

Appendix G

Public Process – Additional Meetings

APPENDIX G

LIST OF ACRONYMS AND ABBREVIATIONS USED IN APPENDIX G

Acronym or Abbreviation	Description
AQMD	Air Quality Management District
ATA	American Trucking Association
AVE	Alliance for Vehicle Efficiency
CALCIMA	California Construction and Industrial Materials Association
CARB	California Air Resources Board
CATI	Clean Air Technology Initiative
CE-CERT	Center for Environmental Research & Technology
CLEERS	Crosscut Lean Exhaust Emissions Reduction Simulations
CNG	Compressed Natural Gas
DEEM	Dynamic Emissions and Energy Management
DEF	Diesel Exhaust Fluid
DyMMS	Dynamic Mobility Management System
EJ	Environmental Justice
EMA	Truck and Engine Manufacturers Association
EU	European Union
FTP	Federal Test Procedure
FUL	Full Useful Life
GHG	Greenhouse Gas
JRC	European Commission Joint Research Center
LADCO	Lake Michigan Air Directors Consortium
MARAMA	Mid-Atlantic Regional Air Management Association, Inc.
MECA	Manufacturers of Emission Controls Association
MJO	Multi-Jurisdictional Planning Organization
MOVES	MOtor Vehicle Emission Simulator
NACAA	National Association of Clean Air Agencies
NESCAUM	Northeast States for Coordinated Air Use Management
NOx	Oxides of Nitrogen
NREL	National Renewable Energy Laboratory
OP	Opposed-piston
PEMS	Portable Emissions Measurement Systems
PSPD	Particle Sensor Performance and Durability
RMC	Ramped Modal Cycle
SCRf	Selective Catalytic Reduction on Filter
SwRI	Southwest Research Institute
USA	United States Of America
U.S. EPA	United States Environmental Protection Agency

APPENDIX G

Southwest Research Institute Low Oxides of Nitrogen Demonstration Program Advisory Group Meetings

Date	Topics Discussed
10/16/2013	Kick-off meeting for the Southwest Research Institute (SwRI) Stage 1 Low Oxides of Nitrogen (NOx) Program contract titled "Evaluating Technologies and Methods to Lower Nitrogen Oxide Emissions from Heavy-Duty Vehicles."
5/1/2014	Low NOx program project update, aftertreatment technology options, proposed aftertreatment aging methods, and general engine management strategies.
10/31/2014	Low NOx program project update, vocational cycle development, diesel engine baseline test results, proposed diesel technology screening, proposed diesel engine calibration approaches and natural gas engine status update.
6/23/2015	Low NOx program project update, selection of final engine and aftertreatment control strategies, final calibration of engines with the selected strategies, and Truck and Engine Manufacturers Association (EMA) measurement study objectives and interim findings.
8/20/2015	Low NOx program project update, diesel engine management strategies, diesel aftertreatment control technology screening, and natural gas engine baseline test results.
12/4/2015	Low NOx program project update, natural gas engine status, diesel engine calibration, and diesel aftertreatment screening.
2/29/2016	Low NOx program project update, diesel engine cold-start calibration, diesel emissions system screening, impact of regeneration and frequency of regeneration (in person meeting at SwRI facilities in San Antonio, Texas).
8/24/2016	Low NOx program project update, aftertreatment technology ranking and final configuration selection, refinement of the final configuration, diesel aftertreatment aging and Selective Catalytic Reduction Coated on Filter (SCRF) regeneration frequencies, and Compressed Natural Gas (CNG) final configuration and aftertreatment aging.
2/16/2017	Program overview, diesel final aging, summary of final aged parts, assessment of final aged parts (Federal Test Procedure [FTP], Ramped Modal Cycle [RMC], California Air Resources Board [CARB] Idle), vocational cycle data, areas of further work, follow on program efforts: Stage 2 and Stage 3.

APPENDIX G

6/27/2017	Analysis approach and methodology taken in developing low-load engine cycle profiles, and present some preliminary results, technical update on low load profile and cycle development (National Renewable Energy Laboratory [NREL]).
2/22/2018	Stage 2: project update, low load cycle development update, low load vehicle profiles, analysis, example profiles, and next steps.
7/17/2018	Stage 2: project status, low load cycle development, review of vehicle profile development and selection, vehicle profile translation to engine cycles, final low load profiles, low load profile testing – engine testing, low load cycle approach, and next steps.
12/6/2018	Program status update, Stage 2: low load profile development, low load profile testing review, classification of low load profile challenges, low load cycle development approach, preconditioning, cycle options and development data, and final low load cycle candidates.
5/30/2019	Stage 1b: Full Useful Life (FUL) aging re-evaluation, Stage 2: low load cycle status update, low load cycle calibration of stage 1/1b test article, low load in-use metric development, and Stage 3: status and next steps.
8/27/2019	Stage 1b: FUL aging re-evaluation - updates with final baseline, Stage 2: low load cycle status update, low load cycle calibration of Stage 1/1b test article, low load in-use metric development support, and Stage 3: status and next steps.
3/26/2020	Stage 3: low NOx demonstration program results.

CARB Presentations in Meetings/Workshops/Conferences

Date	Topics Discussed
10/20/2016	Natural Gas Vehicle Technology Forum, San Francisco, CA
10/26/2016	Integer Emissions Summit and Diesel Exhaust Fluid (DEF) Forum, Chicago, IL
12/6/2016	NRELs California Research Review
1/19/2017	South Coast Air Quality Management District (AQMD) Clean Fuels Advisory Board, Diamond Bar, CA

APPENDIX G

2/17/2017	Coordinating Research Council's Mobile Source Air Toxics Workshop, Sacramento, CA
3/27/2017	Coordinating Research Council's Real World Emissions Workshop, Long Beach, CA
3/27/2017	Manufacturers of Emission Controls Association (MECA) annual membership meeting with CARB, El Monte, CA
3/30/2017	University of California Riverside Center for Environmental Research & Technology (CE-CERT) Portable Emissions Measurement Systems (PEMS) Workshop, Riverside, CA
5/4/2017	Advanced Clean Transportation Expo, Long Beach, CA
5/8/2017	Associated General Contractors, California Chapter, Joint Engineering Division Meeting, Sacramento, CA
5/16/2017	Southwest Research Institute's 1st Exhaust Gas Sensors Symposium
5/17/2017	Low NOx briefing for MECA, El Monte
7/13/2017	Clean Air Technology Initiative Meeting (CATI)
7/17/2017	Crosscut Lean Exhaust Emissions Reduction Simulations Meeting (CLEERS)
9/18/2017	SAE COMVEC, Chicago, IL
9/19/2017	HORIBA-CARB Technical Exchange meeting, Irvine CA
10/18/2017	AVL-CARB Technical Exchange meeting, Diamond Bar, CA
11/7/2017	Integer Emissions Summit United States Of America (USA), Pittsburg, PA
1/30/2018	Horiba Instruments CONCEPT Conference, Riverside, CA
2/5/2018	University of California Riverside CE-CERT's Dynamic Emissions and Energy Management (DEEM) Workshop, Riverside, CA
2/9/2018	Kick-off Meeting for Calstart/Achates Class 8 Engine demonstration, teleconference.
3/19/2018	Coordinating Research Council's Real World Emissions Workshop (poster), Garden Grove, CA
3/29/2018	Achates Power Advanced Combat Engine Program Review, San Diego, CA
5/3/2018	Advanced Clean Transportation Expo, Long Beach, CA
5/8/2018	California Construction and Industrial Materials Association (CALCIMA), Ontario CA

APPENDIX G

5/24/2018	CARB-MECA Meeting, Sacramento, CA
6/19/2018	2nd Sino- European Union (EU) Workshop on New Emissions Standards for Motor Vehicles, Brussels, Belgium
7/13/2018	CARB- European Commission Joint Research Center (JRC) Meeting, El Monte, CA
9/11/2018	SAE COMVEC, Rosemont, IL
9/25/2018	MECA annual membership meeting with CARB, A, El Monte, CA
11/7/2018	Achates Power Opposed Piston Engine Symposium, San Diego, CA
11/8/2018	CalStart Low NOx/Low Greenhouse Gas (GHG) Class 8 Engine Demonstration Project Press Event, San Diego, CA
11/8/2018	Low NOx Working Group, San Diego, CA
3/1/2019	Northeast States for Coordinated Air Use Management (NESCAUM), teleconference
3/14/2019	University of California Riverside CE-CERT PEMS Conference, Riverside, CA
3/25/2019	National Association of Air Quality Agencies' Fuels and Mobile Sources Committee Meeting, teleconference
4/4/2019	SAE Government Industry Meeting, Washington, D.C.
4/5/2019	SAE Government Industry Meeting, Washington, D.C.
4/9/2019	EMA Certification Workshop, Chicago
4/18/2019	University of California Riverside CE-CERT Dynamic Mobility Management System (DyMMS) Workshop, Riverside, CA
5/21/2019	MECA annual membership meeting with CARB, El Monte, CA
5/29/2019	Lake Michigan Air Directors Consortium (LADCO), teleconference
5/29/2019	NESCAUM, teleconference
6/5/2019	University of Wisconsin, Madison, Engine Research Center 2019 Symposium, Madison, WI
7/10/2019	Southwest Research Institute 2nd Exhaust Gas Sensors Symposium (in conjunction with SwRI Particle Sensor Performance and Durability [PSPD] Consortium), San Antonio, TX by remote participation
7/18/2019	Mid-Atlantic Regional Air Management Association, Inc. (MARAMA) Multi-Jurisdictional Planning Organization (MJO) Motor Vehicle Emission Simulator (MOVES) Committee call, teleconference

APPENDIX G

7/23/2019	National Association of Air Quality Agencies' Fuels and Mobile Sources Committee Meeting, teleconference
7/25/2019	Biodiesel Stakeholders Conference Call, teleconference
9/11/2019	SAE COMVEC19, Rosemont IL
9/17/2019	United States Environmental Protection Agency (U.S. EPA) Mobile Source Technology Review Subcommittee, Ann Arbor, MI
9/18/2019	National Association of Clean Air Agencies (NACAA) Mobile Sources and Fuels Committee/U.S. EPA, Ann Arbor, MI
10/3/2019	Calstart/ Alliance for Vehicle Efficiency (AVE) Ultra Low NOx Working Group, Sacramento, CA
10/6/2019	American Trucking Association (ATA) Meeting, San Diego, CA
10/14/2019	CARB update for EU Joint Research Center staff, El Monte, CA
10/29/2019	Integer DEF Forum USA, Scottsdale, AZ
11/7/2019	Achates Power Heavy Duty Opposed-piston (OP) Engine Program Review, San Diego, CA.
11/14/2019	CATI, teleconference
11/19/2019	Integer Emissions Summit USA 2019, Indianapolis, IN
1/7/2020	National Tribal Air Association, teleconference
1/13/2020	Transportation Research Board Annual Meeting, Washington, D.C.
1/16/2020	NACAA Mobile Sources and Fuels Committee, teleconference
1/22/2020	SAE Government/Industry Meeting, Washington, D.C.
2/4/2020	National Parks Conservation Association & San Joaquin Valley Environmental Justice (EJ) groups, teleconference
3/5/2020	CARB/U.S. EPA visit to Aramco/Achates Power/Alliance for Vehicle Efficiency, Novi, MI
4/8/2020	Multi-State Zero Emission Vehicle Taskforce, Teleconference
4/9/2020	NESCAUM Mobile Sources Committee, Teleconference