

SCRTD  
METRO RAIL PROJECT  
SAFETY CERTIFICATION PROGRAM  
CRITERIA CONFORMANCE CERTIFICATION

CONTRACT A612

CONTACT RAIL

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## INTRODUCTION

This Criteria Conformance Verification package is submitted for review and compliance assessment in accordance with Rev. 1.1 of the SCRTD Metro Rail Project Safety Certification Plan dated June 1988. The purpose of this package is to document the incorporation of safety-related design criteria into the contract drawings and specifications. This activity is part of a multi-phased program to provide a traceable history of the Metro Rail Project Safety Program.

During design progression, MRTC Safety, Assurance & Security personnel, in conjunction with Rolf Jensen & Associates and the Metro Rail Project Fire/Life Safety Committee, have reviewed design documents at the 60%, 85%, 100%, and Legal/Technical levels. The 100% design review for this document was held in May and June 1985. At each review level design review checklists were utilized and appropriate design review comments generated. Subsequent reviews were initiated by determining the resolution status of comments. Unresolved comments were repeated at each review level until resolution was achieved and verified.

Design review checklists for the Fire/Life Safety, System Safety, Security and System Assurance design criteria were updated in December 1986 to reflect the significant revisions made through the Change Request process. A vertical bar in the Req. I.D. column of the checklist was used to indicate only those changes which impacted design. For clarity, editorial revisions and clarifications of intent were not indicated on the checklist; however, all revisions were indicated in the text of the design criteria and pertinent Change Requests.

The scope of this contract encompasses manufacturing, testing, and delivering of the contact rail, support insulators, and associated hardware, including side approach sections, end approach sections, anchor assemblies, expansion joint assemblies, and splice joint assemblies. This contract excludes handling and storage after delivery.

The comments included in this package represent the result of the reviews performed at the 100%. The checklists included are the updated checklists applied at the 100% review. Checklist references to specific drawing numbers or specific sections are based on the conformed contract documents. Only the Quality Assurance checklist is included in this document as it is the only portion directly applicable to this contract. Design group responses to the comments are included in most cases, as well as resolution verification by MRTC Safety, Assurance, and Security personnel. Supporting correspondence has been included where deemed appropriate.

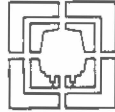
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This verification package, once audited and confirmed by the SCRTD, will become the primary documentation to allow the SCRTD to issue a Criteria Conformance Certification Certificate. Once issued, the Certificate will be appended to this document.



**RTD**  
Metro Rail Project

# CRITERIA CONFORMANCE VERIFICATION



**Metro Rail Transit Consultants**  
DMJM/PBQD/KE/HWA

## Safety Certification Program

DESIGN REVIEW CONTRACT NUMBER A612 Contract Rail

REVIEWING DISCIPLINE MRTC Safety, Assurance & Security

EXCEPTIONS NOTED: None

This verifies that the specifications and drawings of the above DESIGN REVIEW PACKAGE comply with the applicable SCRTD DESIGN CRITERIA for safety, fire/life safety, security and system assurance.

Signature J. N. Brown Date 7/7/89  
Manager - MRTC Safety, Assurance & Security

Signature [Signature] Date 7/10/89  
Manager - MRTC System Division





# METRO RAIL PROJECT DESIGN REVIEW CHECKLIST

CERTIFIABLE ELEMENT: CONTACT RAIL

GROUP: MRTC-SAFETY, ASSURANCE & SECURITY

DATE: 11/17/88

REVIEWER: R. HARVEY

DISCIPLINE: QUALITY ASSURANCE

REVIEW REFERENCE: METRO RAIL PROJECT SYSTEM DESIGN

CONTRACT No.: A612

CRITERIA AND STANDARDS - VOL. 1, SECTION 5.4

REVIEW LEVEL: 100%

REQ. I.D.	REQUIREMENT	YES	NO	COMMENT
5.4.1.B	<p>QUALITY ASSURANCE PROGRAM PLAN - CONTRACTORS</p> <p>Manufacturers of the following system elements shall be required by contract to establish and maintain a QA Program and Plan:</p> <ol style="list-style-type: none"> <li>1. Facilities</li> <li>2. Vehicle</li> <li>3. Train Control</li> <li>4. Fare Collection</li> <li>5. Communications</li> <li>6. Escalators</li> <li>7. Elevators</li> <li>8. Auxiliary Vehicles</li> </ol> <p>These plans shall be prepared using the SCRTD System Assurance Program Plan and the SCRTD QA Manual as a guide for style, content, and format.</p>			<p>A detailed Quality Assurance Program is not required by the Design Criteria and Standards for the Contact Rail Procurement Contract. However, due to the nature of this Contract, certain basic, minimum Q.A. requirements have been imposed.</p>
		X		See TP Section 5, Article 5.3
5.4.2	<p>WARRANTIES</p> <p>A. Warranty provisions shall be included in all contracts, both civil and system.</p> <p>The following additional time warranties shall be included in the vehicle contract:</p> <ol style="list-style-type: none"> <li>1. Carbody - 5 years</li> <li>2. Truck-Structural Elements - 5 years</li> </ol>			See General Conditions Article 19, and Spec. Conditions Article 4
		X		



# SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

## METRO RAIL PROJECT DESIGN REVIEW CHECKLIST

CERTIFIABLE ELEMENT: CONTACT RAIL

GROUP: MRTC-SAFETY, ASSURANCE & SECURITY

DATE: 11/17/88

REVIEWER: R. HARVEY

DISCIPLINE: QUALITY ASSURANCE

REVIEW REFERENCE: METRO RAIL PROJECT SYSTEM DESIGN

CONTRACT No.: A612

CRITERIA AND STANDARDS - VOL. 1, SECTION 5.4

REVIEW LEVEL: 100%

REQ. I.D.	REQUIREMENT	YES	NO	COMMENT
5.4.3	3. Traction Motors, except brushes - 5 years			
	4. Gear reducers for propulsion subsystem - 5 years.			
	QUALITY PROGRAM CONTENT			
	A. <u>Receiving Inspection</u>			
	Contractors shall provide for the inspection of all incoming material. Statistical sampling is acceptable.	X		See TP Section 5, ¶ 5.2.A
	All material certifications and test reports used as the basis for acceptance by the contractors shall be maintained as quality records.			
	B. <u>Statistical Sampling Plans</u>			
	Statistical sampling used in inspection shall be fully documented and based on generally recognized statistical practices, such as MIL-STD-105 or MIL-STD-414.			N/A See Qualification Testing, TP, Section 4 Article 4.6
	C. <u>Changes to Drawings and Specifications</u>			
	Contractors shall ensure that all inspection and acceptance test are based on the latest revision or changes to drawings and specifications.	X		See TP Section 6, Article 6.2





# SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

## METRO RAIL PROJECT DESIGN REVIEW CHECKLIST

CERTIFIABLE ELEMENT: CONTACT RAIL

GROUP: MRTC-SAFETY, ASSURANCE & SECURITY

DATE: 11/17/88

REVIEWER: R. HARVEY

DISCIPLINE: QUALITY ASSURANCE

REVIEW REFERENCE: METRO RAIL PROJECT SYSTEM DESIGN

CONTRACT No.: A612

CRITERIA AND STANDARDS - VOL. 1, SECTION 5.4

REVIEW LEVEL: 100%

REQ. I.D.	REQUIREMENT	YES	NO	COMMENT
	An acceptable configuration management and control system shall be established and maintained.			
	The responsibility for control of changes shall extend to suppliers.			
D.	<u>Identification of Inspection Status</u>			
	Contractors shall maintain a system for identifying the progressive inspection status of components or materials as to their acceptance, rejection or non-inspection.	X		See TP Section 5, ¶ 5.2.C
E.	<u>Shipping Inspection</u>			
	Contractors shall provide for the proper inspection of products to ensure completion of manufacturing and conformance to contract requirements prior to shipment.	X		See General Conditions, Article 20
F.	<u>Quality Assurance Organization</u>			
	The organization of each contractor's QA Program shall be well defined.	X		See TP Section 5, Article 5.2
	QA personnel shall have sufficient, well-defined responsibilities and organizational freedom which encourage the identification and evaluation of quality problems.	X		TBD upon review of Contractors Submittal



# SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

## METRO RAIL PROJECT DESIGN REVIEW CHECKLIST

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DATE: 11/17/88

REVIEWER: R. HARVEY

DISCIPLINE: QUALITY ASSURANCE

REVIEW REFERENCE: METRO RAIL PROJECT SYSTEM DESIGN

CONTRACT No.: A612

CRITERIA AND STANDARDS - VOL. 1, SECTION 5.4

REVIEW LEVEL: 100%

REQ. I.D.	REQUIREMENT	YES	NO	COMMENT
	Contractors shall have a QA Program that can verify compliance with contract requirements.			See TP Section 5, Article 5.3
G.	<u>Qualification of Personnel</u>			
	Contractor personnel performing inspections, test or special processes shall be qualified for such work based on prior experience and training.	X		TBD upon review of Contractors Submittal
	Records of personnel qualifications shall be maintained and available for review.	X		TBD upon review of Contractors Submittal
H.	<u>In-Process Inspection</u>			
	The contractor shall ensure that all machining, wiring, batching, shaping, and all basic production operations, together with all processing and fabricating, shall be accomplished under controlled conditions.	X		See TP Section 5, ¶ 5.2.C
I.	<u>Handling, Storage and Delivery</u>			
	Contractors shall provide adequate work and inspection instructions for handling, storing, preserving, packing, marking, and shipping to protect the quality of products and to prevent damage, loss, deterioration, or substitution thereof.	X		TBD upon review of Contractors Submittal



# SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

## METRO RAIL PROJECT DESIGN REVIEW CHECKLIST

CERTIFIABLE ELEMENT: CONTACT RAIL

GROUP: MRTC-SAFETY, ASSURANCE & SECURITY

DATE: 11/17/88

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REVIEW REFERENCE: METRO RAIL PROJECT SYSTEM DESIGN

CONTRACT No.: A612

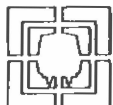
CRITERIA AND STANDARDS - VOL. 1, SECTION 5.4

REVIEW LEVEL: 100%

REQ. I.D.	REQUIREMENT	YES	NO	COMMENT
	<p>J. <u>Corrective Action</u></p> <p>Contractors shall establish, maintain, and document procedures to ensure that conditions adverse to quality are promptly identified and corrected.</p>	X		TBD upon review of contractors submittal
	<p>K. <u>Nonconforming Material</u></p> <p>Contractors shall establish and maintain an effective system for controlling nonconforming material including procedures for identification, segregation, and disposition.</p> <p>A Material Review Board consisting of appropriate SCRTD, contractor, QA and design personal shall be established.</p>	X		TBD upon review of Contractor Submittal

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**DESIGN REVIEW COMMENTS**

REVIEWER M. INGRAM FILE NO. W550A630 ORGANIZATION S, A 15-QA  
DRAFT  
FINAL % SUBMITTAL FOR AB12 Contact Rail Specs.

REF. NO.	PAGE NO.	DRAWING NO./ SPEC. SECTION	COMMENTS	RESPONSE	ACTION
1	TP-2-2	2.6	ENSURE ABBREVIATIONS AND DEFINITIONS ARE NORMALIZED WITH THE SCRTD GLOSSARY OF ABBREVIATIONS AND DEFINITIONS FOR THE METRO RAIL PROJECT. SEE REF. NO. 1 FOR THE AB15 COVERBOARD REVIEW.		OK RM 11-21-88
2	TP-4-7	4.7	COMMENT NO. 93, PAGE 12 OF 15 OF TYPEWRITTEN COMPILATION OF AB12 COMMENTS COULD NOT BE DETERMINED AS HAVING BEEN RESOLVED. PLEASE INDICATE INTENT.	Will investigate See response to comment No. 93 RM 5-2-89	
3	TP-4-2 TP-8-2	4.5.4 TABLE TP-8-1	THE QUALIFICATION TEST CERTIFICATION IS STILL CALLED OUT IN THE TEXT AS A CDRL ITEM, BUT IS NOT REFLECTED IN THE TABLE. THIS SAME PARA. 4.5.4 WAS DELETED ENTIRELY FROM THE AB15 SPECS. CLARIFY		OK RM 11-21-88
			THE FINAL DESIGN REVIEW CHECKLIST FOR QA WILL BE COMPLETED UPON FINAL ISSUE OF THE 100% DOCUMENTS.	NONE REQ'D.	







**DESIGN REVIEW COMMENTS**

REVIEWER M. INGRAM FILE NO. W001A630 P.10 ORGANIZATION S, A95  
100 % SUBMITTAL FOR TRACTION POWER PROCUREMENT - A630  
A612, A615 & A630

REF. NO.	PAGE NO.	DRAWING NO./ SPEC. SECTION	COMMENTS	RESPONSE	ACTION
			COVERBOARD A615		
1	TP-8-2	TABLE TP-8-1	Item No. 6 - TITLE should be Quality Assurance <u>PROGRAM</u> ; REFERENCE PARA. should be 5.3.	Will correct.	
			CONTACT RAIL A612		
2	TP-8-2	TABLE TP-8-1	Item No. 09 - REF. PARA. should be 5.3.	Will correct.	<i>alg</i> 11-21-88
			SUBSTATION EQUIPMENT A630		
3	SP-5	7.3	Line 4 - Exhibit TP-1-1 should be Appendix TP-1-A in order to be consistent with ACTUAL TERM USED.	Will correct.	
4	TP-9-3	9.15	Title should read IDENTIFICATION OF INSPEC-TION STATUS.	Will correct.	
5	TP-11-2	11.1.5	Calibration certificates should be indicated as	Will indicate.	







METRO RAIL TRANSIT CONSULTANTS  
DMJM/PBQD/KE/HWA

Cross Reference  
section III  
BCC #

DATE Jun. 1 '85  
SHEET 1 OF 1

**DESIGN REVIEW COMMENTS**

REVIEWER D.R. FIEDLER FILE NO. \_\_\_\_\_ ORGANIZATION ROLF JENSEN & ASSOC  
100 % SUBMITTAL FOR A-612 CONTACT RAIL

REF. NO.	PAGE NO.	DRAWING NO./ SPEC. SECTION	COMMENTS	RESPONSE	
1	TP-1-2	1.2.D	Analyses to date for existing have used a maximum vehicle capacity of 220. Either 160 should be provided for standing at crush load or additional analysis and possibly additional seating facilities may be required.	Will delete the sentence	text now reads "Over 200 Standing Passengers"
2	TP-1-3	1.2.D	Delete "part of" from last sentence	Will delete	ok'd 11-2-88
3	TP-4-6	4.6.2	Add a new paragraph, "E. Flameability and Smoke Development Test samples of Type II support insulator molting compound shall in accordance with ASTM D635, E162 and E662. The results of all tests shall meet the requirements of sections 3.16.6 K, L and M.	Will add	ok'd 11-2-88
<del>4</del>	<del>TP-2-7</del>	<del>1.2.D</del>	<del>Delete "part of" from last sentence</del>	<del>Will delete</del>	<del>ok'd 11-2-88</del>







SCRIPD METRO RAIL  
A612 - CONTACT RAIL - DRAWINGS

PRE-FINAL REVIEW

<u>NO.</u>	<u>REVIEWER</u>	<u>DATE</u>	<u>DRAWING NO.</u>	<u>COMMENT</u>	<u>RESPONSE</u>
1.	B. Hansson (RTD)	01/25/85	P-147	End approach assembly is not shown as described in 3.12.	AGREE. WILL DELETE REFERENCE TO SECTION A, AND ADD BELB AGCE
2.	B. Hansson (RTD)	01/25/85	P-146 P-147	Make the expansion joint design the same for Type I and II contact rails, (two vs. one gap).	AGREE. WILL REVISE DWGS AND SPECS
3.	B. Hansson (RTD)	01/25/85	P-150	Rail clips must allow for expansion and contraction of the contact rail.	AGREE. WILL INCLUDE REQUIREMENT IN SPECS.
4.	B. Hansson (RTD)	01/25/85	P-150 P-151	Shims under base for adjusting height should be part of this contract or in installation contract.	SHIMS ARE SPECIFIED IN TRACK-WORK INSTALLATION CONTRACT A610
5.	T.W. Cook	02/05/85	P-150 P-155	There are two clips for contract rail attachment to insulator shown on P-150 to Type I insulator and not any reference to rail fastening device to Type II insulator. Please clarify why it's not needed.	AGREE. WILL ADD CLIPS
6.	B. Hansson (RTD)	01/25/85	P-151	Why not two-hole mounting as for Type I support insulator.	AGREE. WILL CHANGE TO TWO-HOLE
7.	B. Hansson (RTD)	01/25/85	P-151	Hold-down rail clips will be required if used with Type II contact rail.	SAME AS NO. 5
8.	Fire/Life Safety Comm.	01/22/85	P-151	Section "B" dwg. does not depict Type of rail as is shown on dwg. P-150.	AGREE. WILL SHOW TYPE OF RAIL ON DWG P-151 <i>ok</i> <i>11-21-88</i>

SCRTD METRO RAIL  
A612 - CONTACT RAIL - SPECIFICATIONS

PRE-FINAL DESIGN REVIEW

<u>NO.</u>	<u>REVIEWER</u>	<u>DATE</u>	<u>PARAGRAPH</u>	<u>PAGE</u>	<u>COMMENT</u>	<u>RESPONSE</u>
1	B. Hansson (RTD)	01/25/85	N/A	ITB-1 ITB-3	These two page numbers are repeated in two sections: Invitation to Bid and Contract Forms	AGREE. WILL REVISE
2	E. Leard	01/23/85	N/A	ITB-2	Reduce cost of set of Bid Documents from \$100.00 to \$25.00 (or less) \$100.00 is too much for this pkg!!	AGREE. COST WILL BE REDUCED
3	W.J. Armento	01/25/85	6.2	ITB-6	Second line refers to "the equipment the bidder will supply.  There is no equipment to be provided in this contract. There are products or items on ITB-19; reference is made to "each bid item". It therefore appears appropriate that "the equipment" be changed to read "each bid item".	AGREE. WILL CHANGE TO "EACH BID ITEM"
4	W.J. Armento	01/25/85	N/A	ITB-15	The Technical Provisions do not contain any measurement or payment clauses, so the adequacy or accuracy of the Bid Form listing cannot be ascertained.  It appears, however, that Items 3 through 8 would have to be shown separately for each of the two types of rails since the materials forming the respective assemblies are different for each type.	DISAGREE. PAYMENT IS IN G.P. AND MEASUREMENT IS IN BID FORM  DISAGREE. ONLY ONE TYPE OF RAIL WILL BE BID. ITEMS 3 TO 8 SHOULD BE FILLED SPECIFICALLY FOR THAT TYPE OF RAIL

NO.	REVIEWER	DATE	PARAGRAPH	PAGE	COMMENT	RESPONSE
5.	R. Frias (PBCD)	01/25/85	N/A	ITB-15	Add construction account numbers to bid form.	COMMENT NOT CLEAR ARE CONSTRUCTION ACCOUNT NOS. AVAILABLE
6.	P.T. Bakas	01/29/85	N/A	ITB-15	Typo "Sourhern" -- Southern	WILL REVISE
7.	W. Robertson (PDCD)	01/25/85	N/A	ITB-15	Add Bid item for side approach assembly which is specified in paragraph 3.14 on page 3-8.	WILL ADD
8.	P.T. Bakas	01/29/85	N/A	ITB-16	Add item 13 "side approach assemblies".	SAME AS NO. 7
9.	R. Lontok (PDCD)	01/25/85	N/A	ITB-16	Add item 13 for side approach assembly per drawing P-148 sheet no. 5.	SAME AS NO. 7
10.	R. Frias (PDCD)	01/25/85	3.C.2	ITB- <sup>26</sup> <del>25</del>	Change to read after has an "inspection and" quality assurance...	AGREE. WILL REVISE
11.	R. Frias (PDCD)	01/25/85	2.1	SP-1	Add after schedule "including fabrication sequence when applicable."	AGREE. WILL ADD
12.	W. Robertson (PDCD)	01/25/85	N/A	SP-1	Page numbers are incorrect in table of contents.	WILL REVISE
13.	W. Robertson (PDCD)	01/25/85	N/A	SP-1	Change second page SP-1 to SP-2.	WILL REVISE
14.	W.J. Armento	01/25/85	7.0	SP-3	Could you be more specific as to point of delivery. Will it be a rail yard so that railroad delivery might be possible or will it be an open site area amenable to truck delivery?	AGREE. WILL REVISE TO INDICATE THAT DELIVERY LOCATION IS AMENABLE TO TRUCK DELIVERY
15.	W.J. Armento	01/25/85	1.0	GP-1	First paragraph refers to "equipment" two times and second paragraph refers to "equipment" once. Should change "equipment", to read "product".	AGREE. WILL CHANGE TO "PRODUCT"



NO.	REVIEWER	DATE	PARAGRAPH	PAGE	COMMENT	RESPONSE
16.	W.J. Armento	01/25/85	3.0	GP-1	For acronyms, abbreviations and definitions reference is made to Appendix A. But this contract book does not contain Appendix A.	WILL ADD APPA
17.	R. Frias (PDCD)	01/25/85	8.1	GP-3	Will District furnish all Risk Builders Risk Insurance?	CANT SAY. HOWEVER INSURANCE SPECIFICATION SHOULD COVER WHEN IT IS AVAILABLE
18.	R. Frias (PDCD)	01/25/85	10.1	GP-4	Should else-where in the contract be changed to "in Special Conditions" since G-P's take precedence over all but special conditions.	WILL CONSIDER. SP'S MIGHT BE BETTER. NOT NECESSARY TO CHANGE
19.	W.J. Armento	01/25/85	18.3	GP-13	Second paragraph, second line refers to "partially completed installations" this has the connotation of equipment installation which is not in this contract, nor is any installation of any sort involved. Should delete phrase.	NO. DOES NOT HURT TO LEAVE IN. IF THERE IS NONE, THERE IS NOTHING TO PAY FOR
20.	R. Frias (PDCD)	01/25/85	22.1	GP-15	Definition of equipment should be consistent in both construction and procurement contracts. In construction contracts the definition for materials includes equipment, in this clause the equipment definition includes materials.	NO REASON IT HAS TO BE CONSISTENT. NO CHANGE
21.	W.J. Armento	01/25/85	22.1	GP-15	"All equipment" should be changed to read "all bid items" or "products".	WILL CONSIDER. BELIEVE IT CAN WORK AS IT IS. NO CHANGE AT THIS TIME
22.	W.J. Armento	01/25/85	22.2, 22.3, 22.4	GP-16, GP-17	These three paragraphs make repeated reference to "equipment" and the use of this term is again questioned.	SAME AS NO. 21
23.	W.J. Armento	01/25/85	23.0	GP-17	First sentence reads: The District may provide equipment for installation or other use by the Contractor in carrying out his scope of work under this Contract.	THESE ARE <u>GENERAL</u> PROVISIONS. WE USE THEM FOR OTHER CONTRACTS. IT HURTS NOTHING TO HAVE THESE IN

<u>NO.</u>	<u>REVIEWER</u>	<u>DATE</u>	<u>PARAGRAPH</u>	<u>PAGE</u>	<u>COMMENT</u>	<u>RESPONSE</u>
23. (cont.)					<p>What kind of equipment would RTD be providing for production of Contact Rail?</p> <p>Contact rail contract is for procurement of rail segments and does not involve installation.</p> <p>The entire Section 3.0 with its subparagraphs A, B &amp; C does not appear to be valid.</p>	
24.	W.J. Armento	01/25/85	24.3	GP-18	<p>Packing - requires that "all shipments shall be packaged and packed .... to insure the integrity of equipment ...."</p> <p>a) Is it realistic to package and pack the 39' long contact rails</p> <p>b) This article may be true for sensitive equipment but not for the products involved.</p>	IT MENTIONS COMMERCIAL REQUIREMENTS WHATEVER THAT MAY BE. NO CHARGE
25.	W.J. Armento	01/25/85	24.3	GP-18	<p>The last sentence refers to "packaging requirements contained in the Technical Provisions --". But there are no such requirements given in the Technical Provisions. Is this evidence that none are needed?</p>	YES
26.	R. Frias (PDCD)	01/25/85	24.3	GP-18	<p>Suggest shipments be packaged and packed in accordance with manufacturer's standards or if the manufacturer does not specify any standards, then equipment should be packed and packaged in accordance with best commercial standards.</p>	COMMERCIAL STANDARDS ARE ALL THAT IS REQUIRED UNLESS TP'S CALL FOR MORE. HE CAN USE HIS STANDARDS IF HE WISHES BUT MUST BE AS GOOD OR BETTER THAN COMMERCIAL
27.	L. Boyden (RTD)	01/10/85	25.1	GP-18	<p>Title should not be deemed to have passed to the district until the materials, services and workmanship have been verified to meet the quality and safety standards of the district.</p>	TITLE PASSES WHEN PAYMENT IS MADE. SHOULD NOT PAY FOR ANYTHING. DISTRICT DOESNT WANT TITLE TO.

<u>NO.</u>	<u>REVIEWER</u>	<u>DATE</u>	<u>PARAGRAPH</u>	<u>PAGE</u>	<u>COMMENT</u>	<u>RESPONSE</u>
28.	W.J. Armento	01/25/85	32.1	GP-20	Technical Data - this entire section does not seem applicable to the products involved and how they are delivered. Especially inappropriate is subparagraph A calling for "any manuals or instructional materials prepared for installation, operation, maintenance or training purposes."	MAY NOT BE APPLICABLE BUT THESE ARE GENERAL PROVISIONS. - IF NA, DON'T APPLY THEM
29.	M. Ingram	01/28/85	35.6	GP-23	The referenced paragraph 31.1 through 31.6 appears to be in error. CORRECT.	AGREE. WILL BE CORRECTED
30.	E.V. Martinez (PDCD)	01/25/85	36.10	GP-28	Add the following organization to the list:  Women Construction Owners and Executives, USA P.O. Box 91464 Long Beach, California 90809	AGREE. WILL BE CORRECTED <i>only NA 11-21-88</i>
31.	E.V. Martinez (PDCD)	01/25/85	36.12	GP-30	Omit the work "capitalize" on the second line, after "Equal".	AGREE. WILL OMIT
32.	J.S. McKinley (PDCD)	01/25/85	37.1	GP-31	Question why this requirement is necessary on a fixed price contract with inspection and quality requirements.	THIS REQUIREMENT IS BEING CHANGED TO ELIMINATE MOST OF APPROVALS
33.	J.S. McKinley (PDCD)	01/25/85	37.2	GP-31	Reference to 33.1 should refer to 37.1.	AGREE. WILL CORRECT
34.	J.S. McKinley (PDCD)	01/25/85	48.0 thru 81.2	GP-36 thru GP-62	Suggest deletion of Sections 48.0 through 81.2 as this is a "material furnish" contract involving no on-site installation.	AGREE. IT SHOULD NOT BE IN THIS CONTRACT BOOK WILL BE REMOVED
35.	R. Prias (PDCD)	01/25/85	See Comment	GP-36 thru GP-59	Delete the clauses, i.e., 55, 57, 58, 61, 62, 63, 64, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, and 81, which apply to construction contracts and not to procurement/fabrication contracts.	AGREE. NA. WILL DELETE

<u>NO.</u>	<u>REVIEWER</u>	<u>DATE</u>	<u>PARAGRAPH</u>	<u>PAGE</u>	<u>COMMENT</u>	<u>RESPONSE</u>
36.	L. Boyden (RTD)	01/10/85	47.4	GP-36	CAL/OSHA recordkeeping requirements should be referred to in this paragraph. Personnel and baseline medical records are required to be kept in some cases for long periods of time.	SAME AS NO. 35 <i>ok 11-21-85 RJA</i>
37.	M. Ingram	01/28/85	55.0	GP-36	Third line - the Referenced General Provisions are wrong - should be (56.0 through 81.0) in lieu of (48.0 through 74.0).	SAME AS NO. 35 <i>ok 11-21-85 RJA</i>
38.	L. Boyden (RTD)	01/10/85	59.2	GP-38	This paragraph should also require some evidence indicating at least minimal capacity on the part of the contractor to hold the district harmless as evidenced by some instrument of bonding, insurance or a contingency fund.	SAME AS NO. 35 <i>ok 11-21-85 RJA</i>
39.	E.V. Martinez (PDCD)	01/25/85	67.1	GP-42	Add the word "age" to the first sentence.	SAME AS NO. 35
40.	W.J. Armento	01/25/85	44.1	GP-33	The heading is "rolling Stock (includes Train Control, Communications and Traction Power Equipment" and the first paragraph says "this procurement" which is assumed to refer to heading. Delete 44.1 or perhaps reuse heading.	IT IS SOMEWHAT CONFUSING, BUT THE ACTUAL CERTIFICATE SHOULD MAKE IT CLEAR. USED 44.1 AND 44.2 IN GENERAL
41.	W.J. Armento	01/25/85	44.2	GP-33	Refers to paragraph 43.1 but there is no 43.1 in these Specifications.	SHOULD BE 44.1 WILL REVISE
42.	W.J. Armento	01/25/85	44.2	GP-33	Bottom paragraph refers to "cement". Where does cement come into this contract?	IT WAS PART OF STANDARD CLAUSE. CEMENT IS NO LONGER INCLUDED
43.	W.J. Armento	01/25/85	58.1	GP-37	This section pertains to a construction contract affected by site conditions and certainly not applicable to the production of Contract Rail. Delete.	WOULD BE IN CONTRACT

<u>NO.</u>	<u>REVIEWER</u>	<u>DATE</u>	<u>PARAGRAPH</u>	<u>PAGE</u>	<u>COMMENT</u>	<u>RESPONSE</u>
44.	W.J. Armento	01/25/85	58.2	GP-38	This section likewise pertains to a construction contract and should be deleted.	THIS SECTION WILL BE DELETED
45.	W.J. Armento	01/25/85	61.0 61.6	GP-39 GP-40	Protection of existing vegetation, structures, etc. This entire section should be deleted. A construction contract specs, not for procurement.	SAME AS NO. 44
46.	W.J. Armento	01/25/85	62.0 to 65.2	GP-41 GP-42	The applicability of these sections to the contract rail procurement should be re-examined.	SAME AS NO. 44
47.	W.J. Armento	01/25/85	71.0	GP-59	Cooperation, access and community relations. The applicability of 71.1 thru 71.4 is questioned.	SAME AS NO. 44
48.	W.J. Armento	01/25/85	72.0	GP-59	How does this section pertain to A612?	SAME AS NO. 44
49.	W.J. Armento	01/25/85	73.1	GP-60	Is this section pertinent?	
50.	W.J. Armento	01/25/85	74.0	GP-60	This section certainly is not valid.	SAME AS NO. 44
51.	W.J. Armento	01/25/85	76.0	GP-60	Is this section valid?	
52.	W.J. Armento	01/25/85	79.0 thru 81.2	GP-79 thru GP-81.2	Should re-examine the validity of these provisions which are true for a site work construction contract but not for a delivery one.	SAME AS NO. 44
53.	K. Frias (PDCD)	01/25/85	2.2.1	2-1	Section 2.2.1 cites documents/codes which will apply to this contract to the extent cited in the technical provisions. Suggest welding requirements be covered in technical specifications to indicate what portions of AWS D1.1 will be required. Should also specify whether inspection is to require an inspector qualified to AWS QC-1.	AGREE. WILL INCORPORATE See TP 3-7.3.A RM 5.2.89

NO.	REVIEWER	DATE	PARAGRAPH	PAGE	COMMENT	RESPONSE
54.	M. Ingram	01/28/85	2.4	2-3	Delete this requirement here, as it is more logically and adequately covered in Section 7.	AGREE. WILL DELETE <i>duf 1/21/88</i>
55.	B. Hansson (RTD)	01/25/85	3.2.1	3-1	Add after "C": "D. Voltage and current" "proof of service life shall be submitted with the bid. This data shall consist of actual measurements from the same type rail as proposed, and under the same transit system, operating conditions, and shall project the expected wear life of the rail."	DISAGREE. ANY DATA TO BE FURNISHED BY THE BIDDER ON THE SUBJECT WILL HAVE TOO MANY VARIABLES TO ALLOW ACCURATE EVALUATION. WARRANTY REQUIREMENT (15 YEARS AS SPECIFIED) WILL ALLOW PROTECTION AGAINST REDUCED LIFE
56.	R. Lontok (PDCD)	01/25/85	3.2.1.B	3-1	Indicate current density per square inch of the shoe contact surface. Requirement is not clear, it maybe interpreted to equal the capacity of the rail which is excessive.	DISAGREE. OK AS IS
57.	W.J. Armento	01/25/85	3.2.2	3-1	The temperature scale in this section is cited at °C (Celsius) whereas in other sections the scale is °F (Fahrenheit). Suggest you give both scales, side by side, to avoid confusion and to simplify relationships of temperature requirements.	AGREE. WILL REVISE
58.	P. Bakas	01/29/85	3.1 3.2.1	3-1	- Add side approach assemblies in paragraph 3.1 - is there a wear condition which determines end of useful service life? If so, add to paragraph 3.2.1.	WILL ADD END OF USEFUL SERVICE LIFE CONDITION
59.	W.J. Armento	01/25/85	3.2.2.A 3.2.2.B	3-1 3-2	Which Contact Rail type is for mainline? Which Contact Rail type is for Yard? Nowhere in these Specifications do you say where Type 1 and Type 11 will be used.	THIS IS PROCUREMENT SPECS. WILL BE IDENTIFIED IN TRACKWORK INSTALLATION CONTRACT A610

NO.	REVIEWER	DATE	PARAGRAPH	PAGE	COMMENT	RESPONSE
60.	W.J. Armento	01/25/85	3.2.3 3.3.1.B 3.4.1 3.9 3.16.6 H & J	3-2 3-3 3-4 3-7 3-12	Recites temperature in °C Gives temperature in °F Uses temperature in °C Indicates temperature in °F Show temperature in °C	See Reference No. 58 above SAME AS NO. 58
61.	P. Bakas	01/29/85	3.3.1	3-2	85 ASCE is no longer included in AREA manual. Also, the No. 1 surface classification has been dropped. New 85 ASCE rail may be difficult to find, can an alternate such as 90 AKA be used?	WILL INVESTIGATE
62.	W. Robertson (PDCD)	01/25/85	3.2.3	3-2	For main line contact rail, the 4000 ADC minimum current rating is not in agreement with Criteria paragraph 4.6.A on page V-4-11 which specifies 6000 ADC.	AGREE. WILL CHANGE CRITERIA
63.	W. Robertson (PDCD)	01/25/85	3.2.3	3-2	Likewise for yard contact rail it is 2000 ADC vs. 3000 ADC in Criteria.	AGREE. WILL CHANGE CRITERIA
64.	R. Lontok (PDCD)	01/25/85	3.3 3.9	3-2 3-7	Is there any requirement for pre-formed curved contact rail sections?	NOT IN PROCUREMENT SPECS. WILL BE INCLUDED IN TRACKWORK INSTALLATION CONTRACT A G I O
65.	P. Bakas	01/29/85	3.3 3.6 P-152	3-3	The referenced sections do not discuss protective coverboard and support brackets in Dip Sections. With a 5'-0" support bracket spacing at least one support bracket will be on the Dip Section incline which is 9'-0" in length. Is this a special bracket? Likewise, the change from 14-1/2 - 16-1/4 in end approaches, does this apply to dip section?	AGREE. WILL PROVIDE SPECIAL BRACKET AT 9'-0 RAMP S
66.	T.W. Cook	02/05/85	3.3.1.B	3-3	Using °F on spec's. for rail where other locations in spec. (3.2.3) you use °C. Should be consistent in spec's.	SAME AS NO. 58

<u>NO.</u>	<u>REVIEWER</u>	<u>DATE</u>	<u>PARAGRAPH</u>	<u>PAGE</u>	<u>COMMENT</u>	<u>RESPONSE</u>
67.	T.W. Cook	02/05/85	3.3.3	3-3	Lock bolt system with bolts, nuts, and washers are very different from the "Huck" fastener. One requires torque requirements, the other is machine tool set for collar squeeze, etc. This all should be clarified.	WILL INVESTIGATE
68.	P. Bakas	01/29/85	3.4.3	3-5	Mark contact rail "yard" and "mainline" to segregate for installation.	AGREE. WILL TAG INDICATING 0.002 AND 0.004
69.	B. Hansson (RTD)	01/25/85	3.4.2.F	3-5	The finish of the contact surface shall free from twists, waves and kinks.	AGREE. WILL ADD
70.	P. Bakas	01/29/85	3.14	3-8	Add side approach assemblies section to include Contact Rail Type I.	AGREE. WILL ADD
71.	B. Hansson (RTD)	01/25/85	3.15.1.D 3.16.6	3-9 3-11	Ultraviolet stabilizer in material is preferred over coating, but do not need both.	AGREE. WILL DELETE COATING
72.	W.J. Armento	01/25/85	3.15.1.0	3-9	What does (CDRL) mean? It is used quite frequently in these Specifications, but with absence of abbreviation list cannot make it out.	ABBREVIATION IS DEFINED IN SECTION 9 PAR. 9.2
73.	R. Lontok (PDCD)	01/25/85	3.15.1	3-9	Specify minimum tensile strength of strain insulator.	AGREE. WILL ADD "MINIMUM" AFTER ULTIMATE TENSILE STRENGTH.
74.	D.R. Fiedler (J. Yen)	01/09/85	3.16.6.J 3.16.6.K	3-12	For consistency, ASTM E-162 is of 15 or less should be used.	COMMENT NOT CLEAR. WILL DISCUSS WITH REVIEWER.
75.	P. Bakas	01/29/85	4.2	4-1	"Qualifaction" --- "Qualification"	COMMENT NOT CLEAR. "QUALIFICATION" IS USED
76.	B. Hansson (RTD)	01/25/85	4.3	4-1	14 days seems short considering that travel authorization has to be processed. Suggest not less than 30 days.	WILL INVESTIGATE



NO.	REVIEWER	DATE	PARAGRAPH	PAGE	COMMENT	RESPONSE
77.	M. Ingram	01/28/85	4.3	4-1	"14 days" should be changed to "10 days", to provide consistency with GP Article 24.1 and the district agreed to time frame of 10 days used in similar section of the QA spec. requirements developed for use in the major systems procurement contracts.	WILL INVESTIGATE 11-21-98
78.	M. Ingram	01/28/85	4.4	4-1	2nd sentence - Calibration certificates for test equipment should be submitted with test reports. The nature of specific test equipment may require a calibration frequency more stringent than 60 days, in which case this submittal requirement would result in out-of-date certificates.	AGREE. WILL REVISE 11-21-98
79.	E. Leard	01/23/85	4.2C 4.8	4-1 4-5	Delete these paragraphs - Special Testing should not be required	AGREE. WILL DELETE
80.	R. Lontok (PDCD)	01/25/85	4.6.1.A.2	4-2	Cable connection to the contact rail should be identical to the cable connection to be made in the field.	DISAGREE. CABLE CONNECTION IS IRRELEVANT TO THE TEST
81.	M. Ingram	01/28/85	4.5.1	4-2	60-day submittal requirement for Test Program Plan does not agree with Table 9.1, column (e) which states 45 days.	AGREE. WILL REVISE TABLE 9.1 11-21-98
82.	M. Ingram	01/28/85	4.5.1	4-2	3rd sentence - Delete comma between "procedure" and "submittal".	AGREE. WILL DELETE COMMA 11-21-98
83.	M. Ingram	01/28/85	4.5.3	4-2	The information to be included in test reports must be expanded to include:	AGREE. WILL INCLUDE

- ✓ Test Procedure Reference
- ✓ Test Equipment Identification
- ✓ Test Personnel
- ✓ Date of Test
- ✓ Specified Requirements
- ✓ Actual Test Results
- ✓ Nonconformances, if any

11-21-98

NO.	REVIEWER	DATE	PARAGRAPH	PAGE	COMMENT	RESPONSE
84.	R. Lontok (PDCD)	01/25/85	4.6.1.D	4-3	Indicate all allowable heat rise for the contact rail and joint, see requirement of paragraph 3.2.3.	AGREE. WILL ADD "HEAT RISE SHALL NOT EXCEED THE SPECIFIED"
85.	P. Bakas	01/29/85	4.6.1.C.5	4-3	"Unjoined rail" --- "Unjointed rail"	AGREE. WILL REVISE
86.	W.J. Armento	01/25/85	4.6.1.A.7 4.6.1.C.3 4.6.1.D.5 4.6.3.C	4-3 4-4	Use °C Use °C	SAME AS NO. 58
87.	M. Ingram	01/28/85	4.6.3.B	4-4	2nd sentence - indicate the height from which the 50# weight is to be dropped.	AGREE. WILL INDICATE <i>OK MA 11-21-88</i>
88.	B. Hansson (RTD)	01/25/85	4.6.1.E	4-4	Allow to certify by tests. Calculations (or test) should be with rail installed per these specifications.	AGREE. WILL REVISE
89.	M. Ingram	01/28/85	4.7.A	4-5	Add the appropriate words to indicate that the specified production tests are to be performed using the approved Qualification Test Procedure.	AGREE. WILL ADD <i>OK MA 11-21-88</i>
90.	B. Hansson (RTD)	01/25/85	4.8	4-5	Last sentence; replace "either" with "with any of".	PARAGRAPH WILL BE DELETED. SEE NO. 79
91.	M. Ingram	01/28/85	4.7	4-5	This section should also include increased sampling/testing frequency to be utilized in case of a test failure. Reference Section 4.7 of the Coverboard Spec. for example of what I'm talking about.	AGREE. WILL ADD <i>OK MA 11-21-88</i>
92.	M. Ingram	01/28/85	4.7.A.1 4.7.A.2	4-5	Revise to read in part "... from every 500 section <u>or fraction</u> , ....".	AGREE. WILL REVISE <i>OK MA 11-21-88</i>
93.	M. Ingram	01/28/85	4.7	4-5	Please give consideration to the following QC Testing for Type I Contact Rail. Testing of tensioning (torque) of the A325 bolts which clamp the extended aluminum bars to the web of the steel rail. Performance of such a test at a	WILL INVESTIGATE Patented "Huckbolt" pneumatic tightener makes permanent assembly to pre- determined torque level. <i>5/100 PPD</i>

NO.	REVIEWER	DATE	PARAGRAPH	PAGE	COMMENT	RESPONSE
93. (cont.)					assurance, in conjunction with the specified dc resistance test, that specified performance requirements are achieved.	
94.	M. Ingram	01/28/85	5.1	5-1	<p>The Quality Assurance Program should also address the following, in addition to A-D:</p> <ul style="list-style-type: none"> <li>◦ Identification, control and disposition of nonconformances</li> <li>✓ Item Identification</li> <li>◦ Identification of Inspection Status</li> <li>◦ Calibration of Measuring and Test Equipment</li> <li>◦ Organization, Authority and Responsibility</li> <li>✓ Certification of Personnel Performing Special Processes</li> <li>◦ Control of Special Processes</li> <li>◦ Drawing and Change Control</li> </ul>	<p>AGREE. WILL INCORPORATE</p> <p>The Quality Assurance Program Plan CORL-8 which requires approval must address these items  RA  5.2-89</p>
95.	R. Frias (PDCD)	01/25/85	Sect. 5	5-1	<p>Suggest: The <u>Contractor's</u> currently approved QA or QC Manual and the program meeting, as a minimum, the requirements of this section be submitted for approval.</p>	<p>DISAGREE. A WRITTEN PROGRAM AS SPECIFIED, DOES NOT PRECLUDE SUBMITTAL OF QA OR QC MANUAL</p>
96.	W.E. Price	01/07/85	Sect. 7	7-1	<p>Paragraph 7.2 - A statement should be included which requires substantiation of the components listed E.G. "Each component on the list shall be verified by its usage rate, replenishment lead time, and estimated unit price."</p>	<p>AGREE. WILL INCORPORATE</p>
97.	E. Leard (RKE- Oakland)	01/23/85	7.2	7-1	<p>Revise first sentence to read ".... item description and manufacturer's name and part number ...."</p>	<p>AGREE. WILL INCORPORATE</p>

<u>NO.</u>	<u>REVIEWER</u>	<u>DATE</u>	<u>PARAGRAPH</u>	<u>PAGE</u>	<u>COMMENT</u>	<u>RESPONSE</u>
98.	W.J. Armento	01/25/85	7.2	7-1	Spare parts listing - there is no bid item for spare parts nor is there any description of the spare parts required. Clarify!	SPARE PARTS ARE NOT PROCURED NOW. LIST IS NEEDED FOR FUTURE USE
99.	W.J. Armento	01/25/85	9.1	9-1	Why is GENERAL AND SPECIAL PROVISIONS in capital letters while Technical Provisions is in ordinary lower case? Under any circumstances "AND" should be "and".	WILL CORRELATE
100.	M. Ingram	01/28/85	9.1	9-1	Last line - delete "below".	<i>OK 11-21-88</i> AGREE. WILL DELETE
101.	M. Ingram	01/28/85	9.2	9-2	Correct typo - "Table 7.1" should be "Table 9.1".	<i>OK 11-21-88</i> AGREE. WILL CORRECT
102.	M. Ingram	01/28/85	Table 9.1	9-7	Item 01 - Ref. para. should be 7.1 - See No. 11. Item 02 - Ref. para. should be 3.15.1D Item 03 - Ref. para. should be 3.16.6 Item 04 - Ref. para. should be 4.5.1 Item 04 - Column (e) - See comment #81 Item 05 - Ref. para. should be 4.5.3 Item 08 - Ref. para. should be 6.2.3 Item 09 - Ref. para. should be 6.3.1  Add the following CDRL items to Table 9.1  Test Equip. Calib. Certs. - para. 4.4 Test Procedures - para. 4.5.2 Qualification Test Cert. - para. 4.5.4 Spare Parts List - para. 7.2.	AGREE. WILL CORRECT  <i>OK 11-21-88</i>
103.	W. Robertson (PDCD)	01/25/85	Table 9-1	9-2	Item 01 - Indicates "no approval" which is in conflict with para. 7.1 on page 7-1.	AGREE. WILL CORRECT
104.	W. Robertson (PDCD)	01/25/85	Table 9-1	9-2	Item 02 - Ref. para. 3.14.1D should be 3.15.1.	AGREE. WILL CORRECT
105.	W. Robertson (PDCD)	01/25/85	Table 9-1	9-2	Item 03 - Ref. para. 3.15.6 should be 3.16.6.	AGREE. WILL CORRECT





# MEMORANDUM

REVIEW COMMENTS TRANSMITTAL

RECEIVED BY MRTC

DATE: JUNE 14, 1985

JUN 17 1985

TO: I. SHAFIR

SYSTEMS DESIGN DIVISION

FROM: TOM TANKE / Tom

SUBJECT: A-612, 615, 630 TRACTION POWER PROCUREMENT CONTRACT  
100% DESIGN REVIEW

FILE NO: 3400 x 082

In response to your memo of MAY 17, 85 (date) regarding the subject mentioned above, attached are review comments by SAFETY  
ASSURANCE & SECURITY.

If you have any questions, please contact \_\_\_\_\_ (name).

### Attachments

cc:	(w/attachment)	(w/o attachment)
	K. Rummel	
	T. Cook/Dr File	
	DCC	DCC
	J. SANDBERG	Chron
	R. WOOD.	Subject
		File

Cross Reference  
Section II  
Design Review  
Comments  
5-7-85  
6-13-85  
6-2-85





FLSC 85-5-158/159  
CRIT 85-15

FIRE/LIFE SAFETY  
COMMITTEE

RECEIVED  
SCRTD - TSD  
SYSTEMS DESIGN & ANALYSIS  
JUN 24 1985  
8 58

June 18, 1985

Mr. William R. Rhine, Director  
Systems Design & Analysis Dept.  
Southern California Rapid  
Transit District  
425 South Main Street  
Los Angeles, CA 90013

ITEM # \_\_\_\_\_  
FILE # \_\_\_\_\_

Dear Mr. Rhine:

A-612, 615, 630 - Traction Power - Final Design

On May 30, 1985, the Fire/Life Safety Committee (FLSC) received a transmittal from MRTC requesting review of A-612, 615, 630 - Traction Power, Final Design review, dated May 17, 1985.

After review of the above titled documents, the Fire/Life Safety Committee agrees with the proposals and have no adverse comments at this time.

Should you have any questions regarding this matter, please contact the FLSC at 972-3457.

Very truly yours,

Donald E. Bartlett  
Donald E. Bartlett, Battalion Chief  
Los Angeles City Fire Department

Richard B. Schiehl  
Richard B. Schiehl, Battalion Chief  
Los Angeles County Fire Department

Roger W. Wood  
Roger W. Wood, Jr.  
SCRTD, Metro Rail

SCRTD. LIBRARY

cc: Mr. Robert Murray  
Mr. James Crawley  
SCRTD, FLSC Permanent Members







Cross Reference  
Section II  
Design Review  
Comments  
6-2-85  
6-13-85  
6-13-85  
5-7-85

# MEMORANDUM

July 12 1985

RECEIVED BY MRIC

JUL 12 1985

SYSTEMS INTEGRATION

TO : SEE DISTRIBUTION

FROM : I. Shafir

*Isaac Shafir*

SUBJECT : RESPONSES ON FINAL REVIEW COMMENTS -- TRACTION POWER  
PROCUREMENT CONTRACTS A612, A615, A630

FILE : W550A630  
P.6.1

Distribution:

L. Anderson, SCRTD  
D. A. Gary, SCRTD  
B. Hansson, SCRTD  
J. Loo, SCRTD  
W. J. Armento  
J. Beeson  
P. M. Burgess  
A. M. Dale  
D. R. Fiedler  
R. Hanlon

M. Ingram  
J. Misrahi  
G. W. Penney  
T. Tanke  
J. Yen  
J. V. Harmon, PDCD  
R. Frias, PDCD  
R. Lontok, PDCD  
W. Preece, PDCD  
W. Robertson, PDCD

RESPONSES  
ACCEPTABLE.  
MI  
7-16-85

Transmitted herewith are our responses on the subject comments. We plan to mark a set of each contract document so as to show the proposed modifications. These modifications, as well as the subject responses, need to be discussed with the reviewers.

The following times are being proposed for the above discussions:

July 18, 1985 -- 9:00AM, SCRTD & PDCD  
1:30PM, MRTC

Please let me know in advance if there is a conflict with your schedule.

IS/llm  
attachment

cc: DCC(2)



RECEIVED BY MRTC

MAR 01 1988

MEMORANDUM

SYSTEMS DESIGN DIVISION SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
TRANSIT SYSTEMS DEVELOPMENT  
RAIL FACILITIES

cc Bar  
Me  
Nick  
Tom  
Malcolm  
Let me know if you hear RTD wanting action from us on this issue  
AL

RECEIVED

FEB 27 1988

DATE: February 22, 1988 File: X019.U  
TO: Joel Sandberg  
FROM: Michael F. Merrick  
SUBJECT: Positive-to-Ground Faults

WQA

*Michael F. Merrick*

\*\*\*\*\*

The problem of detecting traction power system positive-to-ground faults was discussed during detailed design. A positive short circuit having some resistance may go undetected where the fault current rate of rise is insufficient to trip the breakers. Because of the ungrounded negative return, the only indication of such faults is a steady potential difference between running rails and ground. Eventually, this voltage would be noticed on the strip-chart voltage recordings from the TPSS recorders (inspection frequency not known).

This situation creates a safety hazard. A maintenance worker may ground the track with a tool and cause an arc. This may startle him (adjacent to third rail) or cause damage to equipment.

- o Hole burned in train - WMATA.
- o Possible cause of damage to train control equipment - MARTA.
- o At some level, the voltage is noticeable to patrons boarding trains.

The Toronto Transit Commission has developed and installed a device on its ungrounded trackway which, at a pre-selected trackway voltage, sends an alarm to central control and automatically grounds the trackway. The MRTC Corrosion Consultant is familiar with details of this device. In view of its availability and the high level of trackway electrical isolation that we anticipate due to dry tunnels, further consideration might be given to the installation of a comparable alarm system on Metro Rail

cc: J. Crawley  
B. Hanson  
K. Murthy  
H. Storey

*Copy. A dealer  
9-10-88  
This is not in Canada  
at this time. If RTD  
elect to go this  
date to he need  
to either it. CRIC  
File: CC  
2/27*



M E M O R A N D U M

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
TRANSIT SYSTEMS DEVELOPMENT DEPARTMENT  
SYSTEMS DESIGN AND ANALYSIS

RECEIVED

APR 19 1988

\*\*\*\*\*  
\*\*\*\*\*

DATE: April 18, 1988  
TO: Michael F. Merrick  
FROM: *Joel J. Sandberg*  
SUBJECT: Positive-to-Ground Faults  
REFERENCE: Your Memorandum of 2/22/88

\*\*\*\*\*  
\*\*\*\*\*

During the final design of the traction power system, we reviewed the availability of equipment to automatically ground the negative return system when the track-to-earth potential exceeds 80 volts. We found no such equipment operating in North America, although the Toronto Transit Commission (TTC) was soliciting proposals. Vendors for traction power equipment expressed unwillingness to develop, furnish and accept liability for such a device and strongly urged us to not include it in our contracts. There were concerns about arbitrarily shorting the negative system to ground when there is a simultaneous positive-to-ground fault. We are instead providing an alarm at Central Control, when the track-to-earth potential is excessive, so that action can be taken to locate and correct the cause of the excessive voltage.

TTC has now apparently successfully developed and installed a solid state device to automatically ground the negative system. To this date, there is no transit system in the U.S. that has also done so. The TTC device is rather inexpensive and could be installed in MOS-1 for less than \$30,000. Space and other provisions have been included in the traction power substations, however, there may be some patent problems to be worked out.

We will continue to check on the availability of the device and plan to include it prior to MOS-1 revenue operation.

Attachment

- cc: W. Rhine
- M. Burgess-MRTC
- A. Dale-MRTC
- B. Hansson
- K. Murthy-MRTC
- G. Penney-MRTC
- H. Storey



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JUL 22 1988

SAFETY & ASSURANCE

M E M O R A N D U M

88-03266

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SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
TRANSIT SYSTEMS DEVELOPMENT DEPARTMENT  
SYSTEMS DESIGN AND ANALYSIS

\*\*\*\*\*

DATE: July 19, 1988  
TO: E. B. Pollan  
FROM: T. E. Frawley *Tom Frawley*  
SUBJECT: CCB Action Item 667 and O&M Committee Action Item  
24.3, Safety Concerns Re: 3rd Rail Reenergization

\*\*\*\*\*

A meeting of the working group assigned to complete this Action Item was held on Thursday, April 28. Attendees were: Hal Storey, Bo Hansson, Tom Eng and myself. Neil Johnson, who had also volunteered to participate, was unable to attend, but did review, and provide input to, this memo. Les Durrant who was not a member of the working group, subsequently volunteered to review the memo and did provide input thereto.

During the meeting three different interpretations of the issue were identified. Although one interpretation was ultimately agreed to be the one originally intended for consideration, all three interpretations are addressed in this memo to prevent future misunderstanding.

Interpretation I

It was concluded that the original intent of the action item was to consider what if any steps should be taken to prevent accidental electrocution from occurring by touching a contact rail section which is thought to be deenergized because the emergency deenergization switch has been activated but which is being reenergized by a train elsewhere in the section operating in regenerative braking mode. The vehicle specification originally called for a device which would detect contact rail deenergization and prevent the vehicle in regenerative braking mode from reenergizing the contact rail. The deletion of this requirement at the behest of the suppliers caused Hal Storey to raise the issue of a possible resultant safety hazard in his memo to Joel Sandberg of March 4, 1988, copy attached.

The scenario illustrated in Exhibit 1, attached, details the nature of the possible hazard. Train X leaves platform A on Track 1. Shortly thereafter, a person on platform A falls into or otherwise enters upon the trackway B. Meanwhile, train X has



begun braking in anticipation of a stop at platform D, and is in regenerative braking mode. Back on platform A, someone having observed the previously mentioned person in the trackway, then has the presence of mind to go to the end of the platform and to deenergize the contact rail in section C by operating the emergency deenergization switch. This person, possibly with assistance from others, might then enter the trackway and attempt to rescue the fallen person, or take other action, proceeding on the assumption that there is now no danger of electrocution from the contact rail. However, because train X had entered braking mode prior to the emergency deenergization, regenerative braking would have reenergized the contact rail and created a danger of accidental electrocution if someone were to touch the contact rail that was thought to be deenergized.

The working group considered this scenario and because the time spent in regenerative braking is a relatively small portion of the time a train requires to travel between stations, concluded that the probability of the emergency deenergization switch being thrown while there was a train in the given contact rail section and while that train was in regenerative braking mode, was very small. Note that if the deenergization took place prior to the train entering braking mode, regenerative braking would not be possible (only mechanical brakes would be available) and there would be no danger of reenergization. Further, when combined with the probability of persons taking the actions described, the probability of the entire scenario taking place is negligible. Since it was also concluded that nothing could be done to completely preclude the possibility of accidental electrocution of the rescuer or other person's in the trackway in such a scenario, no action is recommended beyond the posting of an appropriate sign adjacent to the emergency deenergization switch. This sign should warn of the possibility of unapparent reenergization of the contact rail, to reduce the likelihood of accidental electrocution.

### Interpretation II

An unintended interpretation of the action item is the consideration of the hazard present in the case of maintenance personnel working in and around the contact rail while it is deenergized. The working group agreed that procedures must be developed which ensure that a given section actually is, and remains, deenergized during such maintenance. As a preliminary step in developing such procedures, Tom Eng surveyed maintenance personnel at BART, WMATA and MTA (Baltimore) to determine the steps taken by them for this purpose. The working group used this survey information to draft the procedure outline shown on Exhibit 2.

Interpretation III

The third issue of concern is regarding dangerously high voltage in the running rails. As detailed in Memoranda from M. Merrick to J. Sandberg dated 2/22/88 and from J. Sandberg to M. Merrick dated 5/18/88, copies attached, Metro Rail will provide an alarm at the RCC to warn when track-to-earth potential is excessive.

Conclusion

Regarding Interpretation I, and in response to CCB Action Item 667, and O&M Committee Action Item 24.3, the working group has concluded that with the possible exception of a warning sign to be posted at the emergency deenergization switch, no further action is necessary and the group recommends that no further action be taken.

Regarding Interpretation II, when the appropriate time comes, the draft procedure outline produced as a result of the working group's survey and discussion should serve as the starting point for developing procedures to be used for maintenance related contact rail deenergization.

Regarding Interpretation III, the working group is satisfied with the previous resolution described above.

cc:

L. Durrant  
T. Eng - MRTC  
B. Hanson  
B. Hansson  
N. Johnson - PDCD  
J. Sandberg  
H. Storey

MEMORANDUM

SOUTHERN CALIFORNIA RAPID TRANSIT SYSTEMS DEVELOPMENT SYSTEMS AND CONSTRUCTION

\*\*\*\*\*

DATE: March 4, 1988
TO: Joel J. Sandberg
FROM: Harold E. Storey
SUBJECT: Passenger Vehicle Design Criteria, Volume V, Section 1

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With approval of Change Request 8-008 concerning a change to criteria section 1.9.3 "Dynamic Braking and Regeneration," by which the section's second paragraph requirement that "No component or device on the car shall return any power....or cause the power collector devices to be at a potential above zero....." was deleted, a new operating procedure will now have to be developed to protect employees working in the track area.

Please note this requirement and inform the O&M Committee that an operations/maintenance procedure must be developed by which employees are protected against the potential of a de-energized track/third rail becoming energized. Attached for your information is a copy of the SCS Department's Change Technical Evaluation and Notice-of-Action noting the above requirement.

Attachment

cc: W. Rhine
B. Bandy
F/LSC

Ed, (IEF plus do)
Please prepare a brief response memo to HES assuring him the necessary procedures will be developed and ~~status~~ outlining the process for doing so.
JD

Called Hal 3-23-88 ... w/c

Spoke 3-30-88:

Have in O&M Com - (Bill Cannon B.)
need procedure to protect from accidents
energized track in vicinity of a negotiation.

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SYSTEMS DESIGN & ANALYSIS

MAR 04 1988

ITEM # 326
FILE #

Memo sent to Storey 4/4/88 inviting him to lead discussion of issue at O&M Committee Meeting of 4/7/88.



# Working Notes

Subtask	EXHIBIT 1	Date	12/11/84	Page	1	of	3
Subject	...	Preparer	TJE				

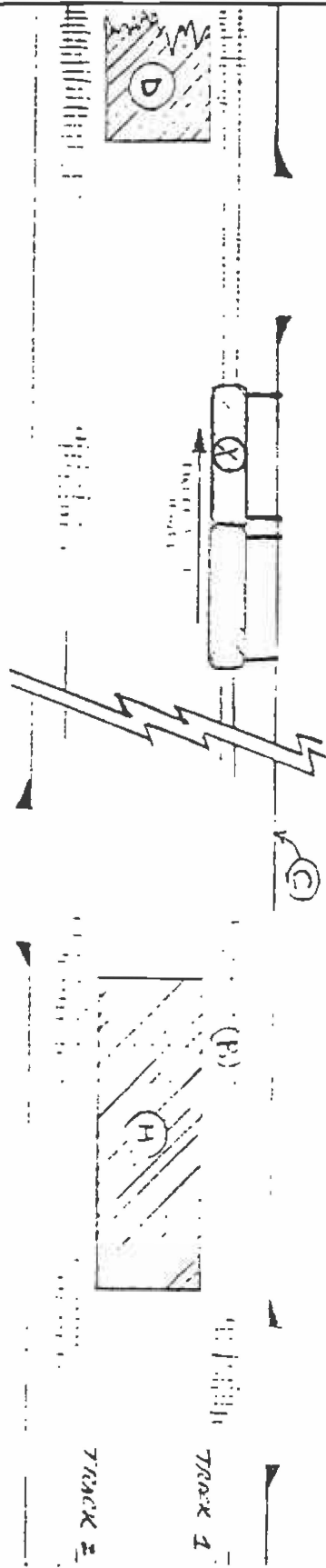


EXHIBIT 2

DRAFT OUTLINE OF CONTACT RAIL  
DEENERGIZATION/REENERGIZATION

SAFETY PROCEDURES

1. Contact RCC and request that the route be blocked and section be deenergized.
2. Confirm by radio that the last train to pass through the section to be deenergized has berthed at the next station platform. (i.e., it is in the next contact rail section.)
3. Pull substation breaker.
4. Apply grounding device between wet standpipe and contact rail. (Typical procedures of grounding the contact rail to a running rail may be unsatisfactory, since MRT running rails are isolated.)
5. If 3rd rail is to be separated, apply second grounding device on other side of break.
6. When repairs are complete, remove the grounding device(s).
7. Reset substation breaker.
8. Contact RCC to reenergize contact rail and open route.

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SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
TRANSIT SYSTEMS DEVELOPMENT  
RAIL FACILITIES

\*\*\*\*\*  
 DATE: February 22, 1988 File: X019  
 TO: Joel Sandberg  
 FROM: Michael F. Merrick *M. Merrick* FEB 23 1988  
 SUBJECT: Positive-to-Ground Faults ITEM # 263  
 FILE # \_\_\_\_\_

\*\*\*\*\*

The problem of detecting traction power system positive-to-ground faults was discussed during detailed design. A positive short circuit having some resistance may go undetected where the fault current rate of rise is insufficient to trip the breakers. Because of the ungrounded negative return, the only indication of such faults is a steady potential difference between running rails and ground. Eventually, this voltage would be noticed on the strip-chart voltage recordings from the TPSS recorders (inspection frequency not known).

This situation creates a safety hazard. A maintenance worker may ground the track with a tool and cause an arc. This may startle him (adjacent to third rail) or cause damage to equipment.

- o Hole burned in train - WMATA.
- o Possible cause of damage to train control equipment - MARTA.
- o At some level, the voltage is noticeable to patrons boarding trains.

The Toronto Transit Commission has developed and installed a device on its ungrounded trackway which, at a pre-selected trackway voltage, sends an alarm to central control and automatically grounds the trackway. The MRTC Corrosion Consultant is familiar with details of this device. In view of its availability and the high level of trackway electrical isolation that we anticipate due to dry tunnels, further consideration might be given to the installation of a comparable alarm system on Metro Rail

cc: J. Crawley  
B. Hanson  
K. Murthy  
H. Storey

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CONTROL

Tom FRAWLEY

M E M O R A N D U M

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
TRANSIT SYSTEMS DEVELOPMENT DEPARTMENT  
SYSTEMS DESIGN AND ANALYSIS

\*\*\*\*\*

DATE: April 18, 1988  
TO: Michael F. Merrick  
FROM: *Joel J. Sandberg*  
SUBJECT: Positive-to-Ground Faults  
REFERENCE: Your Memorandum of 2/22/88

\*\*\*\*\*

During the final design of the traction power system, we reviewed the availability of equipment to automatically ground the negative return system when the track-to-earth potential exceeds 80 volts. We found no such equipment operating in North America, although the Toronto Transit Commission (TTC) was soliciting proposals. Vendors for traction power equipment expressed unwillingness to develop, furnish and accept liability for such a device and strongly urged us to not include it in our contracts. There were concerns about arbitrarily shorting the negative system to ground when there is a simultaneous positive-to-ground fault. We are instead providing an alarm at Central Control, when the track-to-earth potential is excessive, so that action can be taken to locate and correct the cause of the excessive voltage.

TTC has now apparently successfully developed and installed a solid state device to automatically ground the negative system. To this date, there is no transit system in the U.S. that has also done so. The TTC device is rather inexpensive and could be installed in MOS-1 for less than \$30,000. Space and other provisions have been included in the traction power substations, however, there may be some patent problems to be worked out.

We will continue to check on the availability of the device and plan to include it prior to MOS-1 revenue operation.

Attachment

- cc: W. Rhine
- M. Burgess-MRTC
- A. Dale-MRTC
- B. Hansson
- K. Murthy-MRTC
- G. Penney-MRTC
- H. Storey