



HYDROGEN QUALITY

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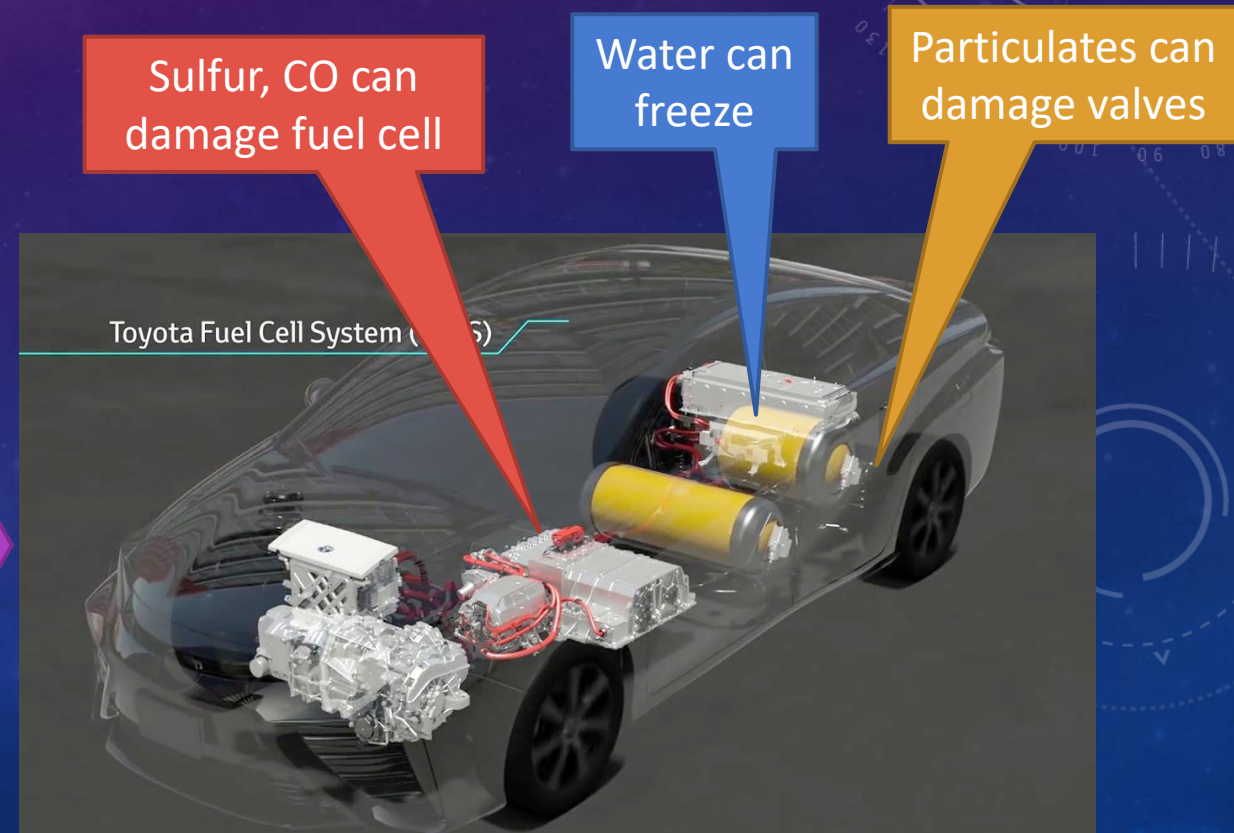
(REPRESENTING TOYOTA MOTOR NORTH AMERICA)

NWCM INTERIM MEETING

JANUARY, 2024

GOOD HYDROGEN QUALITY IS CRITICAL FOR HYDROGEN CARS

- Minute amounts (ppm-ppb) can impact the fuel cell that converts hydrogen & air into electricity
- Water, particulates, and other liquids can damage components.



HYDROGEN DISPENSING VALIDATION IN CALIFORNIA

- Currently, ~15K hydrogen vehicles, and >50 stations in California
- Validation being done by
 - Protocol: California Air Resources Board (ARB) CSA HGV 4.3 using Hystep device
 - W&M: California Dept of Food & Agriculture (CDFA) using mobile test unit
- **Poor hydrogen quality can also damage test equipment**



CA ARB Hystep Device



CDFA
W&M mobile test unit

FLR-23.3 HYDROGEN QUALITY REQUIREMENTS

- SAE J2719 and ISO 14687 are parallel standards that take turns harmonizing (Impurity levels are practically the same)
- Every version creates changes that ensures vehicles are protected and reduces complexity in hydrogen supply chain
- Important to allow both standards, so that most recent standard can be used

- FLR-23.3

2.20. Hydrogen Fuel. – Shall meet the latest version of SAE J2719, “Hydrogen Fuel Quality for Fuel Cell Vehicles.” Or ISO 14687 Grade (D) “Hydrogen fuel quality – Product specification”.

(Added 2012) (Amended 20XX)

Support modification proposed at regional meetings (shown above)



FLR-23.4 ADD FILTER REQUIREMENT

- Filter requirement similar to gasoline and other fuels
- Will ensure vehicle is protected from particulate and liquid contaminants
- Matches requirements in other hydrogen dispensing and fuel standards



- FLR-23.4

(c) All gaseous hydrogen dispensers shall have a 5 micron or smaller nominal pore-sized filter and a filter to protect the vehicle from liquid contamination. (Amended 2014, 20XX)

Support modification proposed at regional meetings (shown above)

WHY ARE THESE PROPOSALS IMPORTANT?

- Protects vehicle (consumer), dispenser, and test equipment
- Ensures latest hydrogen quality requirements are being used
- Author supports all regional modifications
- Request voting status for both proposals