

**U.S. DOT Federal Railroad Administration
Office of Passenger and Freight Programs**

Monitoring Procedure 38 – Vehicle Acquisition and Management

1.0 PURPOSE

This Monitoring Procedure describes the Monitoring and Technical Assistance Contractor's (MTAC) required oversight for Grantees' vehicle acquisition and management.

2.0 KEY PRINCIPLES

For successful rail vehicle procurement, testing, and start-up of operations, Grantees must have sufficient management and technical capacity and capability in development of vehicle design specifications and drawings, project controls, procurement, coordination with stakeholders, vehicle testing, and training of personnel prior to operations.

3.0 REQUIRED DOCUMENTS

The MTAC will obtain from the Grantees the following documents:

1. Management and project controls documents
 - a. Project description
 - b. Grant application and amendments
 - c. Project management plan (for corridor project; for vehicle procurement)
 - d. Project organizational chart
 - e. Statement of equipment needs
 - f. Service development plan (if applicable)
 - g. Project schedule (for corridor project; for vehicle procurement)
 - h. Cost estimate / budget / financial plan with funding sources, including allocation of funding for joint procurements
 - i. Non-disclosure / confidentiality agreement with vendor/manufacturer, if reqd
 - j. Procurement solicitations, technical responses and evaluations
 - k. All monthly meeting project minutes
 - l. Contracts for design-build with key contract clauses such as penalty clauses for late delivery, failure of the owner to take actions within a certain period, change order requirements, options for more similar vehicles
 - m. Contract Deliverables Master List- Complete contract, all listed in T&C of vendor contract
2. Technical documents
 - a. Environmental clearance document
 - b. Engineering Plan
 - i. Vehicle specifications including citation of appropriate regulations, environmental and performance standards, and the required approval or certification by authority (Federal,

- State, etc.); e.g. RSAC requirements for passenger rail; and applicable regulatory approvals based on location/type of signal system
- ii. Design, Analysis, Manufacture, and Testing
 - Vehicle drawings
 - Plan for PDR, IDR, FDR
 - Plan for modeling of car body crashworthiness
 - Plan for metal fab and mechanical equipment installation
 - List of assemblies, and subassemblies to FAI
 - List of drawings and supporting information for analysis and testing (including proof of design), availability, maintainability, operability, safety, serviceability, reliability, configuration control, and management
 - c. Inspection and Testing Program Plan
 - i. Safety and security certification plans and the Certifiable Items List
 - ii. FRA Safety regulatory assessments with concurrence or approvals
 - iii. Buy America audits
 - iv. First Article Inspections (including major components)
 - v. Tests
 - d. Final delivery of vehicles
 - i. Warranties
 - e. QA QC Plan for design/mfr of vehicles (and supporting documents)
 - f. Vehicle history books
 - g. Training programs (operator, engineering, maintenance, etc.)

4.0 SCOPE OF WORK

4.1 MTAC Management Support

On a program-wide basis, an MTAC will be asked to establish, maintain, and implement a vehicle information matrix to track projects and activities against schedule. The matrix will help to track FRA-funded equipment projects, by equipment type and quantity, with the documents listed in 3.0 above, and with the elements and activities listed in Appendix A below, for these purposes:

- To ensure coordination of activities by FRA Office of Safety and FRA Office of Railroad Policy and Development; notification of FRA staff of upcoming events, issues, and requirements for FRA action; ensure concerns of grantees and other parties are brought in a timely way to the appropriate FRA staff; ensure coordination with capital project deadlines, grant reimbursement processes and funding milestones, and adequate lead time for approvals
- To monitor procurement schedules, discuss with FRA Regional/Project Managers for the projects, and generate recommendations for reducing manufacturing and testing durations
- To meet during design with railroad suppliers and attend design meetings

This management support ties directly to technical oversight of Grantees, described below.

4.2 MTAC Technical Support

The MTAC's review helps to ensure the Grantee competently manages the vehicle specifications, procurement process, manufacturing approach, quality and testing process, commissioning, and safety

assessment process, ownership, management and maintenance. It should also help to ensure the resulting vehicles meet program requirements, and conform to applicable statutory requirements, regulations, guidance, and cost and schedule limitations.

MTACs should develop an approach to the reviews that is appropriate to the Grantees' work and that yields accurate findings and valuable recommendations.

Multiple procurements are already in process. They are serving projects in multiple regions. Some of these procurements are "joint," meaning they serve two or more grantees from different parts of the country. Joint procurement should yield benefits such as:

- increased interoperability
- increased consistency in meeting standards
- reduced cost per vehicle for design, manufacture, project management
- increased efficiency in ownership, maintenance and operation of the fleet.

Through a Vehicle Task Order, an MTAC will oversee all vehicle procurements, and will ensure coordination between Grantees leading procurements and Grantees participating. Example: California and the Midwest Region Grantees are jointly procuring cars and locomotives. One is lead while the other Grantee is participating in the car procurement.

1. MTAC oversight of all Grantees engaged in procurements (leading and participating)
 - a. The respective MTACs shall attend their own monthly and quarterly meetings and when necessary, attend the meetings of other Grantees participating in procurements.
 - b. MTACs shall ensure Grantees actively coordinate with their joint procurement partners, and adequately prepare for delivery of vehicles, testing, and training of personnel prior to operations.
 - c. The MTAC shall ensure that Grantees develop a Vehicle Acquisition and Management Plan that references items in 3.0 above and Appendix A below, and the following:
 - Equipment ownership, management, and maintenance
 - ownership structure; management responsibilities; assignment rights; equipment maintenance; financial terms to ensure adequate operating funding for vehicle O & M, and overhaul over the service life according to industry best practices
 - For multi-state equipment pools
 - state the terms of deployment/redeployment between corridors
 - describe the equitable allocation of pooled equipment
 - production order and delivery schedule between Grantees
 - The Plan shall also be consistent with the Project Fleet Management Plan
2. MTAC oversight of Grantees who are leading procurements
 - a. The MTAC should ensure that Grantees have sufficient:

- i. Management and technical capacity and capability in rail vehicles
- ii. Expertise in project controls, especially management of the schedule, and ability to sequence activities to reduce overall duration.
- iii. Technical competence (reference items below and in Appendix A below)
 - Compliance with specifications approved by Passenger Rail Investment and Improvement Act of 2008, 305 Next-Generation Equipment Committee
 - Compatibility with Amtrak rolling stock (locomotives and cars) and fixed plant (station and maintenance shop)
 - Modeling of car body crashworthiness; consistency of test data against model
 - Vehicle Track Interaction (VTI) criteria
 - Design of traction power and signaling
 - Testing
 - ADA and Buy America (Pre-Award and Post-Award Audits)
 - Management of change orders
 - Agreements for pooled equipment are finalized
 - Ownership, management and maintenance
- iv. Ability to conduct planning and reviews and productively incorporate results of reviews into the project
 - QA QC plan so that materials are as specified, testing procedures and manufacturing processes are correct
 - System Safety Program Plan (per CFR 238)
 - Risk and Contingency (cost and schedule) Management Plan
 - Hazard Analysis, Threat and Vulnerability Assessment

5.0 REFERENCES - SEE MP 01

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Rail Vehicle Technical Review Checklist

Rail Vehicle Technical Review Checklist

The MTAC should perform the reviews below and follow the checklist below; supplement it as needed. The MTAC should report discrepancies, make suggestions for correction as appropriate, follow up and report on the corrective actions taken by the Grantee.

The MTAC should consider the issues for each stage of the procurement process.

1. Cost - issues impacting cost as related to the use of technology, deviation from industry accepted designs, contract packaging, and specification enforcement
2. Schedule, issues potentially and actually impacting schedule
3. Vehicle quality and safety issues
4. Vehicle reliability, availability and maintainability
5. Issues impacting vehicle operability
6. Faulty or unreliable vehicle designs or systems
7. Known component or material deficiencies and availability of replacement parts
8. Ownership
9. Fleet management
10. Fleet maintenance
11. 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

1. Planning, Solicitation, Vendor Selection

1. The MTAC will review the materials listed in Section 3.0 of this MP to ensure the acquisition/procurement documents meet the Grantee's stated purpose.
2. The MTAC will review the vendor selection process, including 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, and any other related documentation to ensure it fulfills the Grantee's stated purpose.
3. The MTAC will evaluate the documentation and vendor selection process and will also:
 - 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-on terms
 - d. Ensure that the contract vehicle options meet the Grantee'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

2. Design and Manufacturing

1. The Grantee will conduct a Preliminary Design Review (PDR), and Intermediate Design Review (IDR), and Final Design Review (FDR). The MTAC will participate and document these reviews in each instance.
 - a. These reviews are essential to verify the equipment is designed according to the approved specifications; and proper interface coordination occurs in a timely manner

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- (according to the agreed schedule) between vehicle design and train control, traction power, communication, track, wayside and related systems design.
- g. During the IDR and FDR, Equipment Testing may be required to verify the equipment design qualification requirements are met.
2. The MTAC will ensure the Grantee's schedule includes all FRA Safety reviews, testing, qualification, or expected waiver requests (if required). This includes a minimum of 30 days advanced notice prior to the commencement of any testing that is required to demonstrate compliance with regulatory requirements. The Grantee is required to build FRA Safety requirements into its schedule.
 3. As part of the Design and Manufacturing, the MTAC will review the Grantee's management of and processes for review and approval of the following:
 - h. Vehicle manufacturer's design/ structural design
 - i. Production schedule
 - j. Materials
 - k. Subsystems
 - l. Sub-contractors
 - m. QA/QC plans and inspection forms
 - n. Hold points for Grantee inspections/approvals
 - o. First Article Inspection (FAI) procedures and schedule
 - p. Vehicle History Book Development
 - q. CDRL submissions and approvals
 - r. Verification of adherence to safety, security, Buy America Audit, and ADA requirements
 4. The MTAC will also review and provide oversight of the Grantee's management of and processes for reviewing and approving the vehicle manufacturer's:
 - a. Qualification and production conformance test plans (including static and dynamic testing) and execution of those plans
 - b. Handling of non-compliant test results
 - c. Retesting
 - d. Acceptance of the vehicle structure, interior, propulsion and braking systems, doors, and all other vehicle systems

3. Pre-Revenue Testing (on the intended route)

Pre-Revenue Testing is required to verify the requirements of the specifications and compliance with FRA Safety Regulations are met. The MTAC will ensure requirements and compliance are met in the Pre-Revenue Testing Environment on the intended route. The MTAC shall review the following:

1. Identification of material, subcomponent, component, or system tests required to meet specifications or regulatory requirements
2. Expected equipment movement approvals from the FRA Office of Safety for delivery or shipment to testing locations
3. Hold points for Grantee inspections/approvals
5. First Article Inspection (FAI) procedures and schedule

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6. Vehicle History Book Development
7. CDRL submissions and approvals
1. Sample car inspection requests for safety appliances and emergency signage
2. Vehicle qualification (if required) for high-speed or high cant deficiency operations (per 49 CFR Part 213)
3. Pre-revenue test plans per 49 CFR Part 238.111
4. Grantee's hardware and software safety program, including any Failure Modes, Effects, Criticality Analysis (FMECA) pursuant to 49 CFR Part 238.105
5. Submission of Locomotive Electronics Safety Analysis (SA) for FRA review pursuant to 49 CFR Part 229, Subpart E (if applicable)
6. Vehicle manufacturer's
 - a. qualification and production conformance test plans (including static and dynamic testing) and execution of those plans
 - a. testing and handling of non-compliant test results
 - b. acceptance of the vehicle structure, interior, propulsion and braking systems, doors, and all other vehicle systems

4. Acceptance, Commissioning, and Readiness for Revenue Service

At this final stage of the procurement process, the MTAC should review acceptance and commissioning activities and provide oversight of the Grantee's planned management of and processes for:

1. Receipt of vehicles
8. Static and dynamic (on site) qualification/acceptance testing plans and procedures
9. Identification process for needed modifications and modification management process
10. Systems integration and interface compatibility testing (integrated testing) with civil infrastructure and wayside systems
11. Commissioning and start-up operations testing (including pre-revenue)
12. Acceptance and stocking of spare parts
13. Vehicle manufacturer and vendor manuals and training delivery
14. Conditional and final acceptance requirements
15. Warranty management
16. Delivery of vehicle history books
17. Satisfactory completion of the railroad's Pre-revenue Testing Plan under 49 CFR Part 238.111
18. FRA concurrence of vehicle qualification for high-speed or high cant deficiency operations (if required)

5. Meeting Notes, Trip Reports, and Reports on Reviews

The MTAC shall document every event, meeting, review, etc., with meeting note, trip report, or review report, as appropriate. (Refer to MP 01 for information on reports.)

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Section	Issue	Description
1		Planning and Solicitation
	1	Confirm that the intended vehicle does not potentially conflict with statements in the environmental documents and describe any conflicts between environmental documents and the intended vehicle and Grantee’s intended response
	2	Consider how well the proposed vehicle fulfills the Grantee’s stated purpose of the project, complies with applicable statutes and regulations, and fits the operational requirements
	3	Will the specified vehicle fit the Grantee 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: <ul 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 Grantee’s disposal? d. Will the specified training program enable the Grantee to perform vehicle operations and maintenance? e. Are adequate measures taken to protect the Grantee in terms of liquidated damages, weight penalties, design conformance, warranty provisions, delivery of “as-built” drawings?
	6	Review Contract Terms and Conditions: <ul style="list-style-type: none"> a. Are appropriate FRA 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. Are 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 Grantee holds sufficient reserve 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: <ul style="list-style-type: none"> a. Was an RFEI distributed? Adequate competition for selected technology/vehicle? b. Was the pre-proposal conference held and were questions answered fully? Was the Contractor questionnaire used?
2		Vendor Selection
	1	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	Monitor negotiation process and agreed terms
	4	Ensure any contract options meet Grantee’s needs
	5	Verify Pre-Award Buy America Audit
	6	Monitor NTP post-award conferences
3		Design, Manufacturing and Testing

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1	<p>Contract Deliverables Requirements List: Does the CDRL ensure that all critical performance issues are adequately analyzed, 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 and compliance with industry practice and safety regulations 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 m. Hardware and Software safety program n. Locomotive Electronics Safety Analysis (if applicable) <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 tests, by acceptable analysis, or prior agency certified tests? 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 ensure satisfactory interfacing with the existing infrastructure? d. Do the qualification and acceptance test criteria ensure the vehicles “as delivered” will meet the Grantee’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	<p>Does the test plan and CDRL ensure the vehicle will perform on the actual infrastructure?</p>
4	<p>Review Design Documents:</p> <ul style="list-style-type: none"> a. Do the documents address the intended issues? b. Is there a properly sequenced and efficient design plan to ensure technical compliance that mitigates rework? c. Are assumptions valid and proven? d. Do analytical methods meet current professional standards? e. Is the Grantee’s review conducted by persons competent in the field and

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		<p>capable of detecting and commenting on design and analytical errors?</p> <p>f. Are drawing and configuration control designed to ensure consistency throughout the fleet, including option orders?</p> <p>g. Is PDR consistent with the specification?</p> <p>h. Is FDR consistent with spec, with all issues of design and analysis closed?</p> <p>i. Does the FAI validate all items of production and does analysis and test precede production to minimize changes after production has started?</p> <p>j. Are waivers for existing designs evaluated fully to ensure they are based on proven in-service technology used in demonstrably similar systems?</p> <p>k. Are project technical issues being resolved/mitigated and open items resolved prior to the next payment?</p>
	5	<p>Review the Grantee Quality Assurance Plan and vehicle manufacturer’s Quality Program Plan:</p> <p>a. Do the vehicle manufacturer and its supplier’s QA program and the Grantee’s oversight ensure delivery of the vehicle “as designed”?</p> <p>b. Does the Grantee have qualified inspector(s) on site during manufacturing, including during pre-production of jigs and fixtures?</p> <p>c. Do the Grantee and vehicle manufacturer reporting relationships provide sufficient independence to allow issues to be raised?</p> <p>d. Are protocols in place for dealing with discrepant or non-conformant products or materials and to quarantine them before proper disposal? Does the Grantee’s inspector have a voice in the disposal of discrepant or non-conformant products or materials?</p> <p>e. Is the schedule such that choices between corrective action and meeting the schedule do not compromise vehicle quality?</p> <p>f. Have the vehicle manufacturer and the Grantee conducted quality audits on a pre-determined schedule?</p>
	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?
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 to support revenue service?
	6	Are all open items and warranty or fleet deficiencies being addressed?
	7	Are safety and security Certification Items List (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