

DRAFT CCR Round 5 Equipment & Network Requirements

This is a draft of equipment and network requirements for Round 5 of CCR.

Proposed AC Charging Equipment Requirements

Power level	Max power >= 9.6 kW		
ONE OF THE FOLLOWING:			
1-1 (AC)	Safety requirements - Listing for AC Charging	Unit listed by qualified Nationally Recognized Test Lab (NRTL) to UL 2594 ; will include other UL standards as prescribed by the NRTL; to support criteria 1-3, certification to UL 2231-1 and UL 2231-2 is required; other standards likely to be referenced: UL 1998, UL 2251	Vendor Documentation. Vendor to provide name of NRTL used and a copy of the Certificate of Compliance. Proprietary information should not be included in the provided materials. The information should include a list of the UL standards used to vet the product and models covered by the listing. For Batch listed products, information must include serial number range or other product marking data that indicates equipment that falls under the batch listing. Field listing of equipment is not recognized in this process since it seeks to pre-qualify equipment. (applies to EVSE hardware only)
FE-6	Equipment Certification	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (g) https://www.federalregister.gov/d/2023-03500/p-374 "Equipment certification. States or other direct recipients must ensure that all chargers are certified by an Occupational Safety and Health Administration Nationally Recognized Testing Laboratory ... DCFC and AC Level 2 chargers should be certified to the appropriate Underwriters Laboratories (UL) standards for EV charging system equipment."	Vendor to attest to compliance (that EVSE meets requirements). Vendor to provide name of NRTL used and a copy of the Certificate of Compliance. Proprietary information should not be included in the provided materials. The information should include a list of the UL standards used to vet the product and models covered by the listing. For Batch listed products, information must include serial number range or other product marking data that indicates equipment that falls under the batch listing. Field listing of equipment is not recognized in this process since it seeks to pre-qualify equipment. Note: This is equivalent to EPRI criteria 1-1(AC) or 1-1(DC).
ONE OF THE FOLLOWING:			
1-2A (AC)	Connector and charging interface standard	EVSE charging interface compliant with SAE J1772	Vendor to attest that equipment has been tested with a minimum of 10 different makes (automotive brands) of plug-in electric vehicles. (applies to EVSE hardware only)
1-2C (AC)	Connector and charging interface standard	EVSE charging interface compliant with SAE J3400	Vendor to attest to compliance. (applies to EVSE hardware only)
ONE OF THE FOLLOWING:			
1-5	Energy Efficiency – Energy Star Compliant	Environmental Protection Association (EPA) ENERGY STAR for EVSE; EPA program related to energy efficiency of end use products; reference current EnergyStar EVSE document	Vendor documentation (that EVSE meets requirements). EPRI to verify EVSE is listed on EPA ENERGY STAR website.
FE-7(AC)	Energy Star Compliant	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (g) https://www.federalregister.gov/d/2023-03500/p-374 "and that all AC Level 2 chargers are ENERGY STAR certified."	Vendor to attest to compliance. EPRI will verify listing of EVSE product on Energy Star web portal. Note: This is equivalent to EPRI criteria 1-5.
2-1	Suitable for Outdoor Application	Enclosure rating suitable for outdoor application. This would be a rating of NEMA 3R or better.	Vendor to attest to compliance (that EVSE meets requirements). (UL certification should include outdoor application).
2-2(AC)	Operating Temperature Range	Equipment must be capable of normal operation over the temperature of -22°F to 104°F (-30°C to 40°C) (from UL 2594).	Vendor to attest to compliance .
2-3	American With Disabilities Act (ADA)	Must be capable of being installed in compliance with ADA requirements .	Vendor to attest to compliance (that EVSE meets requirements). Equipment must have capability to be installed in compliance with ADA requirements.
3-3	Ability to support remote demand response events	Network provides API access that would allow remote demand response events; this may be implemented with OpenADR2.0b	Vendor to attest to compliance (that EVSE meets requirements). Not applicable to Non-Networked EVSE. Only EVSE capability is evaluated for Network-Capable EVSE.
ONE OF THE FOLLOWING:			
3-4A	EVSE to Network Communications - Protocol	EVSE operates with and is compliant with the Open Charge Alliance Open Charge Point Protocol, Version 2.0.1	Vendor to attest to compliance (that EVSE meets requirements).
3-4B	EVSE to Network Communications - Protocol	EVSE has completed certification with the Open Charge Alliance for Core Certificate OCPP 2.0.1	Vendor documentation (that EVSE meets requirements). EPRI will verify listing of EVSE product on Open Charge Alliance product certification listing. https://openchargealliance.org/certificationocpp/
3-4C	EVSE to Network Communications - Protocol	EVSE has completed certification with the Open Charge Alliance for Advanced Security Certificate OCPP 2.0.1	Vendor documentation (that EVSE meets requirements). EPRI will verify listing of EVSE product on Open Charge Alliance product certification listing. https://openchargealliance.org/certificationocpp/
3-4E	EVSE to Network Communications - Protocol	EVSE is capable of being operated with the Open Charge Alliance Open Charge Point Protocol, Version 2.0.1	Vendor to attest to compliance (that EVSE meets requirements). This is considered verified if any of 3-4A to 3-4D are verified.
FE-10B	OCPP 2.0.1	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.108 (b) https://www.federalregister.gov/d/2023-03500/p-395 "By February 28, 2024, chargers must conform to OCPP 2.0.1."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements). Note: This is equivalent to EPRI criteria 3-4A, or 3-4B, or 3-4C, or 3-4D, or 3-4E.

Proposed AC Charging Equipment Requirements cont.

ONE OF THE FOLLOWING:			
CA-10	EV-EVSE Communications -ISO 15118	California Energy Commission (CEC) Docket Number 19-AB-2127; TN # 241955 - CEC Recommendation for Deployment of ISO 15118-Ready Chargers - includes definition of "ISO 15118-Ready Hardware"; California Public Utility Commission (CPUC) Decision 22-08-024 and Decision 22-11-040 as affirmed by Rulemaking 18-12-006 - required in CPUC regulated utility programs after July 1, 2023. From CEC TN # 241955 "An "ISO 15118-ready" charger is capable of, at minimum: 1. Powerline carrier (PLC) based high-level communication as specified in ISO 15118-3. 2. Secure management and storage of keys and certificates. 3. Transport Layer Security (TLS) version 1.2; additional support for TLS 1.3 or subsequent versions is recommended to prepare for future updates to the ISO 15118 standard. 4. Remotely receiving updates to activate or enable ISO 15118 use cases. 5. Connecting to a backend network. 6. Selecting the appropriate communication protocol used by the vehicle. An ISO 15118-ready charger uses at least one J1772 or CCS connector; this includes multiple-connector DC chargers with at least one CCS connector. ISO 15118-ready chargers should have onboard hardware to support the above capabilities, although software implementation of specific ISO 15118 use cases is not included in the scope of this recommendation. For example, an ISO 15118-ready charger should have the onboard hardware needed for Plug and Charge, but might not yet have Plug and Charge software implemented. ISO 15118-ready chargers should be capable of selecting the appropriate communication protocol used by the vehicle. AC chargers should support pulse-width modulation control as specified in J1772 and be capable of communicating using ISO 15118-2 and/or ISO 15118-20. DC chargers should support DIN 70121 and be capable of communicating using ISO 15118-2 and/or ISO 15118-20."	Vendor to attest to "ISO 15118-Ready Hardware" per CEC definition (that EVSE meets requirements or network supports requirements for Network ONLY).
FE-9B	Interoperability of charging infrastructure	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.108 (a) https://www.federalregister.gov/d/2023-03500/p-394 "By February 28, 2024, charger software must conform to ISO 15118-2 and be capable of Plug and Charge. Conformance testing for charger software and hardware should follow ISO 15118-4 and ISO 15118-5, respectively."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-5A	Payment Methods - Credit Card/Toll-free/SMS	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (1) https://www.federalregister.gov/d/2023-03500/p-370 "Provide for secure payment methods, accessible to persons with disabilities, which at a minimum shall include a contactless payment method that accepts major debit and credit cards, and either an automated toll-free phone number or a short message/messaging system (SMS) that provides the EV charging customer with the option to initiate a charging session and submit payment;"	Vendor to attest to compliance (that EVSE or EVSE and Network a meet requirements)
FE-5B	Payment Methods - Membership	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (2) https://www.federalregister.gov/d/2023-03500/p-371 "Not require a membership for use;"	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-5C	Payment Methods - delay/limits	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (3) https://www.federalregister.gov/d/2023-03500/p-372 "Not delay, limit, or curtail power flow to vehicles on the basis of payment method or membership;"	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-5D	Payment Methods - access	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (4) https://www.federalregister.gov/d/2023-03500/p-373 "Provide access for users that are limited English proficient and accessibility for people with disabilities. Automated toll-free phone numbers and SMS payment options must clearly identify payment access for these populations."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-8	Customer Service	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (k) https://www.federalregister.gov/d/2023-03500/p-385 "Charging station operators must enable access to accessible platforms that provide multilingual services."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-11	OCPI 2.2.1	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.108 (c) https://www.federalregister.gov/d/2023-03500/p-396 "By February 28, 2024, charging networks must be capable of communicating with other charging networks in accordance with Open Charge Point Interface (OCPI) 2.2.1."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-12	EVSE Network Switching Capability	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.108 (d) https://www.federalregister.gov/d/2023-03500/p-397 "Chargers must be designed to securely switch charging network providers without any changes to hardware."	Vendor to attest to compliance (that EVSE meets requirements)
FE-13	Charger to Charger Network Communications	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (1) https://www.federalregister.gov/d/2023-03500/p-420 "Chargers must communicate with a charging network via a secure communication method."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)

Proposed AC Charging Equipment Requirements cont.

FE-14	EVSE Remote Software Updates	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (2) https://www.federalregister.gov/d/2023-03500/p-421 "Chargers must have the ability to receive and implement secure, remote software updates and conduct real-time protocol translation, encryption and decryption, authentication, and authorization in their communication with charging networks."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-15	EVSE Remote Monitoring	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (3) https://www.federalregister.gov/d/2023-03500/p-422 "Charging networks must perform and chargers must support remote charger monitoring, diagnostics, control, and smart charge management. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-16	Data Communications	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (4) https://www.federalregister.gov/d/2023-03500/p-423 "Chargers and charging networks must securely measure, communicate, store, and report energy and power dispensed, real-time charging-port status, real-time price to the customer, and historical charging-port uptime. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-18	Disrupted Network Connectivity	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (e) https://www.federalregister.gov/d/2023-03500/p-427 "Chargers must remain functional if communication with the charging network is temporarily disrupted , such that they initiate and complete charging sessions, providing the minimum required power level."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-19	Communication of Price - Display	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.116 (a) (2) https://www.federalregister.gov/d/2023-03500/p-429 "The price for charging displayed and communicated via the charging network must be the real-time price (i.e., price at that moment in time). The price at the start of the session cannot change during the session."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-20	Communication of Price - other fees	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.116 (a) (3) https://www.federalregister.gov/d/2023-03500/p-430 " Price structure including any other fees in addition to the price for electricity to charge must be clearly displayed and explained. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-21	Data Available to Third Parties	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.116 (c) (1) through (9) https://www.federalregister.gov/d/2023-03500/p-440 "States or other direct recipients must ensure that the following data fields are made available, free of charge, to third-party software developers, via application programming interface: (1) Unique charging station name or identifier; (2) Address (street address, city, State, and zip code) of the property where the charging station is located; (3) Geographic coordinates in decimal degrees of exact charging station location; (4) Charging station operator name; (5) Charging network provider name; (6) Charging station status (operational, under construction, planned, or decommissioned); (7) Charging station access information: (i) Charging station access type (public or limited to commercial vehicles); (ii) Charging station access days/times (hours of operation for the charging station); (8) Charging port information: (i) Number of charging ports; (ii) Unique port identifier; (iii) Connector types available by port; (iv) Charging level by port (DCFC, AC Level 2, etc.); (v) Power delivery rating in kilowatts by port; (vi) Accessibility by vehicle with trailer (pull-through stall) by port (yes/no); (vii) Real-time status by port in terms defined by Open Charge Point Interface 2.2.1; (9) Pricing and payment information: (i) Pricing structure; (ii) Real-time price to charge at each charging port, in terms defined by Open Charge Point Interface 2.2.1; and (iii) Payment methods accepted at charging station."	Vendor to attest to compliance (that EVSE or EVSE and Network support required data collection)

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Proposed DC Charging Equipment Requirements

ONE OF THE FOLLOWING:			
1-1(DC)	Safety requirements - Listing for DC Charging	Unit must be listed by qualified Nationally Recognized Test Lab (NRTL) to UL 2202 ; will include other UL standards as prescribed by the NRTL; to support criteria 1-3, certification to UL 2231-1 and UL 2231-2 is required; other standards likely to be referenced: UL 1998, UL 2251	Vendor Documentation. Vendor to provide name of NRTL used and a copy of the Certificate of Compliance. Proprietary information should not be included in the provided materials. The information should include a list of the UL standards used to vet the product and models covered by the listing. For Batch listed products, information must include serial number range or other product marking data that indicates equipment that falls under the batch listing. Field listing of equipment is not recognized in this process since it seeks to pre-qualify equipment. (applies to EVSE hardware only)
FE-6	Equipment Certification	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (g) https://www.federalregister.gov/d/2023-03500/p-374 "Equipment certification. States or other direct recipients must ensure that all chargers are certified by an Occupational Safety and Health Administration Nationally Recognized Testing Laboratory ... DCFC and AC Level 2 chargers should be certified to the appropriate Underwriters Laboratories (UL) standards for EV charging system equipment."	Vendor to attest to compliance (that EVSE meets requirements). Vendor to provide name of NRTL used and a copy of the Certificate of Compliance. Proprietary information should not be included in the provided materials. The information should include a list of the UL standards used to vet the product and models covered by the listing. For Batch listed products, information must include serial number range or other product marking data that indicates equipment that falls under the batch listing. Field listing of equipment is not recognized in this process since it seeks to pre-qualify equipment. Note: This is equivalent to EPRI criteria 1-1(AC) or 1-1(DC).
ONE OF THE FOLLOWING:			
1-2A(DC)	Connector and charging interface standard - J1772 CCS	EVSE charging interface compliant with SAE J1772 CCS interface	For SAE J1772 CCS interface: Vendor to attest that each port type offered by equipment has been tested with a minimum of 5 different makes (automotive brands) of plug-in electric vehicles. (applies to EVSE hardware only)
1-2C(DC)	Connector and charging interface standard - J3400	EVSE charging interface compliant with SAE J3400	Vendor to attest to compliance. (applies to EVSE hardware only)
1-3B(DC)	Power quality criteria - REVISED	EVSE must be compliant with applicable portions of SAE J2894/1 based on testing as described in SAE J2894/2.	Vendor to attest to compliance with these elements of SAE J2894/1 (applies to EVSE hardware only): J2894/1 section 4.1: Power factor – minimum 95% J2894/1 section 4.2: Power conversion efficiency – tabular list in J2894 J2894/1 section 4.4: Total Demand Distortion – reference IEEE 519
2-1	Suitable for Outdoor Application	Enclosure rating suitable for outdoor application. This would be a rating of NEMA 3R or better.	Vendor to attest to compliance (that EVSE meets requirements). (UL certification should include outdoor application).
2-2(DC)	Operating Temperature Range	Equipment must be capable of normal operation at up to 104°F (40°C) (from UL 2202). NOTE: UL 2202 does not specify a lower operating temperature requirement.	Vendor to attest to compliance.
2-3	American With Disabilities Act (ADA)	Must be capable of being installed in compliance with ADA requirements .	Vendor to attest to compliance (that EVSE meets requirements). Equipment must have capability to be installed in compliance with ADA requirements.
3-3	Ability to support remote demand response events	Network provides API access that would allow remote demand response events; this may be implemented with OpenADR2.0b	Vendor to attest to compliance (that EVSE meets requirements). Not applicable to Non-Networked EVSE. Only EVSE capability is evaluated for Network-Capable EVSE.
ONE OF THE FOLLOWING:			
3-4A	EVSE to Network Communications - Protocol	EVSE operates with and is compliant with the Open Charge Alliance Open Charge Point Protocol, Version 2.0.1	Vendor to attest to compliance (that EVSE meets requirements).
3-4B	EVSE to Network Communications - Protocol	EVSE has completed certification with the Open Charge Alliance for Core Certificate OCPP 2.0.1	Vendor documentation (that EVSE meets requirements). EPRI will verify listing of EVSE product on Open Charge Alliance product certification listing. https://openchargealliance.org/certificationocpp/
3-4C	EVSE to Network Communications - Protocol	EVSE has completed certification with the Open Charge Alliance for Advanced Security Certificate OCPP 2.0.1	Vendor documentation (that EVSE meets requirements). EPRI will verify listing of EVSE product on Open Charge Alliance product certification listing. https://openchargealliance.org/certificationocpp/
3-4E	EVSE to Network Communications - Protocol	EVSE is capable of being operated with the Open Charge Alliance Open Charge Point Protocol, Version 2.0.1	Vendor to attest to compliance (that EVSE meets requirements). This is considered verified if any of 3-4A to 3-4D are verified.
FE-10B	OCPP 2.0.1	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.108 (b) https://www.federalregister.gov/d/2023-03500/p-395 "By February 28, 2024, chargers must conform to OCPP 2.0.1."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements). Note: This is equivalent to EPRI criteria 3-4A, or 3-4B, or 3-4C, or 3-4D, or 3-4E.

Proposed DC Charging Equipment Requirements cont.

ONE OF THE FOLLOWING:			
CA-10	EV-EVSE Communications- ISO 15118	California Energy Commission (CEC) Docket Number 19-AB-2127; TN # 241955 - CEC Recommendation for Deployment of ISO 15118-Ready Chargers - includes definition of "ISO 15118-Ready Hardware"; California Public Utility Commission (CPUC) Decision 22-08-024 and Decision 22-11-040 as affirmed by Rulemaking 18-12-006 - required in CPUC regulated utility programs after July 1, 2023. From CEC TN # 241955 "An "ISO 15118-ready" charger is capable of, at minimum: 1. Powerline carrier (PLC) based high-level communication as specified in ISO 15118-3. 2. Secure management and storage of keys and certificates. 3. Transport Layer Security (TLS) version 1.2; additional support for TLS 1.3 or subsequent versions is recommended to prepare for future updates to the ISO 15118 standard. 4. Remotely receiving updates to activate or enable ISO 15118 use cases. 5. Connecting to a backend network. 6. Selecting the appropriate communication protocol used by the vehicle. An ISO 15118-ready charger uses at least one J1772 or CCS connector; this includes multiple-connector DC chargers with at least one CCS connector. ISO 15118-ready chargers should have onboard hardware to support the above capabilities, although software implementation of specific ISO 15118 use cases is not included in the scope of this recommendation. For example, an ISO 15118-ready charger should have the onboard hardware needed for Plug and Charge, but might not yet have Plug and Charge software implemented. ISO 15118-ready chargers should be capable of selecting the appropriate communication protocol used by the vehicle. AC chargers should support pulse-width modulation control as specified in J1772 and be capable of communicating using ISO 15118-2 and/or ISO 15118-20. DC chargers should support DIN 70121 and be capable of communicating using ISO 15118-2 and/or ISO 15118-20."	Vendor to attest to "ISO 15118-Ready Hardware" per CEC definition (that EVSE meets requirements or network supports requirements for Network ONLY).
FE-9A	Interoperability of charging infrastructure	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (a) https://www.federalregister.gov/d/2023-03500/p-394 "Chargers must conform to ISO 15118-3 and must have hardware capable of implementing both ISO 15118-2 and ISO 15118-20."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-4(DC)	DCFC Output Voltage	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (d) (1) https://www.federalregister.gov/d/2023-03500/p-366 "DCFC charging ports must support output voltages between 250 volts DC and 920 volts DC. "	Vendor to attest to compliance (that EVSE meets requirements).
FE-5A	Payment Methods - Credit Card/Toll-free/SMS	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (1) https://www.federalregister.gov/d/2023-03500/p-370 "Provide for secure payment methods, accessible to persons with disabilities, which at a minimum shall include a contactless payment method that accepts major debit and credit cards, and either an automated toll-free phone number or a short message/messaging system (SMS) that provides the EV charging customer with the option to initiate a charging session and submit payment;"	Vendor to attest to compliance (that EVSE or EVSE and Network a meet requirements)
FE-5B	Payment Methods - Membership	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (2) https://www.federalregister.gov/d/2023-03500/p-371 "Not require a membership for use;"	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-5C	Payment Methods - delay/limits	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (3) https://www.federalregister.gov/d/2023-03500/p-372 "Not delay, limit, or curtail power flow to vehicles on the basis of payment method or membership;"	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-5D	Payment Methods - access	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (4) https://www.federalregister.gov/d/2023-03500/p-373 "Provide access for users that are limited English proficient and accessibility for people with disabilities. Automated toll-free phone numbers and SMS payment options must clearly identify payment access for these populations."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-8	Customer Service	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (k) https://www.federalregister.gov/d/2023-03500/p-385 "Charging station operators must enable access to accessible platforms that provide multilingual services."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-11	OCPI 2.2.1	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.108 (c) https://www.federalregister.gov/d/2023-03500/p-396 "By February 28, 2024, charging networks must be capable of communicating with other charging networks in accordance with Open Charge Point Interface (OCPI) 2.2.1."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-12	EVSE Network Switching Capability	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.108 (d) https://www.federalregister.gov/d/2023-03500/p-397 "Chargers must be designed to securely switch charging network providers without any changes to hardware."	Vendor to attest to compliance (that EVSE meets requirements)

Proposed DC Charging Equipment Requirements cont.

FE-13	Charger to Charger Network Communications	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (1) https://www.federalregister.gov/d/2023-03500/p-420 "Chargers must communicate with a charging network via a secure communication method. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-14	EVSE Remote Software Updates	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (2) https://www.federalregister.gov/d/2023-03500/p-421 "Chargers must have the ability to receive and implement secure, remote software updates and conduct real-time protocol translation, encryption and decryption, authentication, and authorization in their communication with charging networks."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-15	EVSE Remote Monitoring	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (3) https://www.federalregister.gov/d/2023-03500/p-422 "Charging networks must perform and chargers must support remote charger monitoring, diagnostics, control, and smart charge management. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-16	Data Communications	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (4) https://www.federalregister.gov/d/2023-03500/p-423 "Chargers and charging networks must securely measure, communicate, store, and report energy and power dispensed, real-time charging-port status, real-time price to the customer, and historical charging-port uptime. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-18	Disrupted Network Connectivity	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) https://www.federalregister.gov/d/2023-03500/p-427 "Chargers must remain functional if communication with the charging network is temporarily disrupted , such that they initiate and complete charging sessions, providing the minimum required power level."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-19	Communication of Price - Display	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.116 (a) (2) https://www.federalregister.gov/d/2023-03500/p-429 "The price for charging displayed and communicated via the charging network must be the real-time price (i.e., price at that moment in time). The price at the start of the session cannot change during the session."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-20	Communication of Price - other fees	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.116 (a) (3) https://www.federalregister.gov/d/2023-03500/p-430 " Price structure including any other fees in addition to the price for electricity to charge must be clearly displayed and explained. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-21	Data Available to Third Parties	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.116 (c) (1) through (9) https://www.federalregister.gov/d/2023-03500/p-440 "States or other direct recipients must ensure that the following data fields are made available, free of charge, to third-party software developers, via application programming interface: (1) Unique charging station name or identifier; (2) Address (street address, city, State, and zip code) of the property where the charging station is located; (3) Geographic coordinates in decimal degrees of exact charging station location; (4) Charging station operator name; (5) Charging network provider name; (6) Charging station status (operational, under construction, planned, or decommissioned); (7) Charging station access information: (i) Charging station access type (public or limited to commercial vehicles); (ii) Charging station access days/times (hours of operation for the charging station); (8) Charging port information: (i) Number of charging ports; (ii) Unique port identifier; (iii) Connector types available by port; (iv) Charging level by port (DCFC, AC Level 2, etc.); (v) Power delivery rating in kilowatts by port; (vi) Accessibility by vehicle with trailer (pull-through stall) by port (yes/no); (vii) Real-time status by port in terms defined by Open Charge Point Interface 2.2.1; (9) Pricing and payment information: (i) Pricing structure; (ii) Real-time price to charge at each charging port, in terms defined by Open Charge Point Interface 2.2.1; and (iii) Payment methods accepted at charging station."	Vendor to attest to compliance (that EVSE or EVSE and Network support required data collection)

DRAFT CCR Round 5 Equipment & Network Requirements

This is a draft of equipment and network requirements for Round 5 of CCR.

Proposed Network Requirements

FE-5A	Payment Methods - Credit Card/Toll-free/SMS	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (1) https://www.federalregister.gov/d/2023-03500/p-370 "Provide for secure payment methods , accessible to persons with disabilities, which at a minimum shall include a contactless payment method that accepts major debit and credit cards, and either an automated toll-free phone number or a short message/messaging system (SMS) that provides the EV charging customer with the option to initiate a charging session and submit payment;"	Vendor to attest to compliance (that EVSE or EVSE and Network a meet requirements)
FE-5B	Payment Methods - Membership	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (2) https://www.federalregister.gov/d/2023-03500/p-371 "Not require a membership for use;"	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-5C	Payment Methods - delay/limits	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (3) https://www.federalregister.gov/d/2023-03500/p-372 "Not delay, limit, or curtail power flow to vehicles on the basis of payment method or membership;"	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-5D	Payment Methods - access	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (f) (4) https://www.federalregister.gov/d/2023-03500/p-373 "Provide access for users that are limited English proficient and accessibility for people with disabilities. Automated toll-free phone numbers and SMS payment options must clearly identify payment access for these populations."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-8	Customer Service	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.106 (k) https://www.federalregister.gov/d/2023-03500/p-385 "Charging station operators must enable access to accessible platforms that provide multilingual services."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-9B	Interoperability of charging infrastructure	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.108 (a) https://www.federalregister.gov/d/2023-03500/p-394 "By February 28, 2024, charger software must conform to ISO 15118-2 and be capable of Plug and Charge. Conformance testing for charger software and hardware should follow ISO 15118-4 and ISO 15118-5, respectively."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-10B	OCPP 2.0.1	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.108 (b) https://www.federalregister.gov/d/2023-03500/p-395 "By February 28, 2024, chargers must conform to OCPP 2.0.1."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements). Note: This is equivalent to EPRI criteria 3-4A, or 3-4B, or 3-4C, or 3-4D, or 3-4E.

Proposed Network Requirements cont.

FE-11	OCPI 2.2.1	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.108 (c) https://www.federalregister.gov/d/2023-03500/p-396 "By February 28, 2024, charging networks must be capable of communicating with other charging networks in accordance with Open Charge Point Interface (OCPI) 2.2.1. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-13	Charger to Charger Network Communications	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (1) https://www.federalregister.gov/d/2023-03500/p-420 "Chargers must communicate with a charging network via a secure communication method. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-14	EVSE Remote Software Updates	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (2) https://www.federalregister.gov/d/2023-03500/p-421 "Chargers must have the ability to receive and implement secure, remote software updates and conduct real-time protocol translation, encryption and decryption, authentication, and authorization in their communication with charging networks."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-15	EVSE Remote Monitoring	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (3) https://www.federalregister.gov/d/2023-03500/p-422 "Charging networks must perform and chargers must support remote charger monitoring, diagnostics, control, and smart charge management. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-16	Data Communications	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (a) (4) https://www.federalregister.gov/d/2023-03500/p-423 "Chargers and charging networks must securely measure, communicate, store, and report energy and power dispensed, real-time charging-port status, real-time price to the customer, and historical charging-port uptime. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-18	Disrupted Network Connectivity	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.114 (e) https://www.federalregister.gov/d/2023-03500/p-427 "Chargers must remain functional if communication with the charging network is temporarily disrupted , such that they initiate and complete charging sessions, providing the minimum required power level."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-19	Communication of Price - Display	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.116 (a) (2) https://www.federalregister.gov/d/2023-03500/p-429 "The price for charging displayed and communicated via the charging network must be the real-time price (i.e., price at that moment in time). The price at the start of the session cannot change during the session."	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)
FE-20	Communication of Price - other fees	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.116 (a) (3) https://www.federalregister.gov/d/2023-03500/p-430 " Price structure including any other fees in addition to the price for electricity to charge must be clearly displayed and explained. "	Vendor to attest to compliance (that EVSE or EVSE and Network meets requirements)

Proposed Network Requirements cont.

FE-21	Data Available to Third Parties	Department of Transportation [4910-22-P] - Federal Highway Administration 23 CFR Part 680 [FHWA Docket N. FHWA-2022-0008]. RIN 2125-AG10. National Electric Vehicle Infrastructure Standards and Requirements. 680.116 (c) (1) through (9) https://www.federalregister.gov/d/2023-03500/p-440 "States or other direct recipients must ensure that the following data fields are made available, free of charge, to third-party software developers, via application programming interface: (1) Unique charging station name or identifier; (2) Address (street address, city, State, and zip code) of the property where the charging station is located; (3) Geographic coordinates in decimal degrees of exact charging station location; (4) Charging station operator name; (5) Charging network provider name; (6) Charging station status (operational, under construction, planned, or decommissioned); (7) Charging station access information: (i) Charging station access type (public or limited to commercial vehicles); (ii) Charging station access days/times (hours of operation for the charging station); (8) Charging port information: (i) Number of charging ports; (ii) Unique port identifier; (iii) Connector types available by port; (iv) Charging level by port (DCFC, AC Level 2, etc.); (v) Power delivery rating in kilowatts by port; (vi) Accessibility by vehicle with trailer (pull-through stall) by port (yes/no); (vii) Real-time status by port in terms defined by Open Charge Point Interface 2.2.1; (9) Pricing and payment information: (i) Pricing structure; (ii) Real-time price to charge at each charging port, in terms defined by Open Charge Point Interface 2.2.1; and (iii) Payment methods accepted at charging station."	Vendor to attest to compliance (that EVSE or EVSE and Network support required data collection)
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