

The background features a large, faint watermark of the Environmental Protection Agency (EPA) logo. The logo is circular and contains the text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY" around the perimeter. In the center of the logo is a stylized flower with three leaves and a scalloped top.

Diesel Engine Compliance Center

EMA Certification Workshop

April 19-21, 2022

Allen Duncan, Director,

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**Diesel Engine Compliance Center
Allen Duncan, Director**

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Nydia Yanira Reyes-Morales
Melvis Strickland
Larry Oeler**

AA Office

**Allen Duncan
Steve Healy
Peter Smith
Ron Schaefer
Marie St. Peter
Lauren Steele
Ryleigh Wright
Houshun Zhang**



Certification Assignments

HD On-Highway Engines and Vehicles*

- Steve Healy (Team Lead)
- Ron Schaefer
- Peter Smith
- Lauren Steele
- Houshun Zhang
- Ryleigh Wright
- Marie St. Peter

Nonroad

- Steven Debord
- Peter Smith
- Melvis Strickland
- Ryleigh Wright
- Houshun Zhang
- Nydia Yanira Reyes-Morales
- Larry Oeler

Marine

- Lauren Steele (Team Lead)
- Peter Smith
- Lauren Steele
- Melvis Strickland
- Marie St. Peter
- Ryleigh Wright
- Larry Oeler

*Including IMO

Locomotive

- Peter Smith
- Ryleigh Wright

**Sector Lead
Contact



DECC Contacts by Topic

Compliance Reporting (ABT, PLT, etc.)	Your certification representative
Confirmatory Testing	Ryleigh Wright, Peter Smith, Marie St. Peter
Emission Defect/Recall Reporting	Your certification representative
HD On Highway In-Use Testing Program	Marie St. Peter, Larry Oeler
HD On Highway Vehicles Certification and Compliance	Steve Healy, Houshun Zhang
HD On Highway Engines Certification and Compliance	Ron Schaefer, Houshun Zhang
Locomotive In-Use Testing Program	Ryleigh Wright, Peter Smith
TPEM Program	Yanira Reyes – Morales, Melvis Strickland
TPEM Hardship Relief	Allen Duncan
Selective Enforcement Audits	Peter Smith, Ryleigh Wright, Marie St. Peter
Marine CI Certification and Compliance	Lauren Steele, Steve DeBord
Nonroad CI Certification and Compliance	Peter Smith, Steve DeBord



DECC Contact Information

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Compliance Reporting and COVID 19

- EPA Guidance Issued, CD-2020-05
- https://iaspub.epa.gov/otaqpub/display_file.jsp?docid=49390&flag=1
- “If you are unable to meet the compliance deadline because of COVID-19 impacts, we ask that you instead submit a placeholder document through the EV-CIS system. Please submit the same type of compliance document that is due, but instead of the compliance information that you would normally report, explain in the document your inability to report the compliance information. Additionally, you may also contact your EPA certification representative to explain any extenuating circumstances.”



EV-CIS Module Updates

- HD Vehicles and Engines ABT and Production Volume
- Marine CI Production Volume
- Upcoming: NRCI and Locomotive Production Volume



Relevant Solicitations for Comment

- Within the recent HD On Highway proposal:
 - CBI Class Determination
 - Marine PLT
 - Updates to adjustable parameter language
 - Exemptions
 - DFs for NRCI
 - Changes in Annual Reporting timing requirements
- www.regulations.gov/docket/EPA-HQ-OAR-2019-0055



Certification Focus

- Certification review for new engine families in all sectors, emphasizing the following:
 - DF Validation for Tier 4 > 56 kW and on-highway, DF Carry-Across proposals
 - Continued oversight on screening AECDs for defeat devices



AECD Reviews

- Reviewing AECDs is often the most time-consuming components of certification
- To facilitate screening process:
 - Be sure all AECDs are disclosed
 - Develop one comprehensive document that represents all AECDs
 - Describe AECDs that are present in every engine family you plan to certify
 - For an individual certification application, “gray-out” those AECDs which do not apply
 - Use the template found at the end of guidance letter CCD-04-12 (June 15, 2004) for reporting each AECD and provide thorough information to support your statements



AECD Reviews, cont'd

- Group AECDs by justification that they are not defeat devices:
 - Those that do not reduce the effectiveness of the emission controls
 - Those that are substantially included in the applicable test procedures
 - Those that are necessary to prevent engine damage
 - Those that are active only during starting of the engine
 - Those that are a part of the design for engines installed in emergency vehicles/equipment
- Familiarize yourself with past Agency guidance on the topic, including VPCD-98-13 and CCD-01-02
- Err on the side of disclosure



Carryover Engine Families

- Manufacturers routinely submit running changes after certification and certify the same family as a carryover in subsequent years
- For carryover engine families, it's helpful for manufacturers to identify any changes from the previous model year
 - Time is wasted in the review process if we have to determine for ourselves what has changed from one model year to the next
 - Creates challenges later if we find issues with a significant running change that has not been thoroughly vetted
- When submitting running changes, we encourage you to also communicate with your EPA contact about the submittal outside of Verify



Certification Data

- Posting of Manufacturer Certification Data
 - Using Class Determination (CD-13-05 – Class Determination of Confidential Business Information) to organize and expand the certification data we currently post on EPA’s website:
<https://www.epa.gov/compliance-and-fuel-economy-data/engine-certification-data>
 - Certification data for all industries is posted on a quarterly basis (January, April, July, and October)
 - Data is not posted until the manufacturer-submitted “Introduction into Commerce” date has passed



Manufacturer Compliance Reporting

- Data will be reviewed in conjunction with certification applications
- Failure to report may result in:
 - Referral of violation to OECA for possible assessment of civil penalties
 - Revocation, suspension, or voiding of current or prior model year certificates
 - Delay issuance of new certificates
- Information contained in reports is used to make stand-alone compliance determinations (e.g., PLT and ABT), to prioritize compliance oversight activities, and as a data source to assess rule effectiveness
- Refer to CISD-10-17 (September 3, 2010)



EPA Compliance Testing

- Compliance testing program continues with goal to:
 - Ensure benefits stated in rulemakings are reflected in real world operation
 - Address level playing field issues for all market participants
 - Address compliance issues for new and in-use engines



EPA Compliance Testing

- Compliance testing and analysis will utilize all of the available tools, including:
 - Confirmatory tests
 - Selective enforcement audits
 - General laboratory and records audits
 - In-use data evaluation from manufacturer and EPA test programs
 - Informal site visits
- Important that manufacturers submit certification and production plans
 - Ensures timely selection and performance of compliance testing
 - See CD-13-06 (March 2013) for further instructions
- Also important that manufacturers maintain up-to-date contact information in Verify



Emission-Related Defects and Voluntary Recalls

- Part 1068 –
 - <https://www.epa.gov/ve-certification/report-forms-and-guidance-defects-and-recalls-under-40-cfr-part-1068-subpart-f>
- Please keep your certification representative informed of submissions! (F J Hamady has retired!)



Transition Program for Equipment Manufacturers

- TPEM has ended. Please direct any questions to my email address
- Web site
 - See <https://www.epa.gov/vehicle-and-engine-certification/transition-program-equipment-manufacturers-tpem>
 - Resource for program participants
- Hardship relief
 - Equipment manufacturers in need of hardship relief should be referred to <https://www.epa.gov/vehicle-and-engine-certification/hardship-relief-participants-transition-program-equipment>



Heavy-Duty Vehicle and Engine GHG Compliance Report

- October, 2021: EPA issued the first HD Vehicle and Engine GHG compliance report, model years 2014 – 2018
- Intend to issue updated version during fourth quarter of 2022
 - Available at: <https://www.epa.gov/compliance-and-fuel-economy-data/epa-heavy-duty-vehicle-and-engine-greenhouse-gas-emissions>

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April 20, 2022



Transmission and Axle Selective Enforcement Audits SEA Provisions: Subpart E of 40CFR 1068

- During second quarter, 2022, we expect to issue test orders for axle/transmission SEAs.
- <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-U/part-1037/subpart-D/section-1037.320>
- Unexpected issues with EV-CIS PV report submission have delayed this (more on slide 26)



Transmission and Axle Selective Enforcement Audits SEA Provisions: Subpart E of 40CFR 1068

I. Initiation

- A. EPA determines to test a component (transmission or axle) per 40 C.F.R. § 1037.320
 - 1. EPA selects the component manufacturer (“supplier”) to be tested
 - 2. EPA selects the OEM that will be the SEA regulatee
 - 3. EPA notifies OEM of component SEA
 - a. EPA selects the component model from internal data or from OEM-provided sales volume for selected supplier
 - 4. EPA notifies OEM of the component model to be tested. EPA may choose to select test facility
- B. OEM notifies supplier of the SEA and the model that will be tested
 - 1. OEM and supplier determine test facility for the SEA
 - 2. OEM and supplier determine timing for physical component selection from supplier production line/inventory/service inventory in a manner that minimizes potential production disruptions
 - 3. OEM and supplier agree on test plan
 - 4. OEM and supplier determine timetable for degreening and testing
- C. EPA, OEM and supplier agree on test plan, including test facility
- D. EPA, OEM and supplier agree on timetable



Transmission and Axle Selective Enforcement Audits

SEA Provisions: Subpart E of 40CFR 1068

II. Power Loss Map Creation

- A. Supplier selects physical component and transports to test facility
- B. Supplier degreases the component
- C. EPA performs test cell audit of calibrations and measurements
- D. EPA, OEM and supplier witness component testing/loss map data generation
- E. Supplier compiles loss map file



Transmission and Axle Selective Enforcement Audits

SEA Provisions: Subpart E of 40CFR 1068

III. GEM Assessment

- A. EPA and OEM determine the applicable weight class and subcategory that will be used for SEA (see, 40 C.F.R. § 1036.540 for available choices)
- B. EPA and OEM determine chassis configurations (using good engineering judgement and/or OEM data). Manufacturer provides to EPA compliance margin values utilized in certification process. EPA accepts values subject to good engineering judgment.
- C. EPA and OEM determine GEM inputs
 - 1. Regulated inputs from 40 C.F.R. § 1036.540 and § 1037.320
 - 2. Use the applicable default engine map defined in Appendix III of 40 CFR 1036 (note: Appendix I in FRM)
- D. EPA/OEM submits and completes a GEM run for each applicable chassis configuration as defined in § 1036.540
 - 1. For certification (declared) power loss map
 - 2. For SEA power loss map
- E. EPA and OEM compare results



Transmission and Axle Selective Enforcement Audits

SEA Provisions: Subpart E of 40CFR 1068

III GEM Assessment Cont'd

F. EPA Compliance Determination

1. If SEA GEM results are equal to or lower numerically than declared GEM results, including OEM vehicle compliance margin per the method identified in III. B. for every applicable vehicle configuration, the component passes, thus the family passes and no further testing required
2. If SEA GEM results are higher numerically than declared GEM results, including OEM vehicle compliance margin per the method identified in III. B. for one or more of the applicable vehicle configurations, the component does not pass. The OEM and supplier must repeat the process with two more components of the same or different model within the same family
 - a. Individual data points in the three SEA power loss data files are used to derive the new component power loss map(s) using good engineering judgment
 - b. All maps analytically derived from the original certification map must also be revised accordingly
 - c. New power loss map must be used by that OEM for end-of-year reporting
 - d. EPA may require other OEMs that utilize the same component to conduct a GEM assessment (per III.) using the new power loss map to determine compliance
 - e. Since the new power loss map becomes the official test result for the OEM, 40 C.F.R. § 1037.301(e) is not applicable.



Transmission and Axle Selective Enforcement Audits, continued

- Typical SEA Timeline:
 - Q2: Contact OEMs for Q/A interaction
 - Q2: Delivery of Test Order to OEM
 - Q2: Initial meeting with OEM and axle/transmission manufacturer
 - Q3: Regular meetings with component and/or OEM
 - Q4: Lab audit, component test and SEA completion



Production and In-Use Tractor Testing 40CFR 1037.665

- DECC appreciates the proposed spreadsheet:

The screenshot shows an Excel spreadsheet with the following data:

Test Vehicle Information				
VIN	*****101	*****102	*****103	*****104
Vehicle Family Name	MEPA2TRACCZZZ	MEPA2TRACCCYY	MEPA2TRACCXXX	
Regulatory Subcategory	T8HRSC	T8HRDC	T8MRDC	
GVWR (lbs)	65000	65000	65000	
ETW (lbs)	55000	57000	61000	
Vehicle Weight (lbs)	17000	19000	15000	
Payload (lbs)	38000	38000	46000	
Payload (tons)	19	19	23	
A Coeff. (lb)	300	315	320	
B Coeff. (lb/mph)	0	0	0	
C Coeff. (lb/mph ²)	0.15	0.22	0.29	
Fuel Type	ULSD	ULSD	ULSD	
Test Date	1/1/2022	1/2/2022	1/3/2022	
Results Summary (grams/hr)				
THC				
CH4				
NMHC				
NOx				
CO				
CO2				
N2O				
PM				



Production and In-Use Tractor Testing 40CFR 1037.665

- The request for consideration of test articles that had associated coast-down data proposed since such test articles would have the greatest degree of certainty and accuracy associated with the A,B and C coefficients.
- We recognize that such test articles are not common and that few of the five selected articles will have coast-down data



Aerodynamic Testing – Selective Enforcement Audits

- We expect to conduct Coastdown Tests Q2, 2023 at Kennedy Space Center. (40CFR 1037.305)
- What do we envision?
 - EPA identifies tractors of interest
 - EPA contacts vehicle OEMs for discussion (Q4, 2022)
 - EPA delivers Test Order to OEM (Q1, 2023)
 - Testing by SwRI at KSC late Q2 or early Q3, 2023



Phase 2 Readiness

- EMTC/EPA Phase 2 Engine Round Robin Update.
- Working to ensure MY 2024 and beyond test labs have consistent processes and lab to lab variation is understood
- Preparing for MY '24 and beyond confirmatory tests at EPA NVFEL



Phase 2 Readiness, EMA EMTC Round Robin

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
1	GHG Round-Robin Phase I Program Schedule		2022												2023												
2	HHD - Daimler MY2020 DD15		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
3	Daimler		█	█																							
4	SwRI/Navistar				█	█	█																				
5																											
6	Cummins									█	█																
7	PACCAR											█	█														
8	Volvo														█	█											
9	EPA																		█	█	█						
10																											
11																											
12	GHG Round-Robin Phase II Program Schedule		2022												2023												
13	MHD - Cummins ISB 6.7		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
14	Cummins		█	█	█	█																					
15	SGS						█	█																			
16																											
17																											
18																											
19	Ford														█	█											
20																											
21																											
22	EPA																										



Diesel Engine Compliance Center

EMA Certification Workshop
NRCI/Marine/Locomotive Breakout
Session

April 20, 2022



Marine CI DF Validation

- Guidance letter CD-2022-02 issued January 31, 2022
- MCI manufacturers with certified SCR-equipped families should prepare a DF validation plan this year. A pre-certification meeting would be an excellent opportunity to begin this dialogue with EPA.
 - Includes Category 1 and 2 engines relying on SCR to meet Tier 4 as well as any designs that rely on functioning of the SCR to meet EPA Tier 3
 - Includes families that have ceased or will soon cease new production (ending carryover).
- No specific deadline by which testing must be complete.
- When developing DF determination plans for new (not carryover) families, please share ideas regarding future ideas for validating that family. State if DF's are carried-across and validation will occur in the source family. If new data will be needed for validation, please share a proposed DF validation plan prior to the 2nd year of certification.



Tier II EIAPP certificates for commercial engines < 600 kW

- DECC will continue to issue Tier II EIAPP certificates requested for commercial engine families not subject to Tier 4 and not meeting IMO Tier III.
- We will continue to expect OEM's to employ corporate controls to ensure the engines aren't installed in new commercial vessels traveling internationally without separate vessel-specific exemption (see Annex VI Regulation 13.5.2.2).
 - No separate exemption needed to install in recreational vessels or older boats as replacement engines
- EPA will quickly review and approve any legitimate request for vessel-specific exemption for use with new commercial vessel (total propulsion between 1 kW & 750 kW).



Marine Replacement Engine Reports

- 40 CFR 1042.615 was revised in 2021 (86 FR 34511, June 29, 2021)
- Annual reporting to EPA on marine replacement engines (not monthly)
 - Report of engines sold under 1042.615 in CY2021 due by 9/30/22
- Draft data elements posted on web page: <https://www.epa.gov/ve-certification/compliance-reporting-marine-compression-ignition-ci-engines>
 - EPA seeks EMA member input on best approach for EPA to collect this information
- Distinct requirement from multi-industry report under 1068.240
 - EPA seeks ideas on streamlining these two reports



Electronic Labeling of Locomotives

- Engaged with AAR and Locomotive manufacturers/remanufacturers to develop pilot program (alternate labeling proposal)
- Locomotives are unique (captive, inventoried 24/7/365)
- Third party would maintain database that allows continuous real time access.
- Has not received final approval



NRCI : Reporting CO₂, N₂O and CH₄ in EV-CIS

- **Reminder of 1039.235:** (g) Measure CO₂ and CH₄ with each low-hour certification test using the procedures specified in [40 CFR part 1065](#) in the 2011 and 2012 model years, respectively. Also measure N₂O with each low-hour certification test using the procedures specified in [40 CFR part 1065](#) starting in the 2013 model year for any engine family that depends on NO_x aftertreatment to meet emission standards. Small-volume engine manufacturers may omit measurement of N₂O and CH₄. These measurements are not required for NTE testing. Use the same units and modal calculations as for your other results to report a single weighted value for each constituent. Round the final values as follows:
 - (1) Round CO₂ to the nearest 1 g/kW-hr.
 - (2) Round N₂O to the nearest 0.001 g/kW-hr.
 - (3) Round CH₄ to the nearest 0.001g/kW-hr.

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EMA Certification Workshop

OBD

April 21, 2022



“Federal Only” OBD Approvals

- EPA will review requests for approval for Federal Only OBD approvals
- EPA will focus on marginal differences for these systems when compared to legacy approvals and/or CARB approvals
- EPA requests that manufacturers provide general, systemic descriptions but focus on marginal differences
- EPA will leverage available CARB support
- Early discussions will be critical



OBD Demonstration Guidance for MY 2022

- Guidance issued 26 April:
- https://iaspub.epa.gov/otaqpub/display_file.jsp?docid=52574&flag=1
 - Contact DECC staff to discuss
- Is additional guidance requested