serving the long-haul Freight Eco System), which falls under the Horizon Europe Programme's clean and competitive solutions for all transport modes initiative.

The deliverable provides:

- A comprehensive overview of grid and safety requirements at IDIADA facilities for conducting interoperability test activities on the Megawatt Charging System (MCS) within the ZEFES project.
- Details on the prototype design of the MCS vehicle simulator which will be used to conduct conformance testing.
- An introduction to vehicle-charger communication protocols covering everything from the physical layer to the application layer, including current and future standards that MCS charging will support.
- A brief overview of interoperability baseline protocols to understand their application regarding Heavy Duty Electric Vehicle (HDEV) charging.
- A comprehensive list of test cases that will be conducted during conformance testing, primarily following the standards ISO 15118-20 and IEC 61851-23-3.

This deliverable reports on the conformance tests and guidelines for MCS norms, including verification of MCS interfaces and communication layers. The test methodology has been created to ensure correct definition, execution, and interoperability.

The outcome includes a test device capable of validating the charging sequence and communication protocol by running designed test cases. Conformance and compatibility tests are being performed to validate the interoperability of the MCS for demonstration in Work Packages 5 and 7.

IDIADA has performed standard planned tests on two MCS concepts (provided by ABB and Hitachi Energy) to charge three Battery Electric Vehicles (from Scania, Volvo, and Renault) for full demonstration in Work Package 7.

This document represents an important step in ensuring standardized testing and interoperability for Megawatt Charging Systems, which is crucial for the deployment of heavy-duty electric vehicles and the decarbonization of long-haul transport.

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Project partners:

#	Partner short name	Partner Full Name
1	VUB	VRIJE UNIVERSITEIT BRUSSEL
2	FRD	FORD OTOMOTIV SANAYI ANONIM SIRKETI
4	KAE	KASSBOHRER FAHRZEUGWERKE GMBH
5	REN	RENAULT TRUCKS SAS
6	SCA	SCANIA CV AB
7	VET	VAN ECK TRAILERS BV
8	VOL	VOLVO TECHNOLOGY AB
8.1	CPA	CPAC SYSTEMS AB
9	ABB	ABB E-MOBILITY BV
9.1	ABP	ABB E-MOBILITY SPOLKA Z OGRANICZONAODPOWIEDZIALNOSCIA
9.2	ABG	ABB E-MOBILITY GMBH
10	AVL	AVL LIST GMBH
11	CM	SOCIEDAD ESPANOLA DE CARBUROS METALICOS SA
11.1	APG	AIR PRODUCTS GMBH
12	HEPL	HITACHI ENERGY POLAND SPOLKA Z OGRANICZONA ODPOWIEDZIALNOSCIA
13	MIC	MANUFACTURE FRANCAISE DES PNEUMATIQUES MICHELIN
14	POW	OPmobility
15	RIC-CZ	RICARDO PRAGUE S.R.O.
15.1	RIC-DE	RICARDO GMBH
16	UNR	UNIRESEARCH BV
17	ZF	ZF CV SYSTEMS HANNOVER GMBH
18	ALI	ALLIANCE FOR LOGISTICS INNOVATION THROUGH COLLABORATION IN EUROPE
19	DPD	DPD (NEDERLAND) B.V.
20	COL	ETABLISSEMENTEN FRANZ COLRUYT NV
21	GRU	GRUBER LOGISTICS S.P.A.
22	GBW	GEBRUEDER WEISS GESELLSCHAFT M.B.H.
23	PG	PROCTER & GAMBLE SERVICES COMPANY NV
23.1	PGP	PROCTER AND GAMBLE POLSKA SPOLKA Z OGRANICZONA ODPOWIEDZIALNOSCIA
23.2	PGA	PROCTER & GAMBLE AMIENS
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27	HAN	STICHTING HOGESCHOOL VAN ARNHEM ENNIJMEGEN HAN
28	IDI	IDIADA AUTOMOTIVE TECHNOLOGY SA
29	TNO	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO
30	UIC	UNION INTERNATIONALE DES CHEMINS DE FER
31	CFL	CFL MULTIMODAL S.A.
32	GSS	Grupo Logistico Sese
33	HIT	Hitachi ABB Power Grids Ltd.
34	IRU	UNION INTERNATIONALE DES TRANSPORTS ROUTIERS (IRU)
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