

TASK ORDER NO. 23-005

TASK ORDER NAME: Brake Cut-Out Valve

PROJECT CODE: SGR-403

This is Task Order #23-005 to the On-Call Maintenance Contract entered into by and between Utah Transit Authority (UTA) and Rocky Mountain Systems Services, (Contractor) as of February 24th, 2021.

This Task Order is part of the On-Call Maintenance Contract and is governed by the terms thereof.

The purpose of this Task Order is to specifically define the scope, schedule, lump sum price, and other terms applicable to the work identified herein.

UTA and Contractor hereby agree as follows:

1.0 SCOPE OF SERVICES

The scope of work for the Task Order #23-005 is hereby attached and incorporated into this Task Order.

2.0 SCHEDULE

The Substantial Completion Date for this Task is February 28, 2024. The Final Acceptance Date for this Task is October 31, 2024.

3.0 LUMP SUM PRICE

The price for this task order is a not to exceed \$1,419,326. Invoices will be billed on monthly basis for work completed to date.

4.0 APPLICABILITY OF FEDERAL CLAUSES

Task Order #23-005 is anticipated to receive federal assistance funds, which requires the application of the Federal Clauses appended as Exhibit D to the On-Call Maintenance Contract. The UTA Civil Rights group has set a Disadvantaged Business Enterprises (DBE) participation goal of Race Neutral for this Task Order. The contractor will submit any applicable DBE participation forms at completion of this Task Order.

IN WITNESS WHEREOF, this Task Order has been executed by UTA and the Contractor or its appointed representative

UTAH TRANSIT AUTHORITY:

INSERT CONTRACTOR NAME:

By: _____
Jay Fox, Executive Director Date
> \$200,000

DocuSigned by:
By: Dan Meservey
EEBD0B44A1004CA...

By: _____
Mary DeLoretto, Chief Service Development Ofc. Date
< 200,000

Date: 4/21/2023

By: _____
Jared Scarbrough, Director of Capital Construction Date
< \$75,000

By: _____
Dean Hansen, Project Manager Date
< \$25,000

DocuSigned by:
Mike Bell 4/21/2023
Legal Review Date
70E33A415BA44F6...

Procurement Review Date



March 13th, 2023

RMSS-52598-069

Mr. Dean Hansen
Manager of Systems Engineering
2264 South 900 West
Salt Lake City, UT 84119

Reference: Utah Transit Authority – Systems On-Call Services

Subject: Pilot Brake Cutout Bypass Mitigation

Dean,

Rocky Mountain Systems Services (RMSS) is pleased to provide a proposal for onboard and back-office upgrades that are required for the mitigation of a potential safety hazard as identified by the FRA in the *"Safety Advisory 2021-01 – Positive Train Control Interface Design Issue with Locomotive and Cab Car Braking Systems"*. The Safety Advisory details an identified interface design issue that allows a train crewmember to circumvent a Positive Train Control (PTC) enforcement by manually cutting out the pilot valve/brake stand, prior to the PTC system initiating the brakes. Due to this Safety Advisory, RMSS has been tasked with assisting UTA in developing and implementing a mitigation strategy for this issue.

Our lump sum price for the base scope of this proposal is **\$1,122,046.00**

The base scope of work covered in this proposal is as follows:

In order to address the safety advisory, UTA has decided to proceed with design, installation, and testing required to provide remote TDX monitoring and alarming when an active locomotive or cab car pilot cut-off valve is placed in "out" or "cut-out". The status information will be transmitted to TDX via the new Radwin Fiber in Motion system currently being tested and deployed by UTA across the FrontRunner fleet of vehicles. The TDX Control Office dispatch system will be upgraded to provide notification to the dispatcher and event logging for each time the pilot brake valve is cutout. Additionally, UTA will develop and implement disciplinary action for all instances that the pilot brake valve is cutout to bypass enforcement of the PTC system.

System Design

RMSS will update the following system-level design documents as follows:

- System Description Document
 - RMSS will generate a System Description Document (SDD) of necessary requirements that will:
 - Specify Pressure Switch and Setpoints to monitor the 53-pipe pressure
 - Specify any additional PLC inputs needed to determine active status of Cab or Locomotive, No Code Proceed (NCP), Penalty Brake Application, and ATC Cutout



- Specify Onboard (Cab Car or Locomotive) PLC hardware configuration
- Specify number of working and spare inputs/outputs for onboard PLC
- Describe onboard PLC logic and unique vehicle identifier
- Specify Cab Car/Locomotive interface for PLC power
- Specify Cab Car/Locomotive interface to UTA provided network
- Describe required modifications to TDX control office
- Develop TDX-PLC Interface Control Document (ICD)
- Specify Operations Requirements
 - Alarm Conditions and behavior
 - Define Display of Cutout Events
 - Define Operational Procedure including any forms with data required
- RMSS will provide input and support for updates to the UTA PTC Safety Plan as needed

Hardware Design

RMSS will provide redline mark-ups only for the following documents:

- UTA Locomotive Air Schematics
- UTA Cab Car Friction Brake Schematic
- Cab Cars – Bombardier Transportation Train Control System Schematics/Wiring Diagrams
- Locomotives – Motive Power UTA Schematics

Software Design

RMSS will complete the following software design activities as required:

- Develop PLC software applications for onboard PLC's
 - Each PLC will be able to uniquely identify the vehicle in which it is installed
- Develop TDX control office configurations to handle new alarms, indications, and dispatcher interface as required

Procurement

RMSS will procure the following items as required for this scope of work:

- Quantity of forty (40) pressure switches suitable for detecting the change in pressure of the 53 pipe
- Quantity of forty (40) PLC's for installation in each vehicle
- Associated onboard air system piping and fittings as needed
- Associated onboard wiring, terminal board and/or breakers as needed
- Software for programming PLC's
- Spare Parts
 - Four (4) additional onboard PLC's
 - Four (4) additional DC/DC power converters
 - Four (4) additional pressure switches for 53-pipe monitoring

Installation

RMSS will coordinate with FrontRunner vehicle maintenance and install the following items as described:

- Forty (40) Onboard pressure switches along with necessary air pipe fittings as needed to interface with existing system air piping



- RMSS will bench calibrate the switches to alarm and reset at the values designated in the approved SDD document
- Test equipment used to bench calibrate the pressure switches will be certified calibrated within the previous 12-month period
- Forty (40) Onboard PLC's and associated wiring
- RMSS will install network patch cabling between the onboard PLC and the on-board network switch
 - ****Note:** All onboard network equipment is to be provided and installed by the UTA radio department
- Update TDX program to reflect indications from onboard PLC's

Testing

RMSS will develop test procedures for review and approval by UTA. RMSS will perform testing according to the approved test procedures as follows:

- Proof of concept prototype testing
- Onboard point to point wiring checks
- TDX control and indication "C&I" testing
- System Integration Testing (SIT) for all vehicle and office modifications

Training

RMSS will develop training materials and provide the following training to UTA as part of this task order:

- Dispatcher Training
 - Two (2) Sessions to review
 - changes to the TDX User's Manual
 - updates to the TDX screens, alarms, dispatcher interfaces
- Vehicle Maintenance Training
 - Two (2) Sessions to review
 - Schematic redlines
 - Pressure switch calibration and installation
 - PLC Installation and IP configuration

Deliverables

RMSS will provide the following deliverables as part of this task order:

- Design Deliverables
 - System Description Document (SDD)
 - TDX Interface Control Document
 - Redlined vehicle schematics that reflect the as-in-service condition of the system
 - IP Address list for each vehicle PLC
- Testing Deliverables
 - Onboard Test Procedures
 - Completed Test Forms for each vehicle
- Training
 - Training outline
 - Coordination notification to operations prior to deployment of TDX changes
 - This notification will include a summary of updates to TDX



- Updates to the TDX User's manual for any changes
- RMSS intends on reviewing as-in-service documents and live demonstrations of TDX elements. As such RMSS has not included the creation of any power-points or instructor/student materials for this training program.

Clarifications

- The following documents can be used for reference to clarify details of scope.
 - UTA Locomotive Air Schematic
 - UTA Cab Car Friction Brake Schematic
 - UTA FRA Pilot Cut-Off Valve Monitoring Block Diagram
- RMSS understands the goal for this task order is to be complete by February 28th, 2024.
 - RMSS will make every possible effort to support this timeline, however there are several factors that are outside of the control of RMSS which have the potential to impact our ability to complete this scope within that timeframe. These factors include but are not limited to:
 - Supply chain issues that may affect PLC's, onboard instrumentation, wire, or network/radio equipment (by others)
 - Design, feasibility, procurement, installation, or integration of the Radwin Fiber in Motion system being installed by the UTA radio department across the FrontRunner fleet of vehicles
 - Access to the vehicle fleet for installation and testing of new equipment
 - Acceptance and buy-in from the FRA
 - Approval of changes to the PTCSP, PTCDP, or PTCIP as needed to proceed with the task order
 - Additional requests or comments from the FRA that affect or change the fundamental approach outlined in this proposal

RMSS will immediately communicate to UTA if any of the above items affect our ability to complete this task order by the February 28th, 2024 target completion date.

Assumptions

- RMSS assumes that UTA vehicles will be taken out of service for a minimum period of two days each for RMSS wiring and testing
- RMSS assumes that UTA will provide up to two vehicles for RMSS to work on at a time in order to meet project goals
- RMSS assumes that the network pathway provided by UTA will have sufficient sustained bandwidth to handle all necessary communications
- To minimize total vehicle out of service time and if desired by UTA, RMSS will attempt to coordinate its vehicle installation work with the corresponding network installation work by UTA

Work by Others

The following items are to be completed by others and are excluded from RMSS' scope of work:

- Procurement, installation, and configuration of all Radwin equipment on vehicles
- Procurement, installation, and configuration of network equipment to interface with Radwin TMU
- Procurement, installation, and configuration of WAN firewall/router in back office (if needed)
- Procurement, installation, and configuration of WAN network switch in back office (if needed)



- Development of operational and disciplinary procedures for improper use of the pilot brake valve cutout

Option Pricing

RMSS is pleased to provide pricing for the following requested options which may be added to the base scope of work and pricing:

Option 1: Migrate No Code Proceed (NCP) Function from IDEN to Wayside IT Network Path, add ATC Cutout and Penalty Indication to PLC and TDX

- The lump sum price for this option is: **\$297,280.00**
- The scope of work for this option is as follows:
 - Design
 - Update the SDD and TDX Interface Control Document to describe incorporation of the NCP function, migration away from IDEN data radios, and a phased implementation with a temporary “shadow mode”
 - Redlining of vehicle schematics to reflect wiring changes
 - Modifications to the TDX Control Office as needed in order to:
 - process NCP requests through a modified protocol
 - capture ATC cutout indications
 - capture penalty brake application indications
 - Updates to the TDX manual
 - Update onboard and back-office PLC programs to handle additional controls and indications
 - I/O wiring of forty (40) vehicles from PLC to peripheral devices to capture:
 - NCP request, mode, and authorization into the new PLC’s
 - ATC cutout switch position
 - Penalty application status
 - Testing and Commissioning`
 - Develop test procedures and test reports for migrated NCP functionality, ATC cutout status, and penalty status
 - SIT Testing of NCP request and authorization, ATC Cutout indication, and penalty status indication
- Option #1 Assumptions
 - Pricing for this option assumes that this work will be completed at the same time as the base scope of work.

The total price for the base scope and Option #1 is **\$1,419,326.00**.

This proposal is valid for 60 days, unless extended in writing by RMSS.

If you need any additional information, please don’t hesitate to contact us.



Sincerely,

A handwritten signature in blue ink, appearing to read "Anthony Ortolani", is positioned below the word "Sincerely,".

Anthony Ortolani
Area Manager
Rocky Mountain Systems Services

Attachments

- RMSS-52598-069 – Pilot Brake Cutout Cost Estimate Worksheet
- Pilot Cut-Off Valve Monitoring Block Diagrams

cc:

Marshall Wilson – RMSS
Dan Meservey – RMSS
Travis Baxter – RMSS
Doug Jones – RMSS

Procurement lead times may be affected by Covid-19 pandemic
Our pricing is in U.S. Dollars, F.O.B. Salt Lake City UT, and excludes all allowances, taxes, tariffs, licenses, and permits

UTA - On Call

RMSS-52598-069 Pilot Brake Cutout Bypass Mitigation

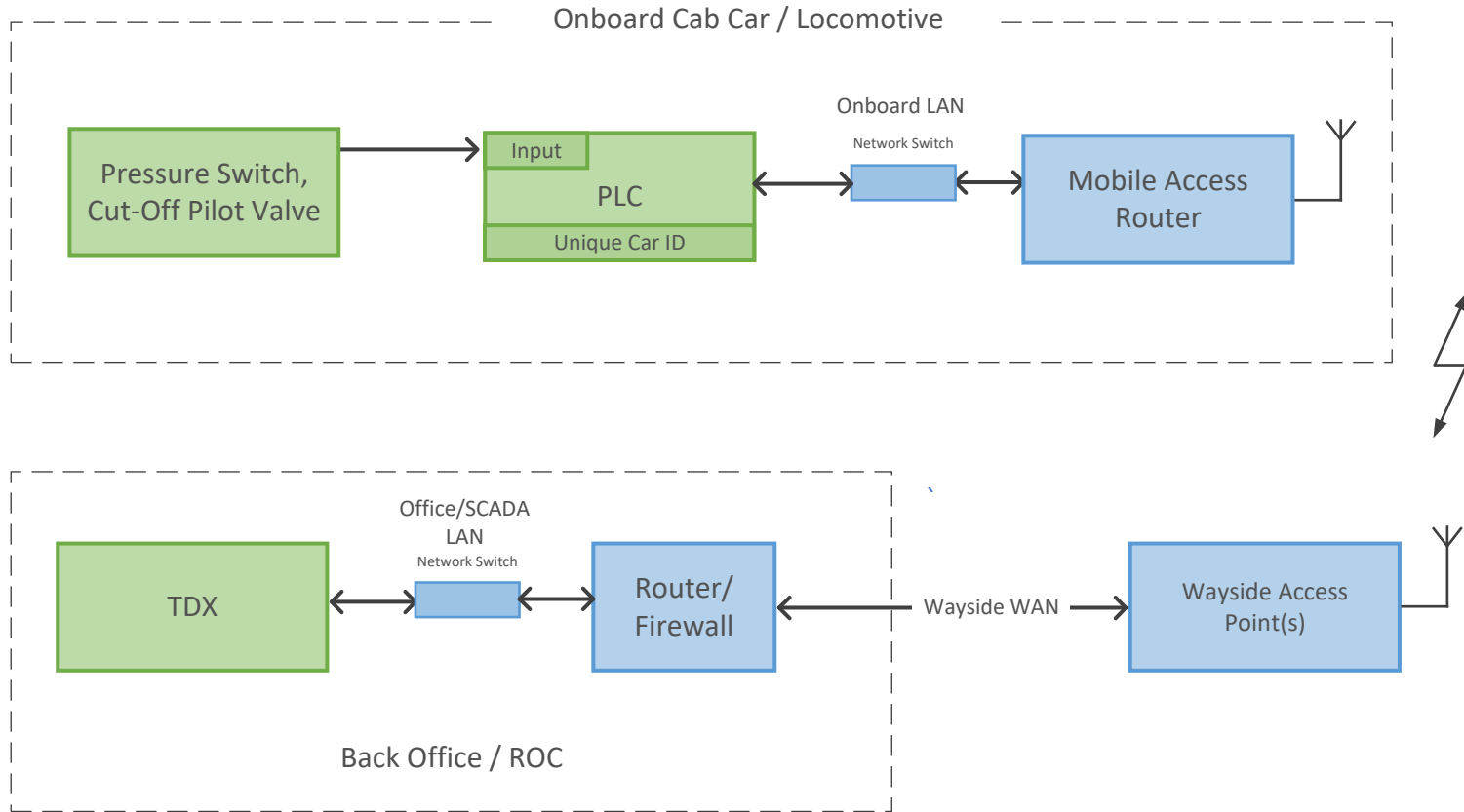
Task Order Estimate Summary





3/13/2023

Subcontractors	\$	-
Materials	\$	320,100.00
Administrative	\$	120,131.00
Design/Engineering	\$	258,222.00
Construction/Testing	\$	210,944.00
Travel & Perdiem	\$	6,000.00
Other Costs and Fee	\$	206,649.00
Total:	\$	<u>1,122,046.00</u>
Option #1: NCP Migration	\$	297,280.00
Grand Total (Base + Options)	\$	1,419,326.00

UTA FRA Pilot Cut-Off Valve Monitoring Block Diagram



-  RMSS Scope
-  UTA Scope