



Oversight Procedure 38 – Bus and Rail Vehicle Technical Review

1.0 PURPOSE

The purpose of this Oversight Procedure (OP) is to describe the review, analysis, , and recommended procedures and reporting requirements that the Federal Transit Administration (FTA) expects from the Project Management Oversight Contractor (PMOC) as regards the Project Sponsors' procurements of bus and rail vehicles. The review should ensure that the vehicles being procured:

- Are a good fit for the intended use
- Represent good value for the product selected
- Meet the specified requirements
- Include the most appropriate technologies
- Conform to Federal Requirements

For all but the smallest procurements, reviews should be performed at definitive stages of the procurement: 1) Planning and Solicitation, 2) Vendor Selection, 3) Design, Manufacturing and Testing, 4) Acceptance, Commissioning, and Readiness for Revenue Service processes. It is important to evaluate the Project Sponsor's Management Capacity and Capability to be able to successfully manage these processes within stated cost and schedule constraints while meeting the intent of the project scope.

2.0 BACKGROUND

The PMOC's review should occur in conjunction with other related Guidance. Refer to the following OPs when performing this review:

- OP 20 - Project Management Plan Review – including various supporting plans such as Vehicle Maintenance Plans, Operations Plans, and other Plans as applicable
- OP 25 - Recurring Oversight and Related Reports
- OP 35 (If applicable) - ADA (Level Boarding for Commuter Rail)
- OP 36 – Buy America Review
- OP 37 – Fleet Management Plan Review

3.0 OBJECTIVES

The objectives of this review are to ensure that the vehicle procurement is performed in conformance with applicable regulations and guidance, and that process corrections are made in a timely manner involving vehicle specifications, manufacturing approaches, quality and testing processes, commissioning and safety certification in order to meet vehicle program requirements at key stages of the project.

4.0 REFERENCES

The following are the principal, but not the only, references to Federal legislation, regulation and guidance with which the PMOC should review and develop a solid understanding as related to the Project Sponsor's project work being reviewed under this OP:

4.1 Legislative

- The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or SAFETEA-LU, Pub.L. 109-59
- Moving Ahead for Progress in the 21st Century, or MAP-21, P.L. 112-141
- 49 CFR Parts 27, 37 & 38: U.S. Department of Transportation regulations implementing the transportation provisions of the ADA.
http://www.fta.dot.gov/civilrights/ada/civil_rights_5936.html
- 49 CFR Parts 661 & 663 Buy America regulations: This regulation is likely to have a significant impact on the procurement process continuing through the manufacture of the vehicles.
- The Department of Transportation issued Disability Law Guidance, Full-Length, Level-Boarding Platforms in New Commuter and Intercity Rail Stations on September 1, 2005
http://www.fta.dot.gov/civilrights/ada/civil_rights_3890.html

4.2 United States Code

- 49 U.S.C. Chapter 53, specifically, section 5323(j)

4.3 Regulations

- Buy America Requirements, 49 C.F.R. Part 661
- Pre-Award and Post-Delivery Audits, 49 C.F.R. Part 663

4.4 Guidance

- FTA's Buy America Audit Handbooks

4.5 FTA Circulars

- C4220.1F, Third Party Contracting Requirements
- C9030.1D, Urbanized Area Formula Program
- FTA's Best Practices Procurement Manual

5.0 PROJECT SPONSOR SUBMITTALS

In support of this review, the PMOC shall obtain and study the documents listed below. Under 49 U.S.C. 5325, 18 CFR 18.36(i), and 49 CFR 633.17 all supplier submittals are required to be available to the PMOC.

- Environmental Document
- Project Description - Grant Application
- Project (Vehicle) Specifications

- Procurement Solicitations, Technical Responses and Evaluations
- List of Drawings and supporting information on analysis and testing, including proof of design, maintainability, operability, safety, serviceability, and reliability; configuration control and management
- Testing Program Plan
- Quality Assurance and Quality Control Plan for Vehicles (and supporting documents)
- Vehicle History Books
- Safety and Security Certification Plans and Certifiable Items List
- Appropriate standards should be included in the specification by the Project Sponsor to ensure that vehicles comply with all Federal and state regulations. Environmental and performance standards should be explicit and appropriate for the locale.

6.0 SCOPE OF WORK

In performance of the reviews below and following the checklist in Appendix B, the PMOC should report discrepancies and make suggestions for correction as appropriate. The PMOC should then follow up and report on the corrective actions taken by Project Sponsor. The PMOC should pay particular attention to those issues which may be identified in each stage of the procurement process.

- Cost - issues impacting cost as related to the use of technology, deviation from industry accepted designs, contract packaging, and specification enforcement;
- Schedule, issues potentially impacting schedule, and issues actually impacting schedule;
- Vehicle quality and safety issues;
- Vehicle reliability, availability and maintainability;
- Issues impacting vehicle operability;
- Faulty or unreliable vehicle designs or systems;
- Known component or material deficiencies and availability of replacement parts;
- Other, such as payments to vendors (slow or no payments), commonality / compatibility with the existing vehicles, interface issues with other elements of the transit system

6.1 Planning and Solicitation

At this stage of the process the PMOC should review concerns resulting from the NEPA process and the Engineering phase. The PMOC must also review the portions of the procurement process leading up to Vendor Selection using Invitation for Bid (IFB) or two-step procurement or Best Value procurement using competitive negotiations. The review would include Environmental Documents, Project Description –Grant Application, Technical Specifications, any proposed Contract Document Requirement Lists(CDRL), Test Program Plans, Design Drawings and Design Criteria, Quality Assurance Requirements, Technology Assessments, Requests for Expressions of Interest (RFEI), related Environmental Impact Statements (EIS), Contract Terms and Conditions (General Conditions, Special Provisions, Compensation Provisions, Sample Contracts, Bid Forms, Contractor Questionnaires), Requests for Proposals(RFP), Source Selection Procedure, Invitation for Bid (IFB), Instructions to Proposers, Minutes of Pre-Proposal Conferences, or any other documentation that ensures appropriate technological and financially responsible procurement of rolling stock.

The PMOC should evaluate the above documentation and process for impacts as identified above.

- The PMOC shall confirm that the intended vehicle does not potentially conflict with statements in the environmental documents.
- The PMOC shall review the design documents.
- The PMOC shall consider how well the proposed vehicle fulfills the Project Sponsor's stated purpose of the project and complies with applicable statutes and regulations. Consider operational requirements, cost to procure vehicles, maintenance intentions, and prospects for follow-on procurements.
- The PMOC shall review the RFP or Bid package and solicitation and evaluation process including vehicle specification and terms and conditions.

6.2 Vendor Selection

At this stage of the process the PMOC should review the vendor selection process; that would include – review of Contractor Proposals, completed Contractor Questionnaires, any Best and Final Offers, Proposal Evaluations Process, Completed Price Proposal (or Bid) Forms, Proposal Questions and Responses, Pre-award site survey(s), Pre-award Buy America Audit or any other documentation that ensures appropriate technological and financially responsible procurement of rolling stock.

The PMOC should evaluate the above documentation and process for impacts as identified above and to:

- a) determine that the selected vendor meets the qualification requirements
- b) ensure the integrity of the proposal evaluation criteria and process
- c) monitor the contract negotiation process and agreed terms
- d) assure that the contract vehicle options meet the Project Sponsor's needs
- e) verify that a Pre-Award Buy America audit is compliant
- f) monitor any Post-award, Pre-initial Notice to Proceed (NTP) Conference

6.3 Design, Manufacturing and Testing

As part of the review of the Design, Manufacturing and Testing process, the PMOC should review the Project Sponsor's management of and processes for review and approval of the vehicle manufacturer's design, production schedule, materials, subsystems, vendors, QA/QC plans and inspection forms, hold points for Project Sponsor inspections/approvals, First Article Inspection (FAI) procedures and schedule, Vehicle History Book Development, CDRL submission and approval, and the verification of adherence to safety, security, Buy America Audit, and ADA requirements. In addition, for rail vehicles, the PMOC should conduct periodic reviews and oversight of the interface coordination between vehicle design and train control, traction power, communication, track, wayside and related systems design. The PMOC should also review and provide oversight of the Project Sponsor's management of and processes for review and approval of the vehicle manufacturer's qualification and production conformance test plans (including static and dynamic testing), execution of those plans, handling of non-compliant test results, retesting, and acceptance of the vehicle structure, interior, propulsion and braking systems, doors, and all other vehicle systems.

- The PMOC shall review the CDRLs to determine whether they address all of the characteristics to be demonstrated through analysis and testing including proof of design, maintainability, operability, safety, serviceability, and reliability. The PMOC must closely monitor the configuration controls and management to enable ongoing and timely procurement updates and schedule performance.
- The PMOC shall review the Test Program Plan and supporting analysis and testing information to ensure the vehicle and its systems are integrated per specifications, including with the vehicle operating environment elements. The PMOC must assure that, between test and analysis, the supplier will demonstrate full compliance with the Project Sponsor's design specification.
- The PMOC shall review and monitor the Project Sponsor's final Buy America Audit.
- The PMOC shall review the Project Sponsor's QA plan to ensure the vehicle manufacturer and suppliers' QA/QC will be performed under adequate surveillance.

6.4 Acceptance, Commissioning and Readiness for Revenue Service

At this final stage of the vehicle procurement process, the PMOC should review acceptance and commissioning activities and provide oversight related to Project Sponsor's planned management of and processes for receipt of vehicles, static and dynamic (on site) qualification/acceptance testing plans and procedures, identification process for needed modifications and modification management process, systems integration and interface compatibility testing (integrated testing) with civil infrastructure and wayside systems, commissioning and start-up operations testing (including pre-revenue), acceptance and stocking of spare parts, vehicle manufacturer and vendor manuals and training delivery, conditional and final acceptance requirements; warranty management, delivery of Vehicle History Books, and safety and security certification of each vehicle.

- The PMOC shall review the qualification and production conformance test plans to determine whether they address all of the characteristics to be demonstrated through analysis and testing including proof of design, maintainability, operability, safety, serviceability, and reliability. The PMOC must closely monitor the integrated testing process to ensure delivery of a fully functioning transit system within the scope of the project definition.
- The PMOC shall review the vehicle manuals and training programs to ensure the Project Sponsor's preparedness to place vehicles into revenue service and mesh them with other plans to be delivered including the Bus and Rail Fleet Management Plan and the Operations and Maintenance Plan.
- The PMOC shall review the Safety and Security Certification process for all vehicles to ensure compliance to the Safety and Security Implementation Plan and the addressing of all identified items on the Certifiable Items List (CIL).

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with written reports of findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share reports with the Project Sponsor. In the event that differences of opinion exist between the PMOC and the Project Sponsor regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Project Sponsor and provide FTA with a report addendum covering the agreed modifications by the Project Sponsor and PMOC.

The report formatting requirements of OP 01 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

APPENDIX A

Acceptable Quality Level

| | DESIRED OUTCOME | PERFORMANCE REQUIREMENT | CHECK LIST | ACCEPTABLE QUALITY LEVEL | PERFORMANCE MEASURE | MONITORING METHOD |
|---|--|--|------------|---|---|--|
| 1 | PMOC shall review the status of Project Sponsor's procurements of road and rail vehicles. | R1a. The PMOC shall develop and document a process for review and analysis of Project Sponsor's procurements of road and rail vehicles. | | Q1a. Process exists and has been followed. | M1a. Evidence of a documented process that does not duplicate work performed by the sponsor or its consultants. | MM1a. Periodic review by FTA or its agent. |
| | | R1b. The PMOC shall use its process to validate the thoroughness of road and rail procurements at all phases of the project. | | Q1b. Assessment must be made and the PMOC provides internal verification that the process as documented has been followed. | M1b. Documented assessment of road and rail vehicle procurements. | MM1b. Periodic review by FTA or its agent. |
| 2 | The PMOC shall oversee Project Sponsor's procurements of road and rail vehicles to ensure that FTA grants are used to obtain best value. | R2a. The PMOC shall continually assure that FTA's interests are protected economically through review and analysis of Project Sponsor's procurement of intended vehicle for 1) consistency with EIS/EIR, 2) needs identified in Grant Application, 3) compliance with CDRs, 4) assurance that the Test Program Plan demonstrates full compliance with the Sponsors design specification, 5) adequacy of Design Documents and 6) adequacy of the QA Plan. | | Q2b. Professional opinion of compliance through Project Sponsor's submittals protecting FTA's economic interests. | M2b. Documented evidence of a thorough review of Project Sponsor's submittals and design documentation, supported by a professional opinion. | MM2b. Periodic review by FTA or its agent. |
| | | R2b. The PMOC shall continually monitor the status of Project Sponsor's procurements of road and rail vehicles to assure that: 1) The vehicles are a good fit for the intended use, 2) The vehicles represent good value, 3) The vehicles are assured to meet specification requirements and 4) The Project Sponsor has considered the most appropriate technologies. | | Q2c. Professional opinion pertaining to vehicles meeting Project Sponsor needs and specification requirements at appropriate levels of technology. | M2b. Documented evidence of continued monitoring and review, discussion of discrepancies and reporting of intended corrective action, supported by a professional opinion. | MM2b. Periodic review by FTA or its agent. |
| | | R2c. The PMOC shall identify and report areas of Project Sponsor's procurements of road and rail vehicles requiring corrective action and make suggestions for correction as appropriate. | | Q2c. Professional opinion pertaining to corrective actions needed to assure protection of FTA's interests. | M2c. Documented evidence of continued monitoring and review, discussion of needed corrective action with Project Sponsor upon FTA approval and reporting of needed corrective action to FTA, supported by a professional opinion. | MM2c. Periodic review by FTA or its agent. |
| 3 | The PMOC shall document its findings, professional opinions, and recommendations in a report to the FTA. | R3. The PMOC shall present its findings, conclusions, and recommendations to FTA and, upon FTA approval, reconcile those recommendations with the Project Sponsor to the extent possible. | | Q3. Reports and presentations are professional, clear, concise, and well written. The findings and conclusions have been reconciled with other PMOC reports and have been reconciled with Project Sponsor to the extent possible. | M3. PMOC's findings, conclusions, recommendations, and presentation. | MM3b. Periodic review by FTA or its agent. |

APPENDIX B

Bus and Rail Vehicle Technical Review Checklist

| Section | Issue | Description |
|------------|-------|--|
| 6.1 | | Planning and Solicitation |
| | 1 | The PMOC shall confirm that the intended vehicle does not potentially conflict with statements in the environmental documents. Describe any conflicts between environmental documents and intended vehicle and Project Sponsor's intended response. |
| | 2 | The PMOC shall consider how well the proposed vehicle fulfills the Project Sponsor's stated purpose of the project and complies with applicable statutes and regulations as well as fill operational needs. |
| | 3 | Will the specified vehicle fit the Project Sponsor budget and resources available? |
| | 4 | Will additional vehicles be required and if so has the process taken follow-on procurements into account? |
| | 5 | Review draft specification and the final specifications: <ol style="list-style-type: none"> a. Do the payment schedule and the work schedule match? b. Will key technical documents be approved before hardware delivery? c. Can the vehicles be maintained with the resources at the Project Sponsor's disposal? d. Will the specified training program enable the Project Sponsor to perform vehicle operations and maintenance? e. Are adequate measures taken to protect the Project Sponsor in terms of liquidated damages, weight penalties, design conformance, warranty provisions, delivery of "as-built" drawings? |
| | 6 | Review Contract Terms and Conditions: <ol style="list-style-type: none"> a. Are appropriate FTA contract clauses included? b. Have appropriate contract methods been followed to allow for competition and yield the best price for the technology and vehicle chosen? c. Appropriate General Conditions, Special provisions, Technical Provisions identified d. Does the payment schedule (in particular front-loaded payment schedule) adequately leverage compliance with specifications; does it ensure the Project Sponsor holds sufficient retainage at Preliminary Design Review (PDR), Final Design Review (FDR), FAI, Performance Testing, Vehicle Acceptance, and the warrantee period for supplier and sub-suppliers; |
| | 7. | RFP Solicitation: <ol style="list-style-type: none"> a. Was an RFEI distributed? Adequate competition for selected technology/vehicle? b. Pre-proposal conference held/questions answered fully? c. Contractor questionnaire utilized? |
| 6.2 | | Vendor Selection |
| | 1 | PMOC should review contractor technical and price proposals, any bid forms, questionnaires, BAFO, and other related documents to validate open and fair competition as well as technological and financially responsible vendor selection. |
| | 2 | Determine that selected vendor meets specified requirements |
| | 3 | PMOC should monitor negotiation process and agreed terms |
| | 4 | Assure any contract options meet Project Sponsor's needs |
| | 5 | Verify Pre-Award Buy America Audit |
| | 6 | Monitor NTP, post-award conferences |
| 6.3 | | Design, Manufacturing and Testing |
| | 1 | Contract Deliverables Requirements List: Does the CDRL assure that all critical performance issues are adequately analyzed, |

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| | | <p>including:</p> <ul style="list-style-type: none"> a. Structural strength and fatigue resistance of rail vehicle body and truck or bus vehicle frame and chassis b. Brake Performance c. Propulsion performance d. Dynamic performance e. HVAC performance f. Dynamic Envelope, loading gauge, and clearance requirements g. Controls and Interlocks h. Weight Management i. Safety Management j. Reliability Management k. Availability Management l. Maintainability and Mean Time To Repair <p>Does the CDRL schedule assure that performance is proved by analysis before start of sub-assembly production?</p> |
| | 2 | <p>Test Program Plan and Procedures:</p> <ul style="list-style-type: none"> a. Are critical specified performance criteria demonstrated by test, by acceptable analysis, or prior agency certified test? b. Are acceptance tests sufficient to demonstrate that each vehicle is compliant through testing of representative criteria? c. Is the test program valid for the vehicle and the intended infrastructure; for instance, are new vehicle designs on new infrastructure treated to a different approach (a full system test for example), than existing vehicle designs; existing vehicle designs previously tested on the existing infrastructure might only require vehicle testing to assure satisfactory interfacing with the existing infrastructure? d. Do the qualification and acceptance test criteria ensure the vehicles “as delivered” will meet the Project Sponsor’s needs within acceptable boundaries without having to repeat qualification tests? e. Do test procedures refer to applicable sections of the specification? f. Are test procedures up-to-date and do they reflect the latest design configurations? Will the test plan validate all analyses? g. Will the test plan validate performance that has not been analyzed? h. Will the acceptance testing proposed validate production results and fleet performance? |
| | 3 | Does the test plan and CDRL ensure the vehicle will perform on the actual infrastructure? |
| | 4 | <p>Review Design Documents to ensure:</p> <ul style="list-style-type: none"> a. Do the documents address the intended issues? b. Is there a properly sequenced and efficient plan of design to ensure compliance and mitigate against rework? c. Assumptions made are valid and proven d. Analytical methods meet current professional standards e. The Project Sponsor’s review is by persons competent in the field and capable of detecting and commenting on design and analytical errors f. Drawing and configuration control are designed to ensure consistency throughout the fleet, including option orders g. Is PDR consistent with the specification? h. Is FDR consistent with specification, with all issues of design and analysis closed? i. Does the FAI validate all items of production; Does analysis and test precede production to minimize changes after production has started j. Are waivers for existing designs evaluated fully to ensure that the waivers are based on proven in-service technology used in demonstrably similar systems? k. Are project technical issues being resolved/mitigated; open items resolved prior to next payment |

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| | 5 | Review the Project Sponsor Quality Assurance Plan and vehicle manufacturer's Quality Program Plan to assure: <ul style="list-style-type: none"> a. Do the vehicle manufacturer and its supplier's QA program and the Project Sponsor's oversight ensure delivery of the vehicle "as designed"? b. Does the Project Sponsor have qualified inspector(s) on site during manufacturing, including during pre-production of jigs and fixtures? c. Do the Project Sponsor and vehicle manufacturer reporting relationships provide sufficient independence to allow issues to be raised? d. Are protocols in place for dealing with discrepant or non-conformant products or materials, to quarantine them before proper disposal; does the Project Sponsor's inspector have a voice in disposal of discrepant or non-conformant products or materials? e. Is the schedule such that choices between corrective action and meeting the schedule do not drive compromise vehicle quality? f. Have the vehicle manufacturer and the Project Sponsor conducted quality audits on a pre-determined schedule? |
| | 6 | Are FAIs complete and do they validate intended design function and performance? |
| | 7 | Is the rail vehicle adequately integrated with other systems such as train control, traction power, communications, wayside facilities, shops and shop equipment? |
| | 8 | Have Buy America Audits been completed and validated? |
| 6.4 | | Acceptance, Commissioning and Readiness for Revenue Service |
| | 1 | Are the qualification and acceptance tests a full validation of the vehicle performance? |
| | 2 | Does vehicle acceptance validate the fleet performance within acceptable tolerances? |
| | 3 | Have Vehicle History Books been completed and do they represent the configuration of the as-built vehicles supplied? |
| | 4 | Have systems integration tests been completed satisfactorily with a validated vehicle configuration? |
| | 5 | Have spare parts, manuals and training been supplied in support of revenue service? |
| | 6 | Are all open items and warranty or fleet defect issues being addressed? |
| | 7 | Are Safety and security certification items (CIL) completed or satisfactorily disposed to allow for safe and secure operation? |
| | 8 | Have reliability, maintainability and other proof of design been addressed or completed? |

Note: These check lists are to be supplemented as needed by the PMOC.