Next Generation Corridor Equipment Pool Committee

(NGEC)

PRIIA Section 305 Bi-Level Vehicle

Technical Specification 305-001

Executive Board Review Panel

Technical Specification Revision C.2

Author: Larry E. Salci, Principal, *SalciConsult*

Report Date: September 29, 2014

Review Panel Meeting Date: October 16, 2014

Executive Board Approval: October 24, 2014

CONTENTS

Section		Page
1	INTRODUCTION	3
2	BACKGROUND	7
3	DOCUMENT CONTROL COMMITTEE DEFINITIONS OF URGENT, MAJOR, AND MINOR RECOMMENDED CHANGES	9
4	RECOMMENDATIONS FOR APPROVAL OF MAJOR CHANGES TO BI-LEVEL VEHICLE TECHNICAL SPECIFICATION-REVISION C.2	10
5	Table 1 – Review Panel Urgent and Major DCRs Recommended For Approval	13

1. INTRODUCTION

The Purpose of this Review Panel Report for the NGEC Bi-level Vehicle Technical Specification, Revision C.2, is to review and recommend approval to the NGEC Executive Board. These document change requests (DCRs) submitted by Caltrans to the NGEC's Document Revision Coordinator, are the result of Caltran's administration of the bi-level technical specification used for the procurement and subsequent purchase contract for the design and manufacture of the bi-level vehicles by Sumitomo Corporation of America (SCOA) and Nippon Sharyo USA. This Review Panel Report contains Caltrans submitted DCRs number 001-0222, 001-0223, 001-0224, and 001-0225 which in total contain 135 individual document change requests. The details of each of these DCRs are provided later in this report in Sections 4 and 5.

NGEC Document Management Process, PRIIA Procedure 305-100, Section 1.5.12, DCR Review Process During Periods When Full Technical Subcommittee Participation is Precluded

Specification revisions which are identified during periods in which participation by the full Technical Subcommittee membership is precluded ("closed" periods, such as during an active procurement, bid evaluation or negotiation) must be initiated in the form of a DCR jointly by the Agencies and States involved in the activity, and submitted to the NGEC Review Panel. The Review Panel remains responsible for reviewing NGEC specification revisions to ensure that the revised specifications remain compliant with their respective Requirements Documents.

Once contract award occurs, changes to the specification which occurred during the closed periods will be presented to the Revisions Control Coordinator and Document Control Coordinator who will make a decision (based on the nature of the revisions) as to whether or not these revisions should be incorporated into a "base" specification that would be used for additional procurements, or should remain unique to the as-built specification for the particular procurement. If it is determined that changes to the base specification are warranted, these changes will be submitted as DCRs and be handled using the existing Document Management "Urgent" Process. It is expected that revisions which have been accepted by the Review Panel during the closed period will also be made to the base specification in parallel.

During these closed periods, the existing NGEC specification Review Panel will be used with support from the NGEC, FRA, Amtrak, and consultants who have signed nondisclosure/confidentiality agreements to ensure procurement integrity.

Historical Summary of NGEC Bi-level vehicle Technical Specification and Subsequent Specification Revisions Approved by the NGEC Board and its Review Panel

The PRIIA Section 305 Next Generation Equipment Committee's Executive Board created a Technical Subcommittee to develop and prepare a Technical Specification for the procurement of bi-level stainless

steel passenger rail vehicles. The Bi-level vehicle technical specification 305-001 was approved by the Technical Subcommittee at its July 29, 2010 and subsequently by the Executive Board at its August 31, 2010 meeting.

This Bi-level vehicle Technical Specification was used for the procurement of a fleet of new bi-level vehicles for use in medium to long-distance intercity corridor service in North America, with the initial procurement of 130 bi-level vehicles for California, Illinois, Michigan, and Missouri. A competitively bid contract was awarded to Sumitomo Corporation of America (SCOA) and Nippon Sharyo USA with a Notice to Proceed of November 27, 2012. The cars are being manufactured in the Nippon Sharyo plants in Rochelle, Illinois under PRIIA Buy America requirements and the first cars are planned for delivery and final acceptance beginning June 2016. The contract is administered for the NGEC by Caltrans with the support of Illinois DOT and the Midwest states.

The bi-level vehicle procurement is funded by multiple grants awarded to the States by the Federal Railroad Administration, utilizing federal funds from U.S. DOT FY-10 appropriations and from the American Reinvestment and Recovery Act funds allocated to the Intercity High Speed Rail Program. In addition, the State of California provided funding for a portion of the bi-level cars and locomotives for Caltrans.

The NGEC Executive Board previously approved Bi-level vehicle technical specification 305-001 and subsequently Revisions A, B, C and C.1. The specification document changes were approved under the NGEC Board's Document Management Process, PRIIA Procedure 305-100, Revision B, 1-8-13. The Document Management System is intended to be a method by which the vehicle specifications, processes, designs, and support documents as approved by the PRIIA 305 NGEC are managed, reviewed, revised, controlled, and stored in a manner that preserves the integrity, intention and detail of approved documents while simultaneously allowing those documents to be edited, revised and corrected as needed to reflect changes in technology, resolve inconsistencies, improve document language for clarity and to correct errors.

In order to determine whether the Bi-level Vehicle Technical Specification, and any subsequent DCRs, meet the requirements of the NGEC Executive Board Requirements Document, the Executive Board decided to create a Review Panel to determine whether the specification, as approved and revised, met the "Requirements" for design and performance objectives derived from the Passenger Rail Investment and Improvement Act, 2008 (PRIIA) Section 305 mandate, and whether the decision process undertaken by the Technical Subcommittee met the inclusive process requirements of PRIIA. The Bi-level Vehicle Technical Specification and Revisions A, B, C, and C.1 were reviewed and approved by previous NGEC Executive Board Review Panels. The preparation of this Report for Revision C.2 follows the same NGEC Executive Board policies and procedures noted above and are presented for the Bi-level vehicle Review Panel's consideration and approval.

Summary of cumulative Bi-Level Technical Specification Revisions A, B, C, and C.1 Document Change Requests (DCRs) Previously Approved by the Review Panel and Executive Board and Rev. C.2 Recommended DCRs for Approval

Bi-level Technical Specification DCRs Summary	Urgent DCRs (closed period) Approved	Major DCRs Approved	Major DCRs Rejected	Minor DCRs Approved	Total DCRs Approved
Revision A		11	12	29	40
Revision B		23	11	27	50
Revision C		54	19	19	73
Revision C.1 Errata	84			137	221
Total DCRs thru Rev. C.1	**84**	**88**	**42**	**212**	**384**
DCRs Rev. C.2	106			24	130
Total DCRs thru Rev. C.2	**190**	**88**	**42**	**236**	**514**

Revision C.1 (Errata) was approved on September 20, 2012. These DCRs (001-0221) were classified as clarifications, corrections and revisions base on questions and comments received by potential proposers during the RFP period for the bi-level car procurement regarding errors, inconsistencies and obsolete references in the bi-level specification. However, Caltrans submitted a list of multiple recommended specification changes under a single DCR Control Number, 001-0221. These multiple DCRs were classified and treated as Errata, however, for review purposes, 84 were categorized as Major DCRs and reviewed and approved as "Urgent" under the NGEC Document Management Process. The Minor DCRs were deemed approved and consisted of typographical errors, supersession of reference documents, unit of measure changes, etc.

The C.1 Urgent DCR classification was due to the critical September 2012 bi-level procurement schedule and the process dictated these changes needed to be communicated with the potential proposers during the RFP question and answer period. Therefore, the specification was revised accordingly to conform it with the Revision C document and the errata as transmitted to the pool of bidders. This DCR number control process for Revision C.1 did not follow the previous process where each technical DCR was submitted separately and assigned a sequential control number. The single control tracking number for the multiple (84) Revision C.1 DCRs was 001-0221.

Similarly, Caltrans has submitted additional specification change requests under a cumulative list under tracking Numbers 001-0222 and 001-0225. The list of changes contained in DCR 001-0222 includes 106

total DCRs and 001-0225 includes 22 DCRs. However, unlike Revision C.1 where the revisions were grouped and reviewed as errata, this report will review and present the entire number of major (Urgent) DCRs by the sequential number listing provided by Caltrans as an attachment to DCRs 001-0222 and 001-0225. All DCRs on the list were reviewed and evaluated as though they were individual DCRs.

Bi-Level Technical Specification Revision C.2 Document Change Requests Review and Approval

The purpose of this Report is for the Review Panel to review and approve/disapprove the Document Control Coordinator (DCC) recommended "Urgent" DCRs to the Bi-level Technical Specification, Revision C.2, summarized in this Report.

Review Panel Members:

Eric Curtit, Chairman	Missouri Department of Transportation
Arun Rao	Wisconsin Department of Transportation
Tammy Nicholson	Iowa Department of Transportation
John Tunna	Federal Railroad Administration

Review Panel Support:

Larry Salci, Independent Consultant to Review Panel
Dave Warner, Amtrak -Revision Control Coordinator
Tammy Krause, Amtrak, Document Control Coordinator
Steve Hewitt, Administrative Support

Larry Salci was retained by the NGEC, via AASHTO, as an independent transportation passenger railcar consultant to assist the Review Panel in its responsibilities and provide a concise, objective and independent review of the requested revisions to the Bi-Level Technical Specification, Revision C.2. Mr. Salci has over 40 years' experience in the transportation industry, 20 as the CEO of 4 companies responsible for the design and manufacture of over 3,000 passenger railcars and locomotives and also served as the CEO of two major U.S. transit authorities operating commuter rail and light rail transit systems. He has provided independent consulting support to the Review Panel in its review of PRIIA 305 technical specifications, including the bi-level and single level passenger coaches, single level trainset, single level DMU, and a diesel-electric passenger locomotive and all subsequent technical specification revisions. He has also provided written reports on Equipment Standardization and Configuration Management/Document Control.

This review will encompass the Caltrans list of DCRs 001-0222, 0223, 0224, and 0225. Two of these DCRs actually contain multiple DCRs so the actual number of total Urgent DCRs is 106 recommended changes to the technical specification. The Report will summarize each DCR recommendation in this Report (Table 1) for review and consideration for approval by the Review Panel.

2. BACKGROUND

The Bi-level vehicle specification was the first NGEC vehicle technical specification developed and approved by the Executive Board under the PRIIA Section 305 requirements in August 2010. Technical Specification Revision C.2 is being presented under the "URGENT" criteria category due to the procurement stage of the Bi-level technical specification.

The Executive Board's Document Management System Policy 305-100, Rev. B, January 8, 2013 defines "Urgent" DCRs as those which are identified at critical times during the vehicle procurement process. Specifically, 305-100, Section 1.5.12, DCR Review Process during Periods When Full Technical Subcommittee Participation is Preclude, states as follows:

> *Specification revisions which are identified during periods in which full participation by the full Technical Subcommittee membership is precluded ("closed" periods, such as during an active procurement, bid evaluation or negotiation) must be initiated in the form of a DCR jointly by the Agencies and States involved in the activity, and submitted to the NGEC Review Panel. The Review Panel remains responsible for reviewing NGEC Specifications revisions to ensure that revised specifications remain compliant with their respective Requirements Documents. For specification changes during this period of time, the Review Panel can be comprised of representatives of Amtrak, NGEC-participating States and the FRA. Consultants under contract to the NGEC, Amtrak or FRA who have signed nondisclosure/confidentiality agreements may serve on the Review Panel should their technical expertise be required.*
>
> *Proposed revisions which are accepted will be incorporated into the version of the specification against which the contract is awarded, and serve to create the as-built specification for the procurement.*
>
> *Once contract award occurs, changes to the specification which occurred during the proposal/procurement phase will be presented to the Revision Control and Document Control Coordinators who will make a decision (based on the nature of the revisions) as to whether or not these revisions should be incorporated into a "base' specification that would be used for additional procurements, or should remain unique to the as-built specification for the particular procurement. If it is determined that changes to the base specification are warranted, these changes will be submitted as DCRs and be handled using the existing Document Management "Urgent" Process. IT is expected that revisions which have been accepted by the Review Panel during the closed period will also be made to the base specification in parallel. The need for a base specification in tandem with the evolving as-built specification associated with the active procurement is necessary in order to provide for the possibility of another agency seeking to use the same equipment specification at the same time*
>
> *In summary, the Document Management Process as presently conceived (Urgent, Major, Minor) is sufficiently robust to accommodate document and specification changes throughout the*

lifetimes of these documents with the exception of those changes deemed necessary which are identified during closed periods. During this time, the existing NGEC specification Review Panel will be used (with support from NGEC, FRA or Amtrak consultants who have signed nondisclosure/confidentiality agreements in place to ensure procurement integrity) as a means for both adjudicating the proposed revisions to the specification as well as ensuring that such revisions remain consistent with the governing requirements documents.

PRIIA Bi-Level Specification (305-001) (AMTK -962), Revision C.2 Table 1 is the complete listing of the most recent "Urgent" Bi-level vehicle changes submitted for consideration by Caltrans (procurement contract manager) to the Revision Control Coordinator (Dave Warner, Amtrak). DCR 001-222 is the single DCR control tracking number assigned to the collective 109 submitted DCRs.

The DCRs were reviewed by the Document Change Coordinator (Tammy Krause, Amtrak) and is submitted to the Bi-level Technical Specification Review Panel for its consideration. The Caltrans DCR listing was reviewed by the Revision Control Coordinator (RCC) who is responsible for administering DCRs: reviewing for completeness, assigning a tracking number, collating and compiling completed DCRs and making the appropriate changes to the affected documents, and managing the document revision process. The Document Control Coordinator performed the appropriate reviews under the "Urgent"

The resources of the DCC shall mirror that of the Technical Subcommittee that developed, reviewed and approved the specifications, however, under the Urgent process, technical resources are limited to Amtrak and the FRA and the private sector companies and consultants are excluded. The DCC resources mirror the same technical subgroups of the Document Control Board:

- Mechanical
- Electrical
- Interiors
- Vehicle/Track interaction
- Structural
- Locomotives
- Individual(s) with operations, maintenance, and vehicle interoperability expertise
- Individual(s) with equipment procurement experience

Changes may be requested by any member of the NGEC, the Technical Subcommittee, or others by submitting a Document Change Request (DCR) that is found on the AASHTO web site. <u>All changes must be requested by using the DCR.</u>

3. Document Control Committee Definition of Urgent, Major and Minor Recommended Changes

The Document Management System Policy, currently utilized by the DCC, determines whether a DCR meets the criteria for Urgent, Major, or Minor revisions.

Urgent revisions are those which are identified at critical times during the vehicle acquisition process that may affect the following:

- Safety of operations
- Expeditious engineer approval
- Material orders
- Production
- Design Review
- Other time-sensitive matters

Major revisions are those revisions that make substantive changes to a specification or process, that may affect the following:

- The final design of a vehicle or components;
- The performance requirements for the vehicle, or the way that vehicle is operated or maintained;
- The way NGEC approved procurement processes are administered; or
- The interoperability of vehicles with other rail equipment

Minor revisions are administrative in natures that will not substantially affect the process or specification. Examples of minor revisions include:

- Corrections or typographical errors;
- Updates to reference documents to reflect changes to revision levels or supersession of existing reference documents with new;
- Formatting or organizational changes that do not change content; and
- Addition or clarification of abbreviations, units of measure.

The DCC has the authority to approve Minor DCRs. In the event that it is unclear as to whether a DCR falls into the Major or Minor category, the DCR shall be considered Major.

4. Recommendations for Approval of Urgent and Major Changes to the Bi-Level Technical Specification- Revision C.2

Listed below in Table 1 is a summary description of the Urgent and Major DCRs recommended for review and approval by the Review Panel to forward to the NGEC Executive Board for approval. **The** Table 1 matrix summarizes the Technical Specification DCRs 001-0222, 001-0223, 001-0224, and 001-0225. The Table 1 matrix column headings starting from the left are the DCR tracking number (and multiple listing number), Technical Specification Chapter and Section Reference, Technical Specification Language to be Changed, Technical Specification Suggested Replacement Language, and Rationale for the Requested Technical Specification Change.

A color coded summary of each of the 4 DCRs column heading section description is used to assist the Review Panel in its review of all DCRs since DCRs 0222 and 0225 are for multiple DCRs and have a number listing for each of the multiple DCRs listed under the master DCR tracking control number:

- DCR 001-0222 (Multiple DCRs-106)
- DCR 001-0223 (seat workstation table)
- DCR 001-0224 (Trainline Comm Pins 24 & 25 for Emergency Two-Way Communication)
- DCR 001-0225 (multiple-22)

It should be noted that the NGEC's Document Management Process stipulates that only one technical change per DCR is to be submitted. However, as noted above DCRs 0222 and 0225 both have multiple DCRs listed under one DCR tracking number. These state submittals in the future should follow the Document Management Process Policy 305-100, i.e., one technical change per DCR. It should also be noted that the number sequence in DCR 0222 for requested TS changes omits certain numbers, e.g., there is no number 6. Those numbers omitted from the Table 1 sequential list were listed as "Minor" DCRs in the master DCR submittal list from Caltrans and are deemed approved at the DCC level. Therefore, they were not listed for Urgent DCR approval by the Review Panel in Table 1.

To further assist the Review Panel's review of this Report, the DCR tracking number listing follows the sequential Technical Specification Chapter number listing that is standardized for all NGEC Technical Specifications, e.g., Chapter 1 Executive Summary, Chapter 4 Carbody, Chapter 9 Interior, Chapter 18 Materials and Workmanship, and Chapter 19 Test Requirements. Therefore, as changes are recommended in a chapter that impacts a component or system specification or material change, it will likely also impact the chapters on Materials and Workmanship and Test Requirements for those same specified systems and materials. The NGEC Board's Document Management Process is functioning as intended to provide the integrity and document control of all changes to previously approved and /or revised technical specifications.

DCR 001-0222 Requests to Change AW3 (crush passenger load weight requirements) to AW2 (car at normal full load weight) for Carbody Vehicle Design, Trucks Stress Analysis, HVAC passenger comfort, and Test Requirements

Caltrans DCR 001-0222 requests a change from AW3 to AW2 weight values for design criteria creating multiple DCRs impacting the Bi-level Technical Specification 305-001 Chapter 4, Carbody, Chapter 5 Trucks, Chapter 10 HVAC and Chapter 19 Test Requirements.

The rationale for specifying the AW3 Crush Passenger Load for carbody design, truck stress analysis, HVAC capacity and test requirements is deemed to be too onerous for the operating environment contemplated for intercity and state corridor passenger services; different from the urban rapid transit rail operating environment. The AW3 crush load is common and appropriate for the light rail and heavy rail urban rail vehicle operating environments that routinely experience a crush load operating environment. A more detailed explanation of the requested change is provided below.

First, it is important to understand the **Assigned Weight (AW)** defined values contained in the Bi-level technical specification as compared to the values derived from research performed by Caltrans subject matter experts during the design phase that are the basis for the DCRs. Listed below are the definitions contained in the existing bi-level technical specification used for the procurement, Chapter 2, Glossary & Abbreviations definitions for weight values:

- AW0 – Empty vehicle operating weight, ready-to-run (assigned weight “0” load)
- AW1 – Car at seated load and no standees
- AW2 – Car at normal full load
- AW3 – Car at crush load

The Review Panel, in its detailed discussion of the multiple DCRs requesting change from AW3 to AW2, requested additional information to be provided that detailed the rationale for the requested change based on the technical design review analysis associated with the various AW values that were recommended to be changed and used to control design of the vehicles.

The following recommended AW values define the weight of the vehicles under a number of specified passenger occupancy conditions; ready to run, seated load and two definitions of standee loads. These definitions of AW were derived from AW values defined by the American Public Transportation Association (APTA) as follows:

- AW0 – Ready to run, full supplies, no passenger
- AW1 – AWO plus one passenger per revenue seat and one crewmember
- AW2 – AW1 plus one standing passenger for every 3 square feet of open floor space
- AW3 – AW1 plus one standing passenger for every 1.5 square feet of open floor space

An average passenger is defined by APTA as weighing 155 lbs. This weight was increased in the NGEC specification to 180 lbs. per passenger on average, due to the fact that most rail passengers travel with luggage, computers or backpacks, and that current anthropomorphic data indicate that the 155 lb. average may be obsolete due to an aging and heavier population. AW3 is crush load similar to that frequently encountered in the Tokyo subway; e.g., a person standing on an 11 x 17 inch area which is close to equaling 1.5 square feet. This kind of crush load may be common in urban rapid transit systems such as New York or Tokyo, it is extremely unlikely that any intercity or commuter rail equipment will experience this kind of extraordinary loading. AW2 conditions are occasionally experienced under sever service circumstances, and while they are an undesirable level of comfort for intercity/commuter rail passengers and are generally avoided if possible, they must be used for design capacity criteria.

The AW values are used to control the design of the railcar in a number of significant ways:

- Carshell maximum load calculations for structure, floor beam deflection, carbody camber, deflection of secondary suspension due to carbody loading, and clearances and stress analysis
- Truck frame design for load, fatigue, bearing capacity, and axle design.
- Brake system for heat loading of brake components, holding a train on a grade with the handbrake and wheel-slide control systems
- HVAC system design, including heat generation due to passenger load
- Test requirements for verification of proof-of-design and material requirements

The approval of specification 305-001 included the maximum loading condition for design worst-case scenario defined as AW3 (car at crush load). This was a carryover from the use of the term AW3 to define crush load for Amtrak's Surfliner railcars (built by Alstom for Amtrak and Caltrans) as a second generation of the California Car design (built by Morrison Knudsen), though, in the specification for the Surfliner cars, the term AW3 was only defined as crush load and no correlation was drawn between the terminology and a quantification of the passenger load associated with that term. Research performed by the Caltrans subject matter experts determined that a number of Surfliner designs (including truck frame stress fatigue testing) were based on the California Car design. The combined California Car/Surfliner technical specification design was used as the baseline design for the NGEC Bi-level car.

The California Car specification defines "crush load" as seated load plus one standing passenger for every 4 square feet of open floor space. This definition creates a crush load weight that is slightly lighter than that created by the American Public Transportation Association (APTA) definition of AW2 (seated load plus one standing passenger for every 3 square feet). Thus, the design criteria for the NGEC Bi-level cars as defined by APTA's AW2 provides a car design that is more robust than the California Car design.

<u>In summary, the rationale for revising the design weight requirement in the NGEC bi-level specification from AW3 to AW2 is based on the sound reasoning given above for use of the APTA definition of AW2.</u>

Table 1

Bi-level Passenger Rail Car Technical Specification –Revision C.2

Review Panel Urgent and Major Document Change Requests Summary

DCRs: 001-222, 001-0223, 001-0224, and 001-0225 Recommended for Approval

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
1	Ch. 1 Specification Summary 1.4.1 pg. 32	All seating areas include carpeting, curtains and convenience outlets	Revenue seating areas include curtains and all seating areas include carpeting and convenience outlets	Changed curtains and associated tracks required to be only at every passenger area window that is adjacent to a revenue seat to be consistent with TS 1.4.9, and Ch. 9 Interior 9.2 and 9.6.3
2	Ch.1 Specification Summary 1.4.9 pg. 38	All cars shall be equipped with reclining seats, energy-absorbing workstations tables, carpet, curtains and convenience outlets at every seat, and overhead luggage storage.	All cars shall be equipped with reclining seats, energy-absorbing workstation tables, carpet and convenience outlets at every seat and curtains at every revenue seat, and overhead luggage storage.	Changed curtains and associated tracks requirement to be only at every passenger area window that is adjacent to a revenue seat to be consistent with TS, 1.4.1, Ch. 9 Interior 9.2 and 9.6.3
3	Ch.1 Specification Summary Figure 1-1 Conceptual Interior Layout of Coach Car Pg. 43	Lower Level – 17 seats, 1 ADA Seat, 1 Table	Lower Level – 16 Seats, 1 ADA seat, 1 Table	Improve accessibility options were desired, but would have seating impacts. The TS requirements for seating capacity therefore, needed update.
4	Ch.1 Specification Summary Figure 1.2 Conceptual Cab Baggage Car Layout	Lower Level - 8 Seats, 1 ADA Seat, 2 Tables	Lower Level – 7 Seats, 1 ADA Seat, 2 Tables	Improved accessibility options were desired but would have seating impacts. The TS requirements for seating capacity therefore needed update.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
5	Ch. 2 References and Glossary Sec. 2.3 Definitions, pg. 60	Free Travel – Is defined as the vertical lineal distance between the top of rail and a carbody reference point as measured under static conditions when comparing an empty car (AWO) and a fully loaded car (AW3).	Free Travel – is defined as the vertical lineal distance between the top of rail and a carbody reference point as measured under static conditions when comparing an empty car (AWO) and a fully loaded car (AW2).	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
7	Ch. 4 Carbody, Sec. 4.3, Arrangement, pg. 121	Crush Passenger Load (AW3)	Normal Full Load (AW2)	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
8	Ch. 4 Carbody, Sec. 4.3.1, Dimensions, Weights, and Car Clearances. pg. 122	Except for the pilot, the completed car shall comply with the minimum allowable clearance above top of rail for the carbody and all associated components under the worst combination of conditions, including fully worn wheels, solidly compressed or broken springs, AW3 passenger load, carbody deflection below zero camber and environmental conditions including wind, snow, and ice.	Except for the pilot, the completed car shall comply with the minimum allowable clearance above top of rail for the carbody and all associated components under the worst combination of conditions, including fully worn wheels, solidly compressed or broken springs, AW2 passenger load, carbody deflection below zero camber and environmental conditions including wind, snow, and ice.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
9	Ch. 4, Carbody, Sec. 4.4.2, Camber, pg. 125	The car shall have a positive camber not to exceed 0.5 in. (12.7 mm) under AW1 conditions and must be designed so that under full load, AW3, (and for the life of the car) a negative camber shall never occur. The maximum difference between the cambers of each side sill, measured at the location of maximum deflection, shall not exceed 0.125 in. ((3.175 mm). The Contractor shall evaluate and submit camber values at AWO, AW1 and AW3 load for approval at the design review.	The car shall have a positive camber not to exceed 0.5 in. (12.7 mm) under AW1 conditions and must be designed so that under full load, AW2 (and for the life of the car) a negative camber shall never occur. The maximum difference between the cambers of each side sill, measured at the location of maximum deflection, shall not exceed 0.125 in. (3.175 mm). The Contractor shall evaluate and submit camber values at AW0, AW1 and AW2 load for approval at the design review.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
10	Ch. 4, Carbody, Sec. 4.4.3.1, Fatigue, pg. 125	The carbody strength shall be sufficient to permit operation with up to AW3 loading for the design life of the car (40 years) without structural damage, including fatigue cracks.	The carbody strength shall be sufficient to permit operation with up to AW2 loading for the design life of the car (40 years) without structural damage, including fatigue cracks.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
11	Ch. 4, Carbody, Sec. 4.4.3.1, Fatigue, pg. 126	The completely equipped carbody shall be designed to carry its AWO carbody weight (not including truck weight) plus a uniformly distributed passenger load equal to the passenger portion of AW3. The stresses in the carbody, under an applied AW3 load less the truck weight load shall not exceed the lesser of 50% of the guaranteed minimum material yield strength, or the buckling strength.	The completely equipped carbody shall be designed to carry its AWO carbody weight (not including truck weight) plus a uniformly distributed passenger load equal to the passenger portion of AW2. The stresses in the carbody, under an applied AW2 load less the truck weight load shall not exceed the lesser of 50% of the guaranteed minimum material yield strength, or the buckling strength.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
12	Ch. 4, Carbody, Sec. 4.4.3.1, Fatigue, pg. 126	Notwithstanding the previous paragraph, for each joint design, the static stress at the AW3 carbody load shall be less than the stress that determines the allowable fatigue stress range. The allowable fatigue stress range shall be computed by multiplying the static stress at the AW3 load by the dynamic factor (fatigue load range). This stress range shall be within the design fatigue stress range (fatigue limit) obtained from AAR Standard C-II, Section 7.2, or AWS Standard D1.1, and as approved by the Customer.	Notwithstanding the previous paragraph, for each joint design, the static stress at the AW2 carbody load shall be less than the stress that determines the allowable fatigue stress range. The allowable fatigue stress range shall be computed by multiplying the static stress at the AW2 load by the dynamic factor (fatigue load range). This stress range shall be within the design fatigue stress range (fatigue limit) obtained from AAR Standard C-II, Section 7.2, or AWS Standard D1.1 and as approved by the Customer.	The TS originally required AW3 limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
13	Ch. 4, Carbody, Sec. 4.4.4.9, Subfloor and Floor System, pg. 129	Under a dead load and a maximum passenger loading of AW3, the floor panels shall deflect by no more than 1/250 of the short span between members, up to a maximum of 0.0625 in. (1.5875 mm), without permanent deformation.	Under a dead load and a maximum passenger loading of AW2, the floor panels shall deflect by no more than 1/250 of the short span between members, up to a maximum of 0.0625 in. (1.5875 mm), without permanent deformation.	The TS originally required AW3 limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
14	Ch. 4, Carbody, Sec. 4.4.4.9, Subfloor and Floor System, pg. 129	Under a dead load and a maximum passenger loading of AW3, the floor panels shall deflect by no more than 1/250 of the short span between members, up to a maximum of 0.0625 in. (1.5875 mm), without permanent deformation.	Under a dead load and a maximum passenger loading of AW2, the floor panels shall deflect by no more than 1/250 of the short span between members, up to a maximum of 0.088 in. (2.2352 mm), without permanent deformation.	Changed the value for the floor deflection in TS 4.4.4.9 from 0.065 in. (1.5875 mm) to 0.088 in. (2.235 mm) to be consistent with TS Ch. 18, Materials and Test, Sec. 18.12.7.
15	Ch. 4, Carbody, Sec. 4.4.6, Side Structure, pg. 132	The carbody side and side frame posts shall be capable of supporting AW3 loads with a minimum safety factor of 2.0, based on yield strength, without permanent deformation, at a deflection not to exceed 0.125 in. (3.175 mm).	The carbody side and side frame posts shall be capable of supporting AW2 loads with a minimum safety factor of 2.0, based on yield strength, without permanent deformation, at a deflection not to exceed 0.125 in. (3.175 mm).	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
16	Ch. 4, Carbody, Sec. 4.6, Bolster Anchor Rods and Brackets, pg. 136	The anchor rod bracket or bracket mounting bolts shall be frangible.	The anchor rod, rod bracket or bracket mounting bolts shall be frangible.	Added the truck bolster anchor assemblies as a frangible component, which is a less expensive component and have been used for decades and thousands of frangible bolster anchor assemblies, have been supplied.
17	Ch. 4, Carbody, Sec. 4.13.1, Glazing Materials, pg. 146	Color measurements shall be taken with a spectrometer.	Color measurements shall be taken with a spectrophotometer.	Changed the requirement for the color measurements to be taken with a spectrometer to spectrophotometer because spectrometers are not used to measure color variations.
18	Ch. 4, Carbody, Sec. 4.13.1, Glazing Materials, pg. 146	Deleted language- A permanent veneer shall be applied to the exterior surface of all glazing material. This protective covering shall significantly improve the abrasive resistant qualities of the glazing to abrasive materials, natural atmospheric acids, strong cleaning chemicals and cleaning brushes encountered during normal operating and cleaning conditions.	None.	Provided that the glazing materials meet TS 4.13 (Windows, 49CFR Part 223), and are made of laminated tempered safety glass on the outer pane, then the protective veneer in TS 4.13.1 is not necessary.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
19	Ch. 4, Carbody, Sec. 4.19.3.4, Natural Frequency, pg. 154	The natural frequency of the carbody under AW0 and AW3 load, and supported at the bolsters, shall be calculated. The natural frequency of the carbody under AW3 load, and rigidly supported at the bolsters, shall be no less than 2.5 times the natural frequency of the car's secondary suspension system.	The natural frequency of the carbody under AW0 and AW2 load, and supported at the bolsters, shall be calculated. The natural frequency of the carbody under AW2 load, and rigidly supported at the bolsters, shall be no less than 2.5 times the natural frequency of the car's secondary suspension system.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
20	Ch. 4, Carbody, Sec. 4.19.3.5, Carbody and Truck Fatigue Analysis, Fatigue. Pg. 154	The minimum allowable fatigue stress range for the carbody is computed by multiplying the static stress at the AW3 load by the dynamic factor. The dynamic factor shall be determined by the Contractor but shall not be less than +/-20%. The allowable fatigue stress range shall be based on a calculated car shell lifetime of 10 million cycles. This stress range must be within the fatigue stress range obtained from one of the following sources as approved by the Customer.	The minimum allowable fatigue stress range for the carbody is computed by multiplying the static stress at the AW2 load by the dynamic factor. The dynamic factor shall be determined by the Contractor but shall not be less than +/- 20%. The allowable fatigue stress range shall be based on a calculated car shell lifetime of 10 million cycles. This stress range must be within the fatigue stress range obtained from one of the following sources as approved by the Customer.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
21	Ch. 5, Trucks, Sec. 5.4.4, Stops, pg. 168	Stops that limit truck over-rotation shall be equipped with a replaceable liner to prevent metal-to-metal contact.	Stops that limit truck over-rotation shall be equipped with a replaceable liner to prevent wheel-to-carbody contact.	A TS requirement that wear liners should not be metallic was considered unnecessary for this installation provided they were softer than the wheel material.
22	Ch. 5, Trucks, Sec. 5.4.4, Stops, pg. 168	Rubber stops limiting vertical and lateral motion shall be designed with a progressive compression rate and shall not exceed 90% of their design compression under any condition that can be developed in the truck. Lateral stops shall limit the motion of the car body to 1.5 in. (38.1 mm) in either direction.	Rubber stops limiting vertical and lateral motion shall not exceed 90% of their design compression under any condition that can be developed in the truck. Lateral stops shall limit the motion of the car body to 1.5 in. (38.1 mm) in either direction.	The original requirement for progressive compression rates in the TS was not considered necessary to meet design requirements.
24	Ch. 5, Trucks, Sec. 5.5.4, Journal Bearings, pg. 169	The service life of a journal bearing shall be at least 1,000,000 miles ((1,610,000 km) under AW3 loading.	The service life of a journal bearing shall be at least 1,000,000 miles (1,610,000 km) under AW2 loading.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
25	Ch. 7, Brakes, Sec. 7.5.4, Emergency (Conductor) Brake, Application, and Vent Valves, pg. 184	A Wabtec emergency brake valve p/n 55026 shall be located in the cab of the Assistant's console.	An emergency brake valve shall be installed in the Assistant's console per Chapter 16 (Cab and Train Controls)	The TS identified potentially conflicting requirements for the assistant's console. Clarification was required for what the overriding requirement should be.
26	Ch. 7, Brakes, Sec. 7.5.6, Control Manifold and Valves, pg. 185	Valves shall be acoustically isolated from the car interior areas to minimize exposure of passengers and crew to noise generated by the air brake components. Exhausted air shall be piped to the underside of the car. All valves that have an exhaust port shall be equipped with a wasp excluder.	Valves shall be acoustically isolated from the car interior areas to minimize exposure of passengers and crew to noise generated by the air brake components, except for cab car 30 CDW Brake Valve piloting exhaust. That exhaust line shall be drilled with a minimum size and quantity of holes necessary to confirm to the crew that an application of brakes has occurred. Exhausted air shall be piped to the underside of the car interior. All valves that have an exhaust port shall be equipped with a wasp excluder.	Added an already widespread common practice to provide venting to atmosphere within the cab, and close to the 30-CDW Brake Valve, a limited volume of Brake Valve reduction exhaust to confirm to the crew that a reduction has in fact occurred.
27	Ch. 7, Brakes, Sec. 7.6.1, Disc Brake Actuator, pg. 187	The disc brake actuators shall be Wabtec p/n 694954-0001 (left) and p/n 694954-0002 (right).	The disc brake actuators shall be Wabtec p/n 1-55613 (left and right).	Changed the disc brake actuator specification due to obsolescence of the specified component.
29	Ch. 8, Door Systems, Sec. 8.3.3, Door Panel Construction, pg. 202	Side entrance doors shall be constructed of stainless steel and have a honeycomb core.	Side entrance doors shall be constructed of stainless steel or 304 stainless steel skins and anodized aluminum frame and have a stainless steel or aluminum honeycomb core.	The TS required materials did not allow for aluminum in the frame.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
30	Ch. 8 Door Systems, Sec. 8.4.3, pg. 211	Body end doors shall be constructed of stainless steel and have a honeycomb core.	Body end door shall be constructed of stainless steel or 304 stainless steel skins and anodized aluminum frame and have a stainless steel or aluminum honeycomb core.	The TS did not allow for aluminum in the body end door frame.
31	Ch. 8 Door Systems, Sec. 8.5.1, Door Panel, pg. 214	The door shall be constructed from stainless steel with a stainless steel honeycomb core and shall be equipped with an FRA Type 1 Windshield.	The door shall be constructed from stainless steel or 304 stainless steel skins and anodized aluminum frame with a stainless steel or aluminum honeycomb core and shall be equipped with and FRA Type 1 windshield.	The TS required materials that did not allow for aluminum in the frame.
32	Ch. 9, Interior, Sec. 9.2, General Requirements, pg. 222	Curtains shall be provided on a track located above each window.	Curtains shall be provided on a track located above each window that is adjacent to a revenue seat.	Change curtains and associated tracks requirement to be only at every passenger area window that is adjacent to a revenue seat to be consistent with TS 1.4.1, 1.4.9 and 9.6.3 (Curtains)
35	Ch. 9, Interior, Sec. 9.4.1, Stairways, pg. 227	Each stairway shall be equipped with handrails on both sides with a minimum clear width of 32 in. (813mm) between handrails.	Each stairway shall be equipped with handrails on both sides with a minimum clear width of 27 in. (685.8 mm) between handrails.	For stairways, changed the minimum clear width of 32 in. (813 mm) between handrails to a minimum clear width of 27 in. (685.8mm) between handrails to better accommodate handrails and not adversely affect the width of the upper level.
37	Ch. 9, Interior, Sec. 9.4.10, Overhead Luggage Storage, pg. 231	The bins shall accommodate carry-on luggage of up to 14 in. by 18 in. by 24 in. (356 mm by 457 mm by 610 mm) in size.	The bins shall accommodate carry-on luggage of up to 11 in. by 18 in. by 24 in. (279 mm by 457 mm by 610 mm) in size.	Decreased the size of the carry-on luggage so that the overhead luggage bin does not interfere with the comfort of a seated 95yth percentile male.
38	Ch. 9, Interior, Sec. 9.5.1, Accessible Toilet Room, pg. 234	A polished stainless steel mirror with a minimum 20 in. by 30 in. (508 mm by 762 mm) viewing area shall be mounted above the sink.	A polished stainless steel mirror with a minimum 20 in. (+/- 3 in.) by 30 in. (+/- 3 in.) (508 mm +/- 76.2 mm) by 762 mm (+/- 76.2 mm) viewing area shall be mounted above the sink.	Increased the mirror size in the ATR by +/- 3 in. to match the standard available size for mirrors and for standardization and easily available spares.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
39	Ch. 9, Interior, Sec. 9.5.1, Accessible Toilet Room, pg. 234	Toilet should be constructed of stainless steel, brushed finish.	Toilet should be constructed of stainless steel, brushed finish or Fiberglass Reinforced Plastic (FRP).	Added the option that the toilet shroud can be constructed of Fiberglass Reinforced Plastic (FRP) because the shape of the shroud is complex and would require complex fabrication or tooling to be made of steel.
40	Ch. 9, Interior, Sec. 9.5.2, Unisex Toilet Room, pg. 235	A polished stainless steel mirror with a minimum 20 in. by 30 in. (508 mm by 762 mm) viewing area shall be mounted above the sink.	A polished stainless steel mirror with a minimum 20 in. (+/-3 in.) 508 mm (+/-76.2 mm) by 762 mm (+/-76.2mm) viewing area shall be mounted above the sink.	Increase the mirror size in the UTR by +/- 3 in. to match the standard available size for mirrors and for standardization and easily available spares.
41	Ch. 9, Interior, Sec. 9.5.3, Toilet Room Pan and Flooring, pg. 236	The floor plan of the toilet room modules shall be FRP with a stainless steel overflow pan under the toilet module and shall include waterproof composite flooring which resists accumulation of odors.	The floor plan of the toilet room modules shall be FRP with a fiberglass overflow pan under the toilet module and shall include waterproof composite flooring covering which resists accumulation of odors.	The pan under the toilet module in TS 9.5.3 should be fiberglass, not stainless steel.
42	Ch. 9, Interior, Sec. 9.5.3, Toilet Room Pan and Flooring, pg. 236	The floor pan of the toilet room modules shall be FRP with a stainless steel overflow pan under the toilet module and shall include waterproof composite flooring covering which resists accumulation of odors.	The floor pan of the toilet room modules shall be FRP with an overflow pan under the toilet module. The toilet unit shall not be directly mounted via or through the pan, but be mounted and supported externally so that there are no downward acting forces or any potential for pan penetrations or fractures to occur. The floor pan shall include waterproof composite flooring covering which resists accumulation of odors.	Removed the requirement for the overflow pan to be stainless steel because the shape of the overflow pan is complex and would require complex fabrication or complex tooling to be made in steel.
43	Ch. 9, Interior, Sec. 9.6.3, Curtains, pg.239	A curtain track shall be provided at the top of the window area, along the length of the car for curtain installation.	A curtain track shall be provided at the top of the window area, along the length of the car (except in the café/lounge area or stairwells) for curtain installation.	Changed curtains and associated tracks requirement to be only at every passenger area window that is adjacent to a revenue seat to be consistent with TS 1.4.1, 1.4.9, and 9.2.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
44	Ch. 9, Interior, Figure 9-1, Coach Car Interior Layout, pg. 242	Lower Level – 17 Seats, 1 ADA Seat, 1 Table	Lower Level – 16 Seats, 1 ADA Seat, 1 Table	Improved accessibility options were desired but would have seating impacts. The TS requirements for seating capacity therefore need update.
45	Ch. 9, Interior, Figure 9-2, Cab Baggage Car Interior, pg. 243	Lower Level – 8 Seats, 1 ADA Seat, 2 Tables	Lower Level – 7 Seats, 1 ADA Seat, 2 Tables	Improved accessibility options were desired but would have seating impacts. The TS requirements for seating capacity therefore need update.
46	Ch. 10, HVAC, Sec. 10.2, General Requirements, pg. 249	Passenger load shall be assumed to be AW3 for cooling load calculations.	Passenger load shall be assumed to be AW2 for cooling load calculations.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed.
47	Ch. 10, HVAC, Sec. 10.2 General Requirements, pg. 249	The HVAC system shall be powered primarily from the 480VAC, 3 phase, and 60 Hz supply. The temperature controls shall operate from the 120VAC, 1 phase, 60Hz supply, and the freeze protection circuits shall operate from the 120VAC, 3 phase, and 60 Hz supply.	The HVAC system shall be powered primarily from the 480VAC, 3 phases, 60 Hz. The temperature controls shall operate from the 120VAC, 1-phase, 60Hz or 74VDC supply, and the freeze protection circuits shall operate from the 120VAC, 3-phase, and 60Hz supply.	Added that the temperature controls shall operate from the 74VDC supply, as well as, 120VAC, 1 –phase, 60Hz, as it allows for greater stability of the HVAC system in instances of HEP interruption.
48	Ch. 10, HVAC, Sec. 10.3, Design Parameters, pg. 21	90 Seated passengers and up to 130 standees (load level AW3)	Load level AW2 as defined.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
49	Ch. 10, HVAC, Sec. 10.5, Air Conditioning, pg. 253	Condenser coil assemblies with 0.008 in. (0.203 mm) thick copper fins on 0.38 in. (9.65 mm) diameter copper tubing at a spacing of 8 fins/in. (3 fins/cm).	Condenser coil assemblies with 0.007 in. (0.18 mm) thick copper fins on 0.38 in. (9.65mm) diameter copper tubing at a spacing of 8 fins/in (3 fins/cm).	Space constraints meant cooling capacity might be limited if complying with TS requirements. Modified dimensions would allow more efficient cooling.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
50	Ch. 10. HVAC, Sec. 10.5, Air Conditioning, pg. 254	Thermal expansion valves (2 per unit)	Thermal expansion valves (2 per unit) or capillary tubes.	Changed HVAC requirement to allow either thermal expansion valves or capillary tubes to utilize less complicated components that are less likely to fail.
51	Ch. 10, HVAC, Sec. 10.5, Air Conditioning, pg. 254	Evaporator coil assemblies with two horizontally split sections for modulated and full cooling. The assembly shall have 0.008 in. (0.203 mm) thick copper fins on 0.38 in. (9.65mm) diameter copper tubing at a spacing of 10 fins/in (4 fins/cm).	Evaporator coil assemblies with two horizontally split sections for modulated and full cooling. The assembly shall have 0.007 in. (0.18 mm) thick copper fins on 0.38 in. (9.65 mm) diameter copper tubing at a spacing of 10 fins/in (4 fins/cm).	Space constraints meant cooling capacity might be limited if complying with TS requirements. Modified dimensions would allow more efficient cooling.
53	Ch. 11, Lighting System, Sec. 11.7.4, Exterior Door ADA Lights, pg. 270	A flashing blue LED fixture shall be mounted above or adjacent to each side door opening to serve as a visual beacon to ADA passengers when the adjacent door is open.	A flashing blue LED fixture shall be mounted above or adjacent to the B-end side doors of all car types, and the A-end side doors on coach cars, to serve as a visual beacon to ADA passengers when the adjacent door is open.	Clarification of the location of the blue ADA beacon lights.
54	Ch. 11 Lighting System, Sec. 11.9.2,	LED fixtures shall conform to the requirements of the Energy Policy Act of 2005, and shall utilize white LEDs. The color temperature shall be 3500^{o} - 4100^{o} K.	LED fixtures shall conform to the requirements of the Energy Policy Act of 2005, and shall utilize white LEDs. The color temperature shall be 3500^{o} - 4260^{o} K.	Expanded the range of color temperature for LED fixtures which will have minimal effect on the lighting in the car, will still charge HPPL material and will simplify procurement.
55	Ch. 12, Communications, Sec. 12.3.2.5, Public Address (PA) Amplifier, pg. 287	The PA system (from the input to the microphone to the output of the interior speakers) shall have a 90% intelligibility rating when tested according to ANSI Standard S3.2 -1989 (R1999)….	The PA system (from the input to the microphone to the output of the interior speakers) shall have a 90% intelligibility rating when tested according to ANSI Standard S3.2 -1989 (R1999) or IEC 60268 -16 methods.	Changed the proposed method and justification for intelligibility testing to the IEC rather than ANSI standard because IEC provides advantages over the specified test method to obtain an objective measure of speech intelligibility.
57	Ch. 13, Electrical System, Sec. 13.7.1.4, Indicators, pg.	The Charger shall include individual status indication LEDs that are displayed from the front face. These shall include: Supply 480 VAC ON – Green Current Limit (in – Amber	The Charger shall include individual status indication LEDs that are displayed from the front face. These shall include: Supply 480 VAC On – Green Current Limit (in – Amber	Removed the requirement for the Rectifier Failure LED as the proposed design does not use a traditional rectifier circuit.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
	302	current limit mode) | Load Dump Relayed Energized | Amber Supply 480VAC off/out of tolerance | Red Rectifier Failure | Red Temperature Sensor Failure | Red	current limit mode) | Load Dump Relay Energized | Amber Supply 480VAC off/out of tolerance | Red Temperature Sensor Failure | Red	
61	Ch. 14, Food Service, Sec. 14.8, Food Cart Elevator	A screw driven, fully enclosed elevator shall be provided to convey loaded and empty food service carts and other stock items between the upper and lower levels of the café/lounge car.	A cable driven, fully enclosed elevator shall be provided to convey loaded and empty food service carts and other stock items between the upper and lower levels of the café/lounge car.	Caltrans received positive feedback from Amtrak on the performance and reliability of cable drive elevators operating in the passenger rail environment. Based on Amtrak's experience and the supplemental information provided by Nippon Sharyo to support the advantages of cable drive elevators, the elevator requirement for "screw-driven" was replaced with "cable-driven".
63	Ch. 15, Water and Waste System, Sec. 15.4, Waste System, pg. 370	All controls, solenoid valves, relays and circuitry, and antifreeze protection shall operate from 120VAC, 60 Hz.	All controls, solenoid valves, relays and circuitry, and antifreeze protection shall operate from 120VAC, 60 Hz or 24VDC.	Added the option that all controls, solenoid valves, relay and circuitry, and freeze protection shall operate from 24VDC, as well as, 120VAC, 60 Hz to achieve better fleet standardization.
64	Ch. 15, Water and Waste System, Sec. 15.4.2,	The shroud shall be secured with captive fasteners so as to be easily removed and installed. Likewise, valves shall be easily accessible, without tools, for operation from inside the car.	If required for access to water and waste system valves, hoses or components, the shroud shall be secured with captive fasteners so as to be easily removed and installed. Likewise, valves shall be easily accessible, without special tools, for operation or maintenance from inside the car.	The TS requirements were predicated on a single assumed method of accessing equipment. Alternatives are acceptable so amendment to the TS language is required.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
65	Ch. 15, Water and Waste System, Sec. 15.4.3.1, Retention Tank, pg. 373	The rinse valve shall be mechanically opened by the tank discharge actuator.	The rinse valve shall be operated by the tank discharge actuator.	The requirement for mechanical control added complexity and cost. An alternative configuration is widely used on Amtrak equipment.
66	Ch. 15 Water and Waste System, Sec. 15.4.8.1, Status Panel, pg. 375	Toilet System | White | System Identifier (Goes on together with any indicator light below)	Normal | blue | System Identifier (Goes on together with any indicator below)	Changed the waste system status panel label from "toilet system (white) to normal (blue)" to be more effectively used when performing troubleshooting and make the Bi-level cars' status panels completely interchangeable with the LDSL status panels.
68	Ch. 15, Water and Waste System, Sec. 15.4.8.1, Status Panel, pg. 375	fault | RED | Waste system failure detected.	DRAIN OPEN | RED | Drain valve not closed.	Changed the waste system status panel label from "fault" to "drain open" to eliminate redundancy and provide specific guidance to maintenance personnel.
69	Ch. 16, Cab & Train Controls, Sec. 16.3, Design and Layout, pg. 384	The layout of the cab shall consider the engineer's relationship to the console and the windshield, and shall permit the engineer and assistant to have a continuous unobstructed field of view from 30 degrees above horizontal to a point on the tracks no more than 40 ft. (12m) from the end of the car.	The layout of the cab shall consider the engineer's relationship to the console and the windshield, and shall permit the engineer and assistant to have a continuous unobstructed field of view from an overhead signal 25 ft. (7.6 m) above top of rail 40 ft. (12 m) from the end of the car to a point on the tracks no more than 40 ft. (12 m) from the end of car.	The TS sighting requirements could not be met with 5th percentile woman or 95th percentile man. Alternative compliance requirements were required to meet the goals of the TS.
71	Ch. 16, Cab & Train Controls, Sec. 16.7, Engineer's Left Side Auxiliary Console, pg.	The Engineer's left side auxiliary console shall include: • Cab radio/PA handset and keypad • Headlight selector switch and control panel	The Engineer's left side auxiliary console shall include: • Cab radio/PA handset and control station • Headlight selector switch and control panel	Confusion over the terminology for existing control inputs in current vehicles and the requirements for the NGEC cars required clarification. A ""radio keypad" is not required.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
	391	• PTC Display panel • Windshield wiper control switch • Alerter acknowledgement light (duplicate to alerter status panel) • Car number plate	• PTC Display panel • Windshield wiper control switch • Alerter acknowledgement light (duplicate to alerter status panel) • Car number plate	
73	Ch. 16, Cab & Train Controls, Sec. 16.13.1, Brake Control System Features, pg. 398	B-3-B Emergency brake valves in assistant's side of the cab and in the passenger seating areas.	A Wabtec B-3-B emergency brake valve p/n 88566 or Wabtec emergency brake valve p/n 535026 shall be located in the Assistant's side of the cab.	The TS identified potentially conflicting requirements for the assistant's console. Clarification was required for what the overriding requirement should be.
74	Ch. 16, Cab & Train Controls, Sec. 16.15.1, Event Recorder, pg. 401	An event recorder/alerter system shall be provided. It shall be Wabtec Train Trax model TTX-REC-M5.	An event recorder/alerter system shall be provided. It shall be Bach-Simpson 54300.	Change the requirement for the event recorder/alerter system from Wabtec Train Trax model TTX-REC-M5 because the M5: 1. Cannot support the Crossing Light Control or horn Sequencer features specified in TS 16.23.1 & 16.24.1; 2. Haas limited I/O and cannot support the signals to monitor list requested in TS 16.15.1; 3. Does not have the capability to drive the remote indicator lamp, per TS 16.7.5; 4. Does not support the Panel Mount application requested for the Overhead Console per TS 16.8.2.
75	Ch. 16, Cab & Train Controls, Sec. 16.15.1, Event Recorder, pg. 401	An event recorder/alerter system shall be provided. It shall be Wabtec Train Trax-Rec Model TTX-REC -M5	An event recorder/alerter system shall be provided. It shall be Bach-Simpson 54300 recorder/alerter combo.	Changed the event recorder specification to Bach-Simpson 54300 recorder/alerter combo as this is a service proven model that will provide all the I/O, alerter, horn sequencing and crossing light control features required.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
78	Ch. 16, Cab & Train Control, Sec. 16.24.2, Bell, pg. 413	A 12 in. pneumatic bell with ringer shall be located under the end underframe at the F-end of the cab car.	Either a 12 in. pneumatic bell, or an electronic bell with sound characteristics and volume matching a typical locomotive 12 in. pneumatic bell, shall be located under the end underframe at the F-end of the cab car.	Add the option to provide an electronic bell with sound characteristics and volume matching a typical locomotive 12 in. pneumatic bell, which has no moving parts, thus requiring no maintenance and contains a pressure switch, allowing it to directly connect to an existing bell's airline, needing only two (2) additional wires.
83	Ch. 18, Materials and Workmanship, Sec. 18.9, Elastomers, pg. 443	All elastomer parts shall be of neoprene, or approved equal, unless otherwise specified.	All elastomeric parts, except for air system equipment, shall be of neoprene, or approved equal, unless otherwise specified.	Air system seals are often of elastomers other than neoprene. It was not intended to prohibit them in the TS. Clarification was required to allow them in specific circumstances.
84	Ch. 18, Materials and Workmanship, Sec. 18.9, Tests, pg. 444	All materials interior to the carbody must pass ASTM C1166-06 with a burn length = 4 in. (102 mm)	All elastomeric materials interior to the carbody must pass AST C1166-06 with a urn length = 4 in. (102 mm)	The TS states that, "all materials" must pass ASTM C1166-06, but Section 18.9.1 is a subsection of 18.9 "Elastomers" therefore should reference only elastomeric materials.
85	Ch. 18, Materials and Workmanship Sec. 18.9.3, Metal Parts, pg. 445	Metal parts to which elastomeric material is vulcanized shall be made of SAE 1020 or 1045 hot-rolled steel, except for air brake equipment.	Metal parts to which elastomeric material is vulcanized shall be made of SAE 1020 or 1045 hot-rolled steel, except air system equipment.	Air system seals are often of elastomers other than neoprene. It was not intended to prohibit them in the TS. Clarification was required to allow them in specific circumstances.
87	Ch. 18, Materials and Workmanship, Sec. 18.12.4, Honeycomb Panels, pg. 451	Stainless steel honeycomb panels shall be constructed in accordance with the requirements of SAE-AMS-STD-401.	Stainless steel or aluminum honeycomb panels shall be constructed in accordance with the requirements of SAE-AMS-STD-401.	The TS required material did not allow for aluminum in the frame.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
88	Ch. 18 Materials and Workmanship, Sec. 18.20.2, Air Conditioning and Refrigeration System Piping and Fittings, pg. 465	Air conditioning and refrigeration refrigerant lines shall be fabricated using type K copper tubing and wrought copper sweat type fittings.	Air conditioning and refrigeration refrigerant lines shall be fabricated using type k copper or ASTM B280 copper tubing and wrought copper sweat type or brazed type fittings.	Changed air conditioning lines requirement form being fabricated with using K type copper tubing and wrought copper sweat fittings to using standard ASTM B280 copper tubing with brazed type fittings, which is built to refrigerant standards.
89	Ch. 18, Materials and Workmanship, Sec. 18.21, Fiberglass Reinforced Plastic, pg. 467	FRP parts shall have a greater thickness at attachment points and edges.	FRP parts shall have sufficient thickness at attachment points and edges.	Changed requirement from FRP parts shall have a greater thickness at only attachment points and edges to all areas because the high stress areas are not necessarily just at the edges or attachment points.
90	Ch. 18, Materials and Workmanship, Sec. 18.29. 2, Availability and JEDEC Register pg. 492	All semiconductors shall be available from at least two manufacturers and available from U.S. distributors.	Function IC devices such as CPU may be available from only one manufacturer and shall be available from U.S. distributors. All other semiconductors shall be available from at least two U.S distributors.	Integrated circuits are not available from multiple manufacturers but are distributed by multiple suppliers. This method of compliance required confirmation.
92	Ch. 18, Materials and Workmanship, Sec. 18.3, Printed Circuit Board Standards, pg. 493	Compensation for manufacturing tolerances may be made through parallel precision resistors.	Compensation for manufacturing tolerances may be made through parallel and/or serial circuit.	Added that compensation for manufacturing tolerances may be made through serial circuit, as well as parallel, due to the possibility that resistors will be used in both parallel and serial circuit, and not only parallel connection.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
93	Ch. 18, Materials and Workmanship, Sec. 18.30.8, IC and Device Sockets, pg. 495	The rack and the edge of each board, or the card ejector, shall be labeled with corresponding numbers to identify board location within the enclosure.	The rack and the edge of each board, or the card ejector, shall be labeled with corresponding names and/or numbers to identify board location within the enclosure.	Added the option that the rack and the edge of each board, or the card ejector, can be labeled with names (and/or numbers) to identify board location within the enclosure.
94	Ch. 19, Test Requirements, Sec. 19.5.1.6.1, Test Description, pg. 512	The carbody supported on trucks or simulation thereof, shall be subjected to a vertical load test. The instrumented carshell shall be loaded to simulate AW3 loading.	The carbody supported on trucks or simulation thereof, shall be subjected to a vertical load test. The instrumented carshell shall be loaded to simulate AW2 loading.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
95	Ch. 19, Test Requirements, Sec. 19.5.1.6.2, Test Criteria, pg. 512	Carbody deflection, as measured during the vertical load tests under a load equal to the passenger load of AW3, is not more than the design camber in the side sill at any point between the carbody bolsters.	Carbody deflection, as measured during the vertical load tests under a load equal to the passenger load of AW2, is not more than the design camber in the ide sill at any point between the carbody bolsters.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
96	Ch. 19, Test Requirements, Sec. 19.5.1.10.1, Collison Post Elastic Test Test Description, pg. 516	A longitudinal test load as specified in APTA Standard SS-C&S-034-99 shall be applied to, and centered on, the collision post at an elevation 18 in. (457 mm) above the top of the underframe. This load shall be distributed over an area not to exceed the width of the collision post by 6 in. (152 mm) in height.	A longitudinal test load as specified in APTA Standard SS-C&S-034-99 shall be applied to, and centered on, the collision post at an elevation 18 in. (457 mm) above the top of the underframe (cab end and non-cab end). This load shall be distributed over an area not to exceed the width of the collision post by 6 in. (152 mm) in height.	The TS is incomplete and should have listed the loading conditions for cab end and non-cab end collision post arrangements rather than just the non-cab end 18 in. height.
97	Ch. 19, Test Requirements, Sec. 19.5.1.11.1, Corner Post Longitudinal Load Test, Test	Longitudinal test loads shall be applied to, and centered on, the corner post at an elevation of 18 in. (457 mm) and 30 in. (762 mm) above the top of the underframe as specified in APTA Standard SS-C&S-034-99.	Longitudinal test loads shall be applied to, and centered on, the corner post at an elevation of 18 in. (457 mm) and 30 in. (762 mm) above the top of the underframe (cab end and non-cab end) as specified in APTA Standard SS-C&S-034-99.	The TS is incomplete and should have listed the loading conditions for cab end and non-cab end corner post arrangements rather than just the non-cab end 18 in. height.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
	Description			
98	Ch. 19 Test Requirements, Sec. 19.5.2.1, Trucks, Allowable Stress, pg. 524	For the purpose of truck frame and component load and fatigue testing, the Contractor and/or the truck designer shall determine the maximum allowable stresses that the truck shall be designed to accommodate in order to perform without degradation over the 40-year useful life of the major components of the truck, under AW3 load conditions, all specified track conditions, and the truck's service life cycle as defined in this specification. The allowable stresses shall be determined using industry standard practice, and shall be submitted to the Customer for approval prior to the start of any truck fame load or fatigue testing.	For the purpose of truck frame and component load and fatigue testing, the Contractor and/or the truck designer shall determine the maximum allowable stresses that the truck shall be designed to accommodate in order to perform without degradation over the 40-year useful life of the major components of the truck, under AW2 load conditions, all specified track conditions, and the truck's service life cycle as defined in this specification. The allowable stresses shall be determined using industry standard practice, and shall be submitted to the Customer for approval prior to the start of any truck frame load or fatigue testing.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
99	Ch. 19, Test Requirements, Sec. 19.5.2.3, Truck Frame Load Tests, pg. 524	The truck frame and bolster shall be tested to verify that the maximum allowable stresses established by the Contractor and approved by the Customer under an AW3 load are not exceeded.	The truck frame and bolster shall be tested to verify that the maximum allowable stresses established by the Contractor and approved by the Customer under an AW2 load are not exceeded.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
100	Ch. 19, Test Requirements, Sec. 19.5.2.3, Truck Frame Load Tests, pg. 524	The vertical load component shall be 110% of the AW3 loaded carbody weight normally carried by the truck. The lateral component shall be 25 % of the vertical component. The longitudinal component shall be 15% of the vertical component.	The vertical load component shall be 110% of the AW2 loaded carbody weight normally carried by the truck. The lateral component shall be 25% of the vertical component. The longitudinal component shall be 15% of the vertical component.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
101	Ch. 19, Test Requirements, Sec. 19.5.2.4, Truck Frame Overload Tests, pg. 525	• Vertical load = 1.5 x AW3 weight per truck • Lateral load = 0.30 g ((0.01 oz.) x AW3 car weight per truck applied at the carbody center of gravity (note: this produces additional vertical loads on the truck)	• Vertical load = 1.5 x AW2 weight per truck • Lateral load = 0.30 g (0.01 oz.) x AW2 car weight per truck applied at the carbody center of gravity (note: this produces additional vertical loads on the truck)	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
102	Ch. 19, Test Requirements, Sec. 19.5.14.1, Pilot Car and Pilot Testing, Roll Angle Tests, pg. 545	The first pilot car, simulated to be at AW3 load, shall be placed upon a super-elevated track to determine compliance with the clearance requirements verifying the Contractor's clearance diagram despite any body roll and lateral shifting of the car body.	The first pilot car, simulated to be at AW2 load, shall be placed upon a super –elevated track to determine compliance with the clearance requirements, verifying the Contractor's clearance diagram despite any body roll and lateral shifting of the car body.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.
103	Ch. 19 Test Requirements, Sec. 19.5.14.2.1, Pilot Car and Pilot Testing, Pilot Train Testing, pg. 546	The cars with springs loaded statically to AW0 and AW3 conditions, shall be demonstrated by either testing (measured against a template, plumb line or other approved method) or analysis to confirm that the car conforms to the Contractor's designs and that all the specified clearances and static car envelope requirements have been met, both to wayside and rail.	The cars with springs loaded statically to AW0 and AW3 conditions, shall be demonstrated by either testing (measured against a template, plumb line or other approved method) or analysis to confirm that the car conforms to the Contractor's designs and that all the specified clearances and static car envelope requirements have been met, both to wayside and rail.	The TS originally required AW3 weight limits. These were considered too onerous and inappropriate for the type of operation contemplated and should be changed to AW2.

DCR 001-0222 Multiple List No.	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
104	Ch. 23, Customer Variables, Sec. 23.6, Café/Lounge and Café/Business Class Car Galley Equipment, pg. 603	The contractor shall provide food service chiller units, as specified in Chapter 14, that meet the requirements of California Department of Transportation Specification 14-107, revision A: Food Service Chillers, in addition to all other applicable provisions of the technical specification.	The Contractor shall provide food service chiller units, as specified in Chapter 14, that meet the requirements of California Department of Transportation Specification 14-107, revision A: Food Service Chillers, or approved equal, in addition to all other applicable provisions of the technical specification.	Provision of chillers operating from single phase power was proposed as a more appropriate solution. No advantage was seen for a three phase powered system.
106	Caltrans Spec 14-107, Sec. 6.3 Food Service Chillers	• The return air inlet shall be a round port, 6.25 in. in diameter, with center located at 27.375 in. from the bottom of chiller cased in 5.0 in. from right side of chiller unit • The chilled air discharge port shall be a rectangular opening at the bottom of the rear of the unit, and shall measure 6.0 in. tall by 4.0 in. wide, with the bottom of the opening located at 6.0 in. from the bottom edge of the chiller case, and the right edge of the opening shall be located 0.5 in from the right side of chiller unit.	• The chilled are discharge port shall be a round port, 6.25 in. in diameter, with center located at 27.375 in. from the bottom of chiller cased and 5.0 in. from right side of chiller unit. • The return air inlet shall be a rectangular opening at the bottom of the rear of the unit, and shall measure 6.0 in. tall by 4.0 in. wide, with the bottom of the opening located at 6.0 in. from the bottom edge of the chiller case, and the right edge of the opening shall be located 0.5 in. from the right side of chiller unit.	For food service chillers, having the supplied chilled air above the return is more efficient since it will take advantage of the natural tendency of warmer air to rise above colder air.

DCR Control Number 001-0223	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification (TS)
	Ch. 9, Interior, Section 9.6.2.3, Workstation Table	Section 9.6.2.3, paragraph 3: Energy absorption features shall be built into the workstation table and/or its attachments such that human injury criteria for the 50th percentile HIII male ATDs (Anthropomorphic Test Device -dummies) are not exceeded during dynamic sled testing, per the requirements specified in APTA standard SS-C&S-018-12, Section 5.2.1, modified for testing with a workstation table installed. The table must meet the performance requirements specified in Section 5.2.1.3 of APTA Standard SS-C&S-018-12. The table must not become detached from its mountings and the ATDs must remain compartmentalized between the table and the launch seat.	Revise to revert to Section 9.6.2.3, paragraph 3 from PRIIA Bi-level Specification, Rev. C: Energy absorption features shall be built into the workstation table and/or its attachments such that human injury criteria for the 50th percentile HIII male ATDs are not exceeded during dynamic sled testing, per the requirements specified in APTA Standard SS-C&S-016-99, Section 5.2.1, modified for testing with a workstation table installed. The table must meet the performance requirements specified in Section 5.2.1.3 of APTA Standard SS-C&S-016-99. The table must not become detached from its mountings and the ATDs must remain compartmentalized between the table and the launch seat.	Section 9.6.2.3 of the PRIIA Bi-level spec (the original and all revisions through C) specified that tables must be sled tested in accordance with the requirements in Section 5.2.1 of the seat standard, APTA SS-C&S-016-99, Rev. 2, modified to incorporate a workstation table. The table had to meet performance requirements (i.e., injury criteria for the head, chest, neck, and femur) in Section 5.2.1.3 of the seat standard. In the Bi-level spec., Rev. C.1, Section 9.6.2.3 was modified to refer to the APTA table standard (APTA SS-C&S-018-12) instead of the APTA seat standard (APTA SS-C&S-016-99), without changing any of the section numbers that were referenced, or references to "modified for testing with a workstation table installed".

DCR Control No. 001-0224	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change Technical Specification
	Ch. 12 Communications Section 12.3.3.2 and Ch. 13 Electrical System, Table 13-1 Communication Trainline Pin Assignments (Note: table 13-1 depicts Pin assignments for Caltrans, and as information only for Amtrak and APTA Standard references. The spec references are for all three entities. The 27 Pin standard has been in effect since 1992)	Ch. 13 Electrical Systems, Table 13-1, Communication Trainline Pin Assignments, Pins 24 & 25: Pin 24 Tape Music #2 (black) (spare) Tape Music #2 (black) (spare) Tape Music # 2 (black) Pin 25 Tape Music #2 (white) (spare) Tape Music #2 (white) (spare) Tape Music #2 (white)	Ch. 13, Table 13-1, Communication Trainline Pin Assignments: Pin 24 ETW CONTROL (BLK) (spare) Tape Music #2 (black) (spare) Tape Music #2 (black) Pin 25 ETW CONTROL (WHT) (spare) Tape Music #2 (white) (spare) Tape Music #2 (white)	To implement an effective Emergency Two-Way Communication (ETW) system, Caltrans is requesting that Communications (COMM) trainline pins 24 & 25 be re-allocated for use as ETW control lines, to support system functionality for the ETW system on the NGEC bi-level cars. Analog Train Line (ATL) COMM Pins 24 & 25 are currently designated to provide passenger tape music, which is no longer required. These pins are not currently utilized. This change will have no impact on existing communications services within legacy cars. There are insufficient lines available within the current intercity COMM ATL configuration for the provision of a fully functional ETW system. Using the ATL as the primary means for communication between all cars in a consist will provide compatibility with existing fleets and legacy cars which do not have an intelligent PA/IC controller installed. This will set a new standard for pin use within the intercity COMM ATL, providing a new common national standard for ETW implementation on analog train lines.

DCR Control No. 001-0225 Multiple List Number	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change to Technical Specification
1	Ch. 4, Carbody, Section 4.13.1, Glazing Materials	3rd paragraph A permanent protective veneer shall be applied to the exterior surface of all glazing material. This protective covering shall significantly improve the abrasive resistant qualities of the glazing to abrasive materials, natural atmospheric acids, strong cleaning chemicals and cleaning brushes encountered during normal operating and cleaning conditions.	3rd paragraph A permanent protective veneer shall be applied to the exterior of all glazing material that is made of polycarbonate. This protective covering shall significantly improve the abrasive resistant qualities of the glazing to abrasive materials, natural atmospheric acids, strong cleaning chemicals and cleaning brushes encountered during normal operating and cleaning conditions.	Added language to clarify that permanent protective veneer only needs to be added when the glazing material is made of polycarbonate.
2	Ch. 6, Couplers and Draft Gear, Sec. 6.3 Performance Requirements	The centering mechanism shall maintain the coupler on the vehicle center line when in the uncoupled condition.	The centering mechanism shall maintain the coupler on the vehicle center line when in the uncoupled condition, on the F-end of the cab/baggage car only.	Changed requirement because intercity cars normally have a coupler centering device at the F-end only. Coupler centering on non-F ends will result in excess coupler wear.
3	Ch. 9, Interior, Sec. 9.4.10, Overhead Luggage Storage	5th paragraph The bin structure and attachment to carbody shall have sufficient strength to support a load of 250 lbs. (114 kg), applied over a10 in. by 10 in. (254 mm by 254 mm) area, midway between adjacent supports with a deflection not to exceed 0.25 in. (6.35 mm) (including rack itself and its attachment to carbody) and without fracture or permanent deformation.	5th paragraph The bin structure and attachment to carbody shall have sufficient strength to support a load of 250 lbs. (114 kg) (125 lbs. (57 kg) for a half-size bin), applied over a 10 in. by 10 in. (254 mm by 254 mm) area, midway between adjacent supports with a deflection not to exceed 0.25 in. (6.35 mm) (0.125 in (3.18 mm) for a half size bin) (including rack itself and its attachment to carbody) and without fracture or permanent deformation.	Defined the weight associated with the 8g/4g/4g design strength requirements for overhead luggage bins that are half the size of full luggage bins.

DCR Control No. 001-0225 Multiple List Number	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change to Technical Specification
4	Ch. 11, Lighting Systems, Sec. 11.6.3, Toilet Rooms	The toilet OCCUPIED/OUT OF SERVICE light fixture shall be mounted on the toilet room exterior wall, adjacent to the toilet room door for all toilet rooms. This light shall consist of a two-light LED fixture with a sign containing text and/or a pictorial symbol which provides indication as to when the toilet room door is locked (occupied) and a second light that provides indication that the toilet room is "out of service" (when the toilet system is not functioning). Lights shall be on when the toilet is occupied or out of service, and shall be extinguished when the toilet is available for use. These LEDs shall be yellow.	The toilet OCCUPIED/OUT OF SERVICE Light fixture shall be mounted on the toilet room exterior wall, adjacent to the toilet room door for all toilet rooms. This light shall consist of an LED fixture with a sign containing text and /or a pictorial symbol which provides indication as to when the toilet room door is locked (occupied) and a second light that provides indication that the toilet room is "out of service" (when the toilet system is not functioning). Lights shall be on when the toilet is occupied or out of service, and shall be extinguished when the toilet is available for use. Final design of the toilet OCCUPIED/OUT OF SERVICE light fixture shall be subject to Customer approval.	Clarified the requirements and functionality of the toilet "occupied/out of service" light fixture to allow the design to be approved by the Customer. Removed requirement that the LEDs be yellow.
5	Ch. 13 Electrical System, Sec. 13.9 DC Power Distribution System, Sec. 13.9.2, 24 VDC Power System	The reading lights shall be protected by a dedicated 24 VDC circuit breaker	The reading lights shall be protected by a dedicated circuit breaker.	Revised to allow alternate compliance including power distribution to the reading lights and circuit protection.
6	Ch. 14 Food Service, Sec. 14.5.7, Refrigerator for Crew Use	An industrial/transportation grade, self-contained under –counter style refrigerator shall be provided in the lower level service galley for the use of the crew and not for storage of food to be sold to the public. This refrigerator shall be SubZero model UC-24R.	An industrial /transportation grade, self-contained under –counter style refrigerator shall be provided in the lower level service galley for the use of the crew and not for storage of food to be sold to the public. This refrigerator shall be SubZero model UC-24R or approved equivalent.	Added or approved equivalent to allow for more choices

DCR Control No. 001-0225 Multiple List Number	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change to Technical Specification
7	Ch. 14, Food Service, Sec. 14.14, Lighting	Lighting in the upper level galley and lower level storage area shall be along the entire length of the countertops, including track lighting over the service counter and storage shelves.	Lighting in the upper level galley and lower level storage area shall be along the entire length of the countertops, including suitable lighting over the service counter and storage shelves.	Replaced the requirement for track lighting to spot lighting because track lighting was not needed.
8	Ch. 15, Water and Waste System, Sec. 15.3.3, Pressurization System	Air pressure for water rising shall be set for 45.0 psig (3.1 bar g) ± 2.0 psig (0.1 bar g).	Air pressure for water rising shall be set for 35.0 psig (2.4 bar g) ± 2.0 psig (0.1 bar g)	Reduced the air pressure by 10 psig for interchangeability with the current fleet.
9	Ch. 15, Water and Waste System, Sec. 15.4.2.5,	• 1.0-1.5 second RINSE activated 0.5 – 0.7 seconds from flush initiation; and • 3.0-3.5 second DRAIN activated 1.0 – 1.5 seconds from flush initiation.	• 0.5 to 1.5 second RINSE activated 0.5 to 1.5 seconds from flush initiation; and • 3.0 – 3.5 second DRAIN activated 1.0 to 2.0 seconds from flush initiation	Made three small performance driven deviations to the flush cycle timing.
10	Ch. 15 Water and Waste System, Sec. 15.4.3.1, Retention Tank	A 28.0 psig (1.9 bar g) ± 2.0 psig (0.1 bar g) rinse shall automatically apply fresh rinse water at a rate of 3 gpm (11 L/min) to 6 gpm (23 L/min) to the sides of the tank during the drain cycle.	A 35.0 psig (2.4 bar g) ± 2.0 psig (0.1 bar g) rinse shall automatically apply fresh rinse water at a rate of 3 gpm (11 L/min) to 6 gpm (23 L / min) to the sides of the tank during the drain cycle.	Raised the air pressure by 7 psig for interchangeability with the current fleet.
11	Ch. 15 Water and Waste System, Sec. 15.4.8, Indicators	LOW AIR RED Less than 60.0 psig (4.1 bar g) of air pressure	LOW AIR RED Less than 80.0 psig (5.4 bar g) of air pressure	Revised because the transfer used in the waste systems require a minimum of 80 psig for efficient operation
12	Ch. 16 Cab and Train Controls, Sec. 16.5.3.3, Engineer's Console Equipment – Horn Push Button	A two-position push button shall be mounted on the desktop console for control of the horn. The button shall be blue mushroom-head style, and shall have positions for low volume (partially depressed) and high volume (fully depressed). Cutler-Hammer p/n 10250ED 1309-5.	A two-position push button shall be mounted on the desktop console for control of the horn. The button shall be blue mushroom –head style, and shall have positions for low volume (partially depressed) and high volume (fully depressed).	Remove and obsolete part number.

DCR Control No. 001-0225 Multiple List Number	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change to Technical Specification
13	Ch. 16 Cab and Train Controls, Sec. 16.18.4, Windshield Wipers	The windshield wiper motor assembly (with blade attached) shall be accessible and replaceable from inside the cab.	The windshield wiper motor assembly (with blade attached) shall be accessible and replaceable from inside or outside of the cab.	Changed the requirement for the capability of removing the wiper arm and blade from inside the operator's cab because it would add complexity to the design and possibly create additional leak paths. Also, removal and replacement from the exterior of the cab simplifies the maintenance of this item, and will require fewer labor hours to perform this function.
14	Ch. 18 Materials and Workmanship, Sec. 18.2.2, Marking and Storage	All dated material shall have the expiration date clearly marked. Expired material or material expiring within one year of car acceptance shall not be used, except caulks and sealants, which may be used if not expired.	All dated material shall have the expiration date clearly marked. Expired material or material expiring within one year of car acceptance shall not be used, except paints, adhesives, caulks and sealants, which may be used if not expired.	Added paint and adhesives to the exceptions because they can be used up to their respective expiration dates, which is normal industry practice.
15	Ch. 18 Materials and Workmanship, Sec. 18.15.6 Welding and Brazing-Penetration	Penetration of weld metal into the bottoms of angles and vees and fusion, shall be complete. Weld metal shall run into the base metal at the finished surface of the weld in a smooth curve approximately tangent to the surfaces of the base metal so as to avoid sudden change of section and resultant concentration of stress. Undercutting shall not exceed 10% of the thickness of the thinnest element, or 0.03 in. (0.76 mm) whichever is less.	For any welds considered and / or identified as Complete Joint Penetration (CJP), penetration of weld metal into the bottoms of angles and vees and fusion, shall be complete. Weld metal shall run into the base metal at the finished surface of the weld in a smooth curve approximately tangent to the surfaces of the base metal so as to avoid sudden change of section and resultant concentration of stress. This does not apply to welds considered and /or identified as Partial Joint Penetration (PJP).	Undercut should be limited to the amount permitted by AWS D1.1 not the less stringent limits in the Technical Specification.

DCR Control No. 001-0225 Multiple List Number	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change to Technical Specification
16	Ch. 18 Materials and Workmanship, Sec. 18.24.7, Wire and Cable - Undercar	The 480 Vac trainline conductors shall be cleated in place or run in rigid conduit. All undercars wiring no smaller than No. 6 AWG shall be run in Rigid Galvanized Steel (RGS) conduits in an approved manner.	The 480 Vac trainline conductors shall be cleated in place; No. 6 WG and larger may be cleated in place or run in rigid conduit. All undercar wiring smaller than No. 6 WG shall be run in Rigid Galvanized Steel (RGS) or Rigid Aluminum (RACP) conduits in an approved manner.	Revised conduit material to allow the use of aluminum resulting in a weight savings.
17	Ch. 18 Materials and Workmanship, Sec. 18.25.2 Wire and Cable Connections – Wire Terminations	Spade and hook- type terminals shall not be used.	Spade and hook-type terminals shall not be used, unless approved otherwise by the Customer in writing.	Revised to allow the use of a locking hook-type terminal on a case-by-case basis.
18	Ch. 18 Materials and Workmanship, Sec. 18.25.4, Wire and Cable Connections – Cable Connectors	All cable connectors shall conform to MIL –C-5015, or an equivalent standard as approved by the Customer.	All cable connectors shall conform to MIL-DTL-26842, or an equivalent standard as approved by the Customer.	Changed to a connector which is available in a wider range of pin counts and gauges.
19	Ch. 18, Materials and Workmanship, Sec. 18.28.3, Electrical Devices and Hardware – Circuit Breakers	All circuit breakers of the same rating shall be of the same manufacture and model throughout the vehicle.	All circuit breakers of the same rating shall be of the same manufacture and model throughout the vehicle, unless approved otherwise by the Customer.	Revised to allow narrower circuit breakers in the cab and food service areas due to space constraints.
20	Ch. 18, Materials and Workmanship, Sec. 18.30, Printed Circuit Board Standards	Circuit board material shall be per MIL –P-13949, with a minimum thickness of 0.06 in. (1.59 mm) using type GB or GH base material.	Circuit board material shall be per IPC 4101, with a minimum thickness of 0.06 in (1.59 mm) using type GB or GH base material.	Revised to allow compliance to IPC 4101 which has replaced MIL-P-13949.
21	Ch. 19, Test Requirements, Sec. 19.5.6.1, Interior – Overhead Luggage Storage Bins	A complete overhead luggage storage bin, mounted on simulated carbody structure, shall be tested to verify it meets the 250 lb. (114 kg) load requirement.	A complete overhead luggage storage bin, mounted on simulated carbody structure, shall be tested to verify it meets the 250 lb. (114 kg) load requirement (125 lbs. (57 kg) for half-size bins).	Defined the weight associated with the 8g/4g/4g demonstration test requirements for overhead luggage storage.

DCR Control No. 001-0225 Multiple List Number	Tech Spec Chapter Reference	Spec Language to be Changed or Deleted	Suggested Replacement Language	Rationale for Requested Change to Technical Specification
22	Ch. 19, Test Requirements, Sec. 19.6.13.10, Production Tests, Carbody -Windshield Wipers Operation	The test shall verify proper operation of each wiper unit, including: smooth movement, sweep over the required area of the windshield, speed control, parking position, noise and freedom from air leaks. Also test proper operation of washer.	The test shall verify proper operation of each wiper unit, including: smooth movement, sweep over the required area of the windshield, speed control, parking position, noise and freedom from air leaks. Also test proper operation of washer (if present).	Removed the requirement for a windshield washer test because the Technical Specification does not require a washer function.

After a thorough review and technical specification verification of each listed DCR, it is Mr. Salci's professional opinion that all of the Table 1 Urgent and Major DCRs should be forwarded to the Executive Board for approval. The recommended DCRs (001-0222, 001-0223, 001-0224, and 001-0225) will improve the Bi-level vehicle technical specification with improved clarity and specificity which will improve the technical specification to the benefit of both the existing procurement (document control and configuration management) and the procurement of future bi-level vehicles utilizing the NGEC technical specification. These DCRS are also consistent with the goal to provide for the standardization of all NGEC technical specifications. None of the recommended Urgent and Major changes will negatively impact any of the design objectives, performance criteria, safety, reliability or operations and maintenance criteria contained in the Executive Board's Requirements Document for the Bi-Level Vehicle Technical Specification. Therefore, all the listed DCRs in Table 1 are recommended for approval.