QualityLogic

TRAINING WORKSHOP

Getting the Most from Your CCS Interoperability Testing Process

OVERVIEW

This unique training workshop will quickly educate participants in the process and nuances of CCS interoperability test with the aim of improving efficiency and effectiveness of their interoperability testing programs.

The Workshop is by our instructors with deep expertise in analyzing CCS charging session files and experience in organizing the interoperability testing process for optimum results. The target audience are those managers and engineers focused on improving the ROI of CCS interoperability testing.

Even with the change in US government policy towards EVs, the consumer interest remains strong. J.D. Power's 2025 Electric Vehicle Consideration Study (fielded Jan–Apr 2025) finds 24% "very likely" and 35% "somewhat likely" to consider an EV for their next purchase. The report shows these figures are unchanged from a year earlier, with no meaningful shift since the inauguration[1].

There is a massive build-out of charging stations, driven by vehicle manufacturers, charge point operators, and government funding. However, the interoperability between electric vehicles and charging stations using the DIN 70121 and ISO 15118 is in a dismal state with over 20% of attempted DC-Fast Charging charge sessions failing due to communication, hardware, or protocol exchange problems[2].

These interoperability problems frustrate consumers, are costly for all the manufacturers involved, and if not addressed, slow the adoption of EVs. The industry addresses interoperability issues through multiple charging session tests, both in a lab and in the field with real EVs and EVSEs.

A key benefit of the Workshop is the use of the new CCS Analyzer during the Workshop. The Analyzer is a great training tool for people learning ISO 15118 and how to analyze interoperability test sessions.

The process is illustrated below:

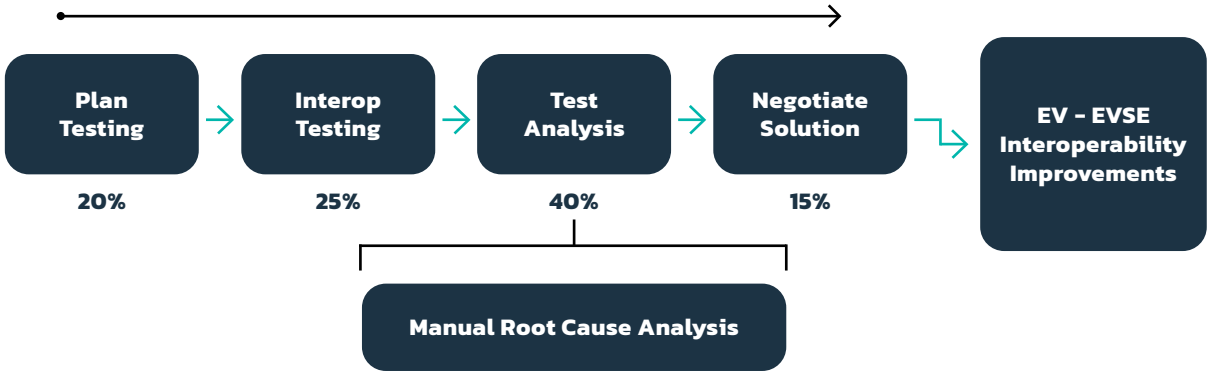

Figure 1: Interoperability Testing Process and Resource Allocation

[1] JD Power Press Release: EV Purchase Consideration Holds Steady amid Market Uncertainty, May 2025
[2] JD Power 2024 US EV Experience Public Charging Study, Aug 2023.

The interoperability testing process shown in Figure 1 includes 4 major stages: planning of interoperability testing; conducting the testing itself; analyzing the test sessions for root cause, timings and other issues and reporting the results; and working with the relevant engineering teams to resolve interoperability issues. We've estimated relative investment allocated to each stage of the process.

Interoperability testing is still in a "start-up" state with interoperability managers and engineers continually evolving their processes to be more effective and more efficient. The Interoperability teams must decide:

- How many vehicles or EVSEs need to be interoperability tested;
- How often should to test different products;
- How many production versus pre-production systems to test;
- Where to conduct testing and how to organize it;
- What data and how much of it is worth the effort to collect and analyze it;
- What instrumentation and tools can improve the process; and
- How to most efficiently use the test results to improve interoperability of their products.

The Analysis Stage of the process is primarily manual today and takes an inordinate amount of time and expertise to succeed. A trained engineer may still take hours or even days to troubleshoot and get a problem resolved. To the extent that field technicians can conduct this kind of analysis, valuable engineering time can be allocated to other priorities. Analysis of interoperability charging tests requires significant training and skills including:

- An understanding of the CCS protocols and industry agreements on using the standards
- Access to and skills in using the various tools available to conduct and analyze interoperability tests
- A knowledge of the types of issues likely to cause interoperability problems and how to identify them

QualityLogic has been working with the CCS standard and interoperability testing since 2022 and has developed a unique body of knowledge about this subject. QualityLogic has developed a unique product for automating the analysis of CCS interoperability test sessions to identify charging failure causes and other valuable data much more efficiently than current methods. Working with leading teams conducting interoperability testing, the knowledge we have developed puts us in a position to share it through a training program for managers, engineers and technicians who are or will be working with CCS charging interoperability.

This is the first course we are offering (and first of its kind as far as we know) aimed this topic.

TRAINING WORKSHOP AT A GLANCE

The workshop starts with an overview of the CCS EV charging eco-system and the goals and process for interoperability testing today. We then take a high-level look at how to design (or improve) and implement the process used for interoperability testing. We then provides an overview of the tools available to assist in interoperability testing and analysis, including test cases and the engineering tools that can assist in the process. The analysis section includes hands-on experience with available tools such as Wireshark and QualityLogic's CCS Analyzer.

The Workshop spends significant time on the analysis of the charging session results since the goal of the interoperability testing is to identify information critical to improving conformance, interoperability and performance of CCS charging. The new analysis tool from QualityLogic is made available to participants for the workshop and two weeks afterwards to assist in quickly understanding the process, anomalies and reporting of CCS interoperability information.

Finally, the workshop discusses the process of using the results of the interoperability testing and potential future enhancements to the overall process

Participants will learn:

- The role of interoperability testing in achieving charging interoperability.
- Best practices in planning and execution of interoperability testing
- The standards and tools for interoperability testing
- How to analyze interoperability test sessions for root causes of failures
- Improving ROI on interoperability testing
- The role of AI in achieving charging interoperability

FLEXIBLE TRAINING OPTIONS

- Workshops are offered as either private or public sessions
- On-site training is available, and is the best way to learn about the material
- Related technology training is also available from QualityLogic. Visit our smart energy training page for details

WORKSHOP MODULES

SESSION 1

The EV-EVSE charging interoperability ecosystem

- The CCS standard and interoperability challenges
- Why interoperability problems exist
- CCS model for achieving interoperability

SESSION 2

The Interoperability testing process

- Interoperability testing as part of the development and maintenance process
- Interoperability testing objectives
- Interoperability test cases – existing and in process
- Interoperability testing and conformance testing

SESSION 3

Tools for interoperability testing

- Conformance test systems
- Man-in-the-middle capture and display systems
- Non-intrusive sniffers
- Interoperability test suites from ChargeX and CharIN
- Interoperability test systems
- Real-time versus post-test analysis
- Wireshark and Wireshark plugins
- Standardized error codes
- Standardized vs proprietary session captured files
- Hands-on introduction to Wireshark and some plugins

SESSION 4

Analyzing interoperability charging test sessions

- Objectives for analyzing interop charging sessions
- Manual analysis and supporting tools
- Reporting of interop test results
- The analysis gap – what are we missing
- Hands-on analysis of PCAP files for root causes of interoperability issues

SESSION 5

Automating analysis and reporting

- **Speeding up the analysis process with a new class of analysis tool**
- **Extracting more information from the interop charging sessions**
- **Re-thinking the interop testing process**
- **Hands-on analysis of non-fatal anomalies, timing statistics, interop issues trend and performance analysis**

SESSION 6

The Interoperability testing process

- Feedback for product conformance improvement
- Accommodating non-conformant behaviors
- Improving the standards and test specifications
- The future of Interoperability Testing

THE TEAM BEHIND THE TRAINING

Through our work with dozens of companies struggling to identify interoperability anomalies and performance, QualityLogic has been exposed to a broad range of tools and approaches to the interoperability testing business. Combined with over three decades of developing test automation tools for conformance and interoperability testing, we are able to provide a unique training experience to engineers and technicians working to improve interoperability of CCS charging.

The workshop is led by a team of experts who represent the full spectrum of CCS interoperability knowledge. One instructor is an industry leader in smart grid standards and interoperability, known for his deep experience with ecosystem maturity and his many presentations on CCS interoperability at leading EV and EVSE companies. Another is the lead developer of the QualityLogic CCS Analyzer, who has worked directly with dozens of companies to investigate and resolve interoperability issues, while also developing the next generation of CCS interoperability tools. Rounding out the team is a veteran of one of the industry's most successful charging interoperability testing programs, whose hands-on knowledge of tools, testing practices, and problem-solving provides a practical foundation for engineers seeking to improve the reliability and performance of CCS systems.

ACCELERATE YOUR TEAM'S INTEROPERABILITY SKILLS

The future of EV charging and V2G depends on solving interoperability at scale. QualityLogic's workshop bridges the gap between today's trial-and-error approaches and tomorrow's efficient, automated testing processes. By learning directly from the engineers and thought leaders driving this field forward, your team gains the skills and tools to transform interoperability testing from a bottleneck into a competitive advantage.

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