



Potential 15-Day Changes to the Amendments to the Regulation on the Commercialization of Alternative Diesel Fuels, Approved on April 23, 2020

JUNE 4, 2020

WORKSHOP/WEBINAR

Agenda

- Alternative Diesel Fuels (ADF) Regulation - Background
- Board Meeting Update
- Potential Modifications
 - ADF Formulation
 - ADF Certification Test
- Next Steps



ADF Regulation - Background

- ADF Regulation governs the introduction and use of alternative diesel fuels, and was adopted in Sept 2015
- ADF Regulation also contains **In-Use Requirements** to control potential NOx emissions increase from biodiesel use, which became effective January 1, 2018
- Confirmatory testing led to ADF Amendments proposal released in January 2020
- Amendments approved at Board Meeting April 23, 2020

Resolution 20-2

- Board approved for adoption amendments at the Board Meeting on April 23, 2020.
- Board directed the Executive Officer to determine if **additional conforming modifications** to the regulation are appropriate.
- Board also directed that the modified regulatory language be made available for public comment, with any additional supporting documents and information.

Potential Additional Conforming Modifications

Board members supported the Executive Officer exploring potential modifications on the following areas of the Amendments:

- Under section (a)(1)(B)1, Renewable Hydrocarbon Diesel/Biodiesel formulation provided for public use
- Under section (a)(2)(F)2, Requirement for certification testing at two independent emission test facilities

Importance of ADF Public Formulation Blend Level

- ADF regulation aims to preserve or enhance emissions benefits of existing fuels regulations
- ADF regulation designed so that RD NO_x reductions will offset NO_x increases from lower blends of BD
 - BD at all blend levels capable of increasing NO_x
 - BD below the NO_x control level allowed without additional mitigation due to “offsetting factors” including NO_x reductions from RD
- Selection of appropriate ADF formulation RD/BD blend level ensures availability of RD to serve as offsetting factor and overall NO_x equivalence of ADF program

Staff Analysis of Future NOx Emissions: Methodology

- Quantitative analysis of four scenarios for 2020 - 2023

Scenario	ADF Formulation Blend Level	Renewable Diesel Volume	Biodiesel Volume	Total Diesel Demand
A	N/A	LCFS Illustrative Compliance Scenario	LCFS Illustrative Compliance Scenario	LCFS Illustrative Compliance Scenario
B	R75/B20		Maximize BD Volume	
C	R55/B20			
D	R40/B20			

- Qualitative analysis based on historical and potential future volume trends

Staff Analysis of Future NOx Emissions: Assumptions & Considerations

- BD blends above B5 mitigated by ADF public formulation
- Emission factor based analysis: B20 results in 4% increase in NOx; R100 results in 10% decrease in NOx
- No NOx increase from biodiesel use in NTDEs
- NOx reductions from use of RD offset NOx increases from BD blends B5 and lower

Conclusions of Staff Analysis

- Public formulations with blend levels lower than R55/B20 could result in statewide NOx increases
- R55/B20 public formulation results in NOx equivalence except under conservative scenarios
- Risk of future NOx increases associated with use of R55/B20 public formulation can be addressed with additional modifications to ADF amendments

Staff Proposal for ADF Public Formulation

- Add R55/B20 (2.75:1) as approved formulation for public use
- No certification of formulations lower than R55
- Add triennial program review provision
- Authorize Executive Officer to adjust formulation blend level based on program review



Add R55/B20, No Certification of Formulations Lower Than R55

- R55/B20 results in overall ADF program NOx equivalence under most scenarios
- Formulations certified to NOx equivalence on a per-gallon basis do not provide RD to offset NOx from B5 and lower blends
- Formulations with lower RD blend levels increase chance of high BD volumes leading to NOx increases

Add Provisions for Triennial Program Review & Blend Level Revision

- Monitor statewide NOx emissions associated with biomass-based diesel
- Authorize Executive Officer to potentially adjust ADF public formulation blend level, as appropriate, ensuring continued overall NOx equivalency
- NOx analysis indicates likely no net increases in NOx if current volume trends persist; however, BD supply nationwide sufficient to quickly increase BD volumes



Consideration of Single-Engine Certification Testing

- Executive Officer Discretionary Approval of Single-Engine B20 ADF Certification Testing, Based on Multiple-Lab Engine Emission Testing

Objectives of Amendments to Certification Testing Requirements

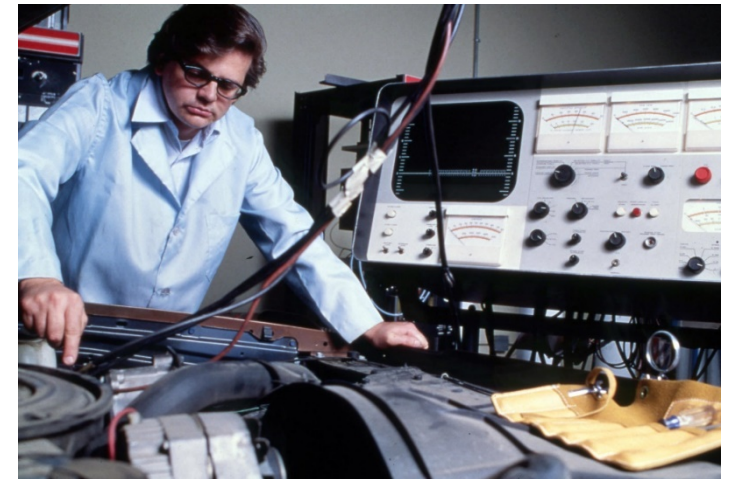
Reinforce the certification testing requirements to ensure the efficacy of NOx-mitigating additives by implementing

- New “chain of custody” requirements
- All fuel property testing at single independent laboratory
- New fuel blending and emission testing observation
- New two-engine, two Diesel Test Fuel testing requirements

Single-Engine Acceptability

Potential adjustment based on approved test plan and NOx and PM emissions data from multiple test facilities

- Stakeholder led process, test protocol must be approved by CARB
- Min. three test facilities must participate
- Same Diesel Test Fuel and B20 fuel
- Test protocol to follow certification reqt's



Single-Engine Acceptability Criteria

- ✓ The engine with the largest B20 to Diesel Test Fuel relative NOx increase approved as baseline
- ✓ Any other engine with percent relative NOx increase within 1 percent of baseline
- ✓ Conservative criteria to ensure approved additives are NOx protective

Single-Engine Acceptability Example

EXAMPLE OF SINGLE TEST ENGINE ACCEPTABILITY		
Engine	Single Engine Acceptability Testing	
	NOx Increase	✓ or ✗
1	6.61 %	✓
2	6.60 %	✓
3	5.61 %	✓
4	5.60 %	✗

Single-Engine Quality Control

- ✓ Engines that pass the acceptability criteria will be held to a quality control standard for PM emissions
- ✓ PM emissions for single engine tests would need to be within 2 percent of the PM emissions from their acceptability testing or the certification would not be considered valid

Single-Engine Quality Control Example

EXAMPLE OF SINGLE ENGINE QUALITY CONTROL			
Engine	Single Engine Acceptability Testing	Certification Testing	
		PM Decrease	✓ or ✗
1	24.69 %	22.69 %	✓
1	24.69 %	22.68 %	✗
1	24.69 %	26.69 %	✓
1	24.69 %	26.70 %	✗

Next Steps

- Comments by June 18 on today's webinar material to adf@arb.ca.gov
- Targeting 15-Day Change Notice Release in June



Thank You