



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

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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.

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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

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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 NOx reductions will offset NOx increases from lower blends of BD
 - BD at all blend levels capable of increasing NOx
 - BD below the NOx control level allowed without additional mitigation due to “offsetting factors” including NOx reductions from RD
- Selection of appropriate ADF formulation RD/BD blend level ensures availability of RD to serve as offsetting factor and overall NOx equivalence of ADF program

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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

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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

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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

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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



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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

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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



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Consideration of Single-Engine Certification Testing

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

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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

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Single-Engine Acceptability

Potential adjustment based on approved test plan and NO_x 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



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Single-Engine Acceptability Criteria

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

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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 %	×

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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

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Single-Engine Quality Control Example

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

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Next Steps

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

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Thank You