UTC Power Comments on the "Proposed 2008 Amendments to the California Zero Emission Vehicle Program"

March 27, 2008

UTC Power appreciates the opportunity to submit the following comments on the "Proposed 2008 Amendments to the California Zero Emission Vehicle Program" that are recommended by the ARB staff.

UTC Power Background

UTC Power, a business unit of United Technologies Corporation, is the world leader in fuel cell development and deployment. With 50 years of experience, UTC Power is the only company in the world that develops and produces fuel cells in three major markets: on-site power, transportation and space flight applications and we are the only U.S. fuel cell company independent of the automotive OEMs that is actively involved in transportation products.

In the transportation market, we have developed fuel cells for a number of automotive customers including Hyundai, BMW and Nissan and are working with, or have worked with many of the world's major automobile manufacturers on fuel cell powered vehicles. UTC Power, along with its partners Chevron and Hyundai, is participating in the Department of Energy's Hydrogen Learning Demonstration program. As part of this initiative, we have provided power plants for 32 Hyundai and Kia vehicles, including 27 in California. Twenty-one of these vehicles are already on the road in California and have accumulated over 10,000 hours and 200,000 miles of real world experience. In addition, we have provided 120 kW PureMotion® fuel cell power systems to California that are currently powering three zero-emission transit buses in revenue service in Oakland with AC Transit, one transit bus in Palm Desert with Sunline Transit, as well as one in Connecticut and one in Belgium. A number of additional zero-emission buses are planned for deployment throughout the United States and Europe over the next 18 months. Our current generation of PureMotion® fuel cell technology has accumulated more than 10,000 hours and 100,000 miles of transit bus operating experience in California alone.

CARB Leadership

The California Air Resource Board's vision and its leadership in zero-emission vehicle technology has served as a catalyst for substantial investment and progress in the commercialization of sustainable transportation in the United States and throughout the world. California's initiatives have been instrumental in deploying fuel cell automobiles that have logged well over one million combined miles by the partners at the California Fuel Cell Partnership. UTC Power is a proud supporter of the CaFCP since its inception in November of 2000 and our president, Jan van Dokkum, is the current Chairman.

CARB, along with WestStart-CALSTART and the California Energy Commission play a pivotal role in the commercialization of fuel cell technology for a number of related California initiatives including the Zero Emission Bus (ZBus) mandate and the

implementation of the Global Climate Change Solutions Act (AB 32). As CARB considers the proposed amendments to the ZEV regulations, it is essential that any changes in this program be closely examined for the impact on related activities, as well as the ripple effect that may ensue in other states that are following precedents set in California.

Summary

UTC Power has been a strong and consistent supporter of California's Zero Emission Vehicle (ZEV) activities and the positive impact they have made in technology development. The ZEV rule is a groundbreaking model that has been followed by 10 other states. Any changes will likely impact developments across the nation for light duty vehicles and could also have a negative impact on California's landmark Zero Emission Bus mandate.

While it might be tempting for California to move to a greater emphasis on hybrids, PHEVs, and alternative electric powertrain configurations in the short-term, to remain a leader in ZEV initiatives, UTC Power believes the state of California must not lose its focus on a hydrogen powered transportation system that is ultimately derived from renewable fuels.

Therefore, UTC Power opposes any change to the current legislation that would dilute or delay the requirement for pure ZEV's. We believe the regulations should be founded on performance based metrics whereby the definition of "zero" is not open for debate. Any wavering on the definition of "zero" delays in milestones or watering down of the requirements will send a strong and inappropriate signal to stakeholders that already have a role in the commercialization of sustainable transportation. Investment capital, suppliers, component manufacturers, vehicle original equipment manufacturers, energy suppliers and, ultimately, consumers are heavily influenced by CARB's ZEV decisions. Any effort to slow the ZEV initiatives will result in a major shift of investment into other areas making it much harder to obtain the financial resources needed for ZEV development. Significant progress has been made towards the commercialization of zero-emission automotive and transit bus vehicles. It is UTC Power's desire that any changes made in the ZEV regulations will not affect the steadfast introduction of these vehicles. Hydrogen powered fuel cell hybrid buses have been demonstrated in commercial service by California transit companies. That success should give CARB reason to maintain its sense of purpose for the transportation sector as a whole.

Some say hydrogen powered vehicles are just too far into the future to worry about. However, at the current pace, some studies predict the global motor vehicle population will double within the next thirty years. Vehicles are kept on the road for over eight years of useful life before they are replaced with new technology. At the current new vehicle sale and replacement rate, the CO2 saved by the most progressive gasoline or diesel hybrid technology will be washed over by the sheer increase in the number of vehicles worldwide.

With the explosive development of transportation systems in China and India, and the consensus of the world scientific community forming around a necessary 50% CO2 reduction in the decades ahead, now is not the time for California to redirect efforts away from renewable hydrogen and toward near-term efforts with PHEVs.

It's about CO2. The eyes of the world are on California as a leader in climate change and sustainable transportation.

UTC Power's comments on specific proposed changes are provided below.

Proposed Changes

Provide More Equal Treatment of Battery Electric Vehicles (BEVs)

The ARB staff recommends elimination of the cap on the use of full-function and city EVs within the Alternative Compliance Path. Change the ratio for substitution for each vehicle type to be consistent with the credit earned by the vehicle.

UTC Power Comment

UTC Power opposes this recommendation because BEV technologies are not expected to meet the range requirements of today's vehicles, recharge time remains a significant obstacle to consumer acceptance and CO2 emissions are pushed back to the electrical power plant. To offset the effects of climate change, many scientists agree that CO2 emissions must be significantly reduced by 2050. While BEVs may provide a point of use emissions benefit, an overall benefit is not realized unless renewable energy is used. Hydrogen powered vehicles can fulfill customer expectations while meeting the challenge of using a renewable fuel. Increased focus on BEVs will likely add delays to fuel cell vehicle commercialization and hinder the build-up of the hydrogen infrastructure by diverting some of the investment to battery charging stations. Investing in two new infrastructures would be too costly and disruptive.

Enhanced Advanced Technology Partial Zero Emission Vehicles

The proposed regulation change creates a new category called "Enhanced Advanced Technology Partial ZEVs" to meet up to 90% of pure ZEV requirement in 2012-14 and 50% in 2015-17. They must use ZEV fuel such as electricity or H2 (Plug-Ins and H2ICE) and they would receive one or more credits.

UTC Power Comment on Plug-In Hybrid Electric Vehicles (PHEVs)

UTC Power opposes the pure ZEV requirement being offset by PHEVs, which use gasoline or diesel and have tailpipe emissions, long recharge times and can worsen the peaking problems for California's electric grid. As the independent panel chartered by the ARB stated in its May 2007 report, it is unclear how these vehicles will be operated in the real world (gasoline or diesel versus battery power), further eroding confidence in their ability to meet a true "zero" emission requirement. The high Silver category credits PHEVs presently receive, coupled with the battery interest and improvements already afforded by the HEV market, mean that PHEVs relying on gasoline or diesel fuel are already receiving the support they need to come to market. Increased focus on PHEVs that use gasoline or diesel fuel also will likely add delays to fuel cell vehicle commercialization and slow the build-up of the hydrogen infrastructure. If ARB feels it necessary to allow PHEVs as a pure ZEV offset as a temporary solution, then UTC recommends limiting the offset to 50% in 2012-2014 and 25% in 2015-2017 for those PHEV vehicles that run on H2. PHEV vehicles that rely on gasoline or diesel fuel should not contribute to a pure ZEV offset since they would drive counter productive activity in non-renewable fuels.

UTC Power Comment on Hydrogen Internal Combustion Vehicles (H2ICE)
UTC Power opposes the pure ZEV requirement being offset by H2ICEs because tailpipe emissions are still present. Some benefit for these vehicles is already being recognized by the high Silver category credits they currently receive. UTC Power, however, would support an even higher Silver category credit for H2ICE vehicles that incorporate a fuel cell as an Auxiliary Power Unit (APU) or as part of a hybrid-vehicle traction system. Such vehicles stimulate progress in fuel cell development, help to advance on-board hydrogen storage technologies and promote the build-up of the hydrogen infrastructure. If ARB feels it is necessary to allow H2ICEs as a pure ZEV offset as a temporary solution to the industry, then UTC recommends limiting the offset to 50% in 2012-2014 and 25% in 2015-2017.

Increased Transition Time for Intermediate Volume Manufacturers
The proposed amendment allows for a ramp-up period of an additional six years (12 years total) for intermediate volume manufacturers (IVM) who are transitioning to large volume status. During this time, an automaker would be allowed to meet its ZEV requirements with increasing numbers of partial ZEV allowance (PZEV), of which a percentage must be Advanced Technology PZEVs.

UTC Power Comment
There have been mixed results in the efforts of Intermediate Volume Manufacturers to develop ZEV's. For some, a wait-and-see philosophy has allowed them to forestall necessary R&D investments in ZEV development because the requirements have been delayed. Others have made a concerted effort to develop vehicles that will meet the requirement. UTC Power recommends keeping the Intermediate Volume Manufacturer definition unchanged, recognizing that the present definition allows for a generous 6-year transition period to Large Manufacturer status. We believe plans are in place at most Intermediate Volume Manufacturers to meet the ZEV requirement and changes to the definition will disadvantage Intermediate Manufacturers who have made a concerted effort to meet the ZEV requirement.

Extend State "Travel Provisions"
Extend the provision that allows Type III ZEVs placed in any state that has adopted California's ZEV program to count towards California's ZEV requirement through 2017, and include Type IV ZEVs. Include battery EVs within the provision but sunset the application of this provision for these vehicles in 2014.

UTC Power Comment
As noted above, the California ZEV program has set a very positive precedent for 10 other states (known as Section 177 states) that are following its lead. The harmonization of rules by the various states that are providing leadership on this issue is essential. UTC Power supports the ARB staff recommendation to extend the Travel Provision providing the cap on the use of full-function and city BEVs as discussed earlier remains in place.

Conclusion
California's sustained and unwavering commitment to the zero-emission vehicle initiative is critical to provide the required certainty for the entire product development and supply chain investment effort. Consistency is paramount to the successful commercialization of zero-emission vehicles that will ultimately rely on renewable fuels. CARB need not let

up on automobiles or on bus programs that can drive investment and innovation. Delays in the implementation of ZEV initiatives will act as a signal to industry that California is not steadfast on its position on zero-emission vehicles, which will result in investment dollars moving elsewhere. It is essential that any proposed changes to California's ZEV regulations be carefully considered in the context of broader California state goals as well as the ripple effect such modifications might have in other states, regions and countries.

UTC Power is pleased to have an opportunity to offer comments on the ARB Staff recommendations for the proposed amendments to the California Zero Emission Vehicle Program Regulations. We look forward to additional opportunities to provide input on these important matters in the future. If there are questions regarding this document or the issues addressed, please feel free to contact me.

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