

Indian Railways
Centre for Design and Development
Chittaranjan Locomotive Works
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No: C-D&D/T/24(Part)/SIEMENS

Dated: As Signed

M/s Siemens Ltd.
Plot 6A, Maruti Industrial Area,
Huda, Sector 18, Gurgaon- 112 015

Sub: Permission for downloading trial software for M/s. Siemens make Three phase drive propulsion.

Ref: M/s SIEMENS Ref. No. SMO/RS/Propulsion/Software Trial dated 14.04.2025

1.0 Vide letter under reference above has intimated that that you are ready with combined software which bears software version 2.09 for CCU, 2.29 for TCU, 2.14 for DDU and Z431W0MA.999 for AC. Further it is mentioned that the following modifications/incorporation has been carried out in this trial software.

- i. Combined redundancy software for 800A & 1500A IGBT modules.
- ii. VCU redundancy for LEROY type VCU
- iii. Angle transmitter Failure mode improvement
- iv. TCU power supply monitoring
- v. Compressor not working if requested during off sequence
- vi. BP Pressure signal implausible
- vii. Identification of 1500A Type IGBT
- viii. Protection scheme for different type of TCC
- ix. Change in 4QC pulse control for standalone Aux variants
- x. Panto to be lowered in slave loco if Master is dead
- xi. TM isolation clarity in AMIT DDU
- xii. DPWCS Integration with MEDHA
- xiii. Modification of the PLL error loop to expand the input voltage frequency band

2.0 In addition to above it is intimated that to utilize the redundancy feature without any driver intervention an additional contactor relay with wiring modification is required inside VCU.

3.0 In view of the above, Competent authority has accorded permission for limited downloading of trail software as mentioned below in 05 locomotives at CLW as requested vide letter under reference above.

Device	Application	NSDB	OS	Para
CCU1	2.09	2.82	2.5	0.236
CCU2	2.09	2.82	2.5	0.236
TCU1	2.29	2.32	2.5	
TCU2	2.29	2.32	2.5	
WTB	3.13	2.85		
SIEMENS	1.2.2 (WAG-9)	2.81		

DISPLAY1	1.1.6 (WAP-7)			
SIEMENS	1.2.2 (WAG-9)	2.81		
DISPLAY2	1.1.6 (WAP-7)			
AMIT DISPLAY1	2.1.4	2.66		
AMIT DIAPLY 2	2.1.4	2.66		
AUX1	2.07	1.67		
AUX2	2.07	1.67		
AUX3	2.07	1.67		
IO STATION 11	1.05/1.22/2.00/0.21/0.23	1.00/ 0.002/0.01/2.00/1.02		
IO STATION 12	1.05/1.22/2.00/0.52	1.00/ 0.002/0.01/2.00/1.02		
IO STATION 21	1.05/1.22/2.00/0.21/0.23	1.00/ 0.002/0.01/2.00/1.02		
IO STATION 22	1.05/ 1.22/ 2.00/ 0.52	1.00/ 0.002/0.01/2.00/1.02		

In addition to above it is also advised to carry out the contactor modification in same 05 locomotives and demonstrated the redundancy features as stated in letter under reference above.

DA: Letter under reference above

ASHISH KUMAR
Digitally signed by ASHISH KUMAR
Date: 2025.05.06 18:15:07 +05'30'

(Ashish Kumar)
SEE/D&D

Copy to:

AEE/Loco/CLW: for Kind information and necessary action please

ASHISH KUMAR
Digitally signed by ASHISH KUMAR
Date: 2025.05.06 18:15:30 +05'30'

SEE/D&D

Joint Note

No. C D&D/T/26 (Part)/Siemens

Date :28.05.2025



Sub: Demonstration of 2.09 software trial

Ref: Siemens Letter No. SMO/RS/Propulsion/Software Trial dated 14.04.2025


In response to the letter under reference above shared for the software approval of CCU-2.09 with TCU 2.29 & DDU 2.1.4, BUR Z5G2N0MA.997 testing and demonstration was done on 38936 at CLW site, and jointly checked with IR representative.

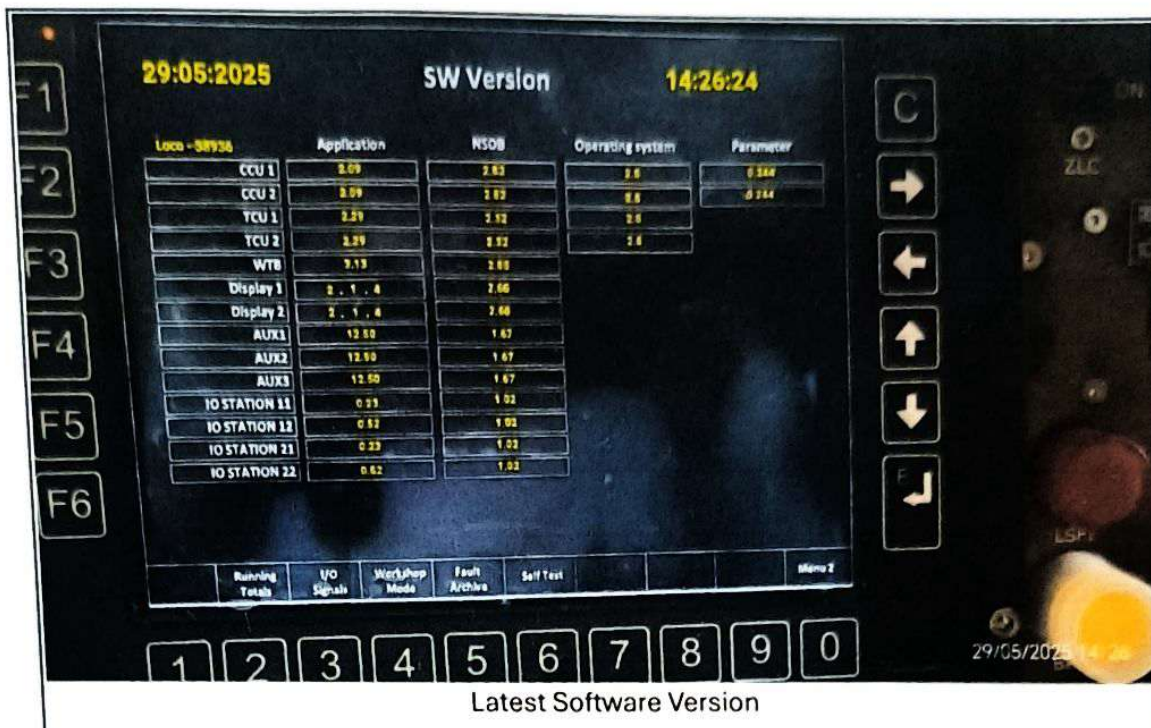
Redundancy feature for 1500A with reference (C-D&D/T/24) & 800A IGBT with reference (C-D&D/T/25) type configuration. Further it is to be noted that in each 4QC power module, there are two connectors X1→ Power supply and X2→ control signal. For demonstrating the 1/4th and 1/6th redundancy, the connector of line side and drive side was removed one by one and actual/demanded tractive effort at node 596 in standstill condition. The observation is appended below:

- 1) 1/6th redundancy is working normal with motor indication in display followed by crew message for driver and diagnostic event. Fault message for inverter module is 0305, after isolation of the single drive side converter, nodes were reaching to 596 with TE of 10-20 KN in standstill conditions. Further the screen with TM color was also changing to red.
- 2) It is to be noted that during the isolation of one rectifier of any TCC, traction of TM2/TM5 will be blocked to compensate for the power loss from the line side. This is basically fulfilling the requirement of 1/4th power reduction as one of the motors will only reduce 1/6th power, which is within the band in case of rectifier isolation.
- 3) 1/4th redundancy was working normal with crew messages for driver and diagnostic event. The fault message code for the rectifier module 2 in TCC1 was 0333 and rectifier module 1 in TCC-2 was 0334 and after isolation, nodes were reaching 596 with TE of 5-20 KN in standstill conditions. The same is depicted below in the snapshot for rectifiers of both TCC.
- 4) Bogie Cutout operation checked through Bogie cutout switch and it was observed that VCB was opening and after acknowledgement the nodes progressed to 596 with TE actual/demand. Further if the bogie cut out switch was normalized then again, the isolated Traction Converter was recovering and after acknowledgment normal operation was possible. However it is to be noted that if both the bogies were isolated through cut out switch and both Traction Converters got isolated and were reset only after MCE ON/OFF. Also, the indication of rectifier and inverter status on HMI was observed and generally found in order. This loco also had AMIT make DDU and so the modification has been validated.
- 5) DPWCS Integration for M/s MEDHA make has been checked through DPWCS simulator and basic functionalities like pairing, panto, VCB, TE/BE, Sanding, Bogie Cut out, Brake control was checked and found in generally in order. However, due to unavailability of rake the complete functionality at permissible speed was not checked and needs to be verified at concerned homing shed.

 Ankit Kumar Verma SSE/D&D/CLW	 Ved Prakash Gupta M/s Siemens
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- 6) In loco no. 38936 the diode modification was not available, so the functionality was not verified. However, M/s SIEMENS representative have intimated that the logic has been verified in ELS/LGD and same will be implemented in future supply and same will be demonstrated at CLW. Hence the verification for same is pending and needs to be validated once the diode modification are provided. Further the VCU redundancy for BRIO and RIOM module was also not validated as diode modification is not provided.
- 7) Presently at CLW converters with 800 Amp was not available thus the aforesaid software needs to be verified at ZR which has 800 Amp IGB based Traction Converter.
- 8) The failure mode operation switch was rotated in healthy position of master controller and there was no effect or message related to angle transmitter failure. Further when the connection of angle transmitter was disconnected then angle transmitter message popped up and then failure mode switch got activated after rotation. Thus the logic implementation of angle transmitter failure has been verified.
- 9) Compressor logic has been modified and the same has been validated. The logic was checked through manual operation of BLCP switch. It was getting on whenever it was demanded high by BLCP switch. Thus, the logic has been verified.
- 10) The BP implausibility modification is basically for CCB brake system. As in loco no. 38936 the brake system is FTIL, so the logic has been verified. Thus, it needs to be verified in field with loco having CCB brake system of M/s Knorr.
- 11) Panto lowering logic in slave in case of Master loco dead hasn't verified as two locos of M/s SIEMENS in multi was not available. Hence same needs to be verified at concerned ZRs.
- 12) M/s SIEMENS intimated that pulsing sequence of BUR has been modified to address the issue being faced in ZRs. During testing at CLW no abnormal tripping of BUR is reported due to the pulsing sequence. However it was observed that DC link Voltage was building only after throwing throttle which is above 590 Node so the issue of DC link voltage charging at 570 Node has been rectified. Thus, the efficacy of the same needs to be verified at ZRs
- 13) For TCU power contactors K15 and K45 have been provided inside the VCU-1 and VCU-2 respectively and checking was done by tripping of MCB and bogie isolation switch at time. No failure has been observed on account of this modification. In this basically M/s SIEMENS is provided a hardware safety for isolation of converter and can be accepted.
- 14) M/s SIEMENS manually enter wrong configuration in DDU which was for 800 Amp IGBT traction converter it was not allowing for further node progressing. This the safety interlock through screen has been validated but efficacy needs to be done at concerned ZR. The fault code 009 for the same is "SR configuration is not ok"
- 15) The RMS of loco no. 38896 has been activated and same has been observed on SILTS software provided by M/s SIEMENS. However the other 6000 Hp locos having RMS has not been activated yet and it was advised to expedite the same. Firm has asked for 15 days time.

	
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Ankit Kumar Verma

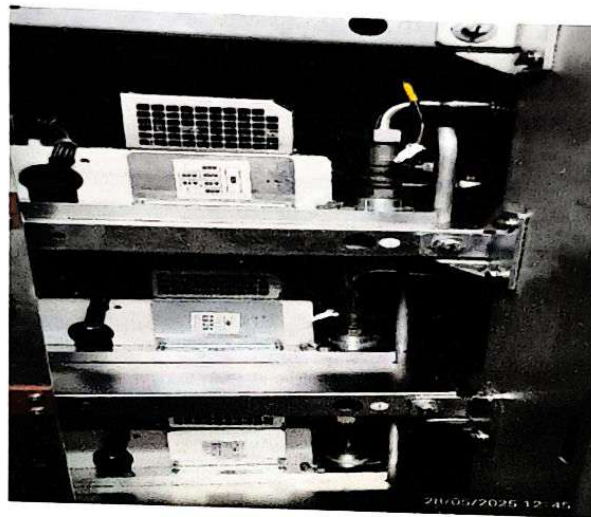
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M/s Siemens



TM-4 and Rectifier 1 of TC-2 pictogram



TCC2 Rectifier-1 & TM4 cutout by removing X1 connector.

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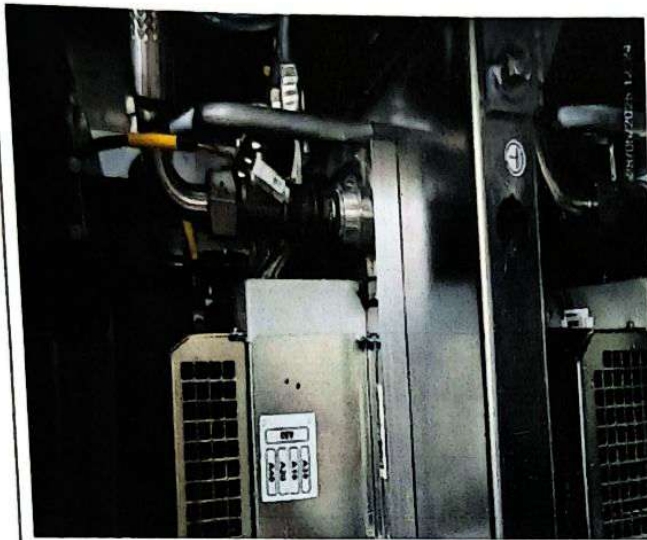
Ved Prakash Gupta
M/s Siemens



TM2 & Rectifier-2 of TC1



Node Progress

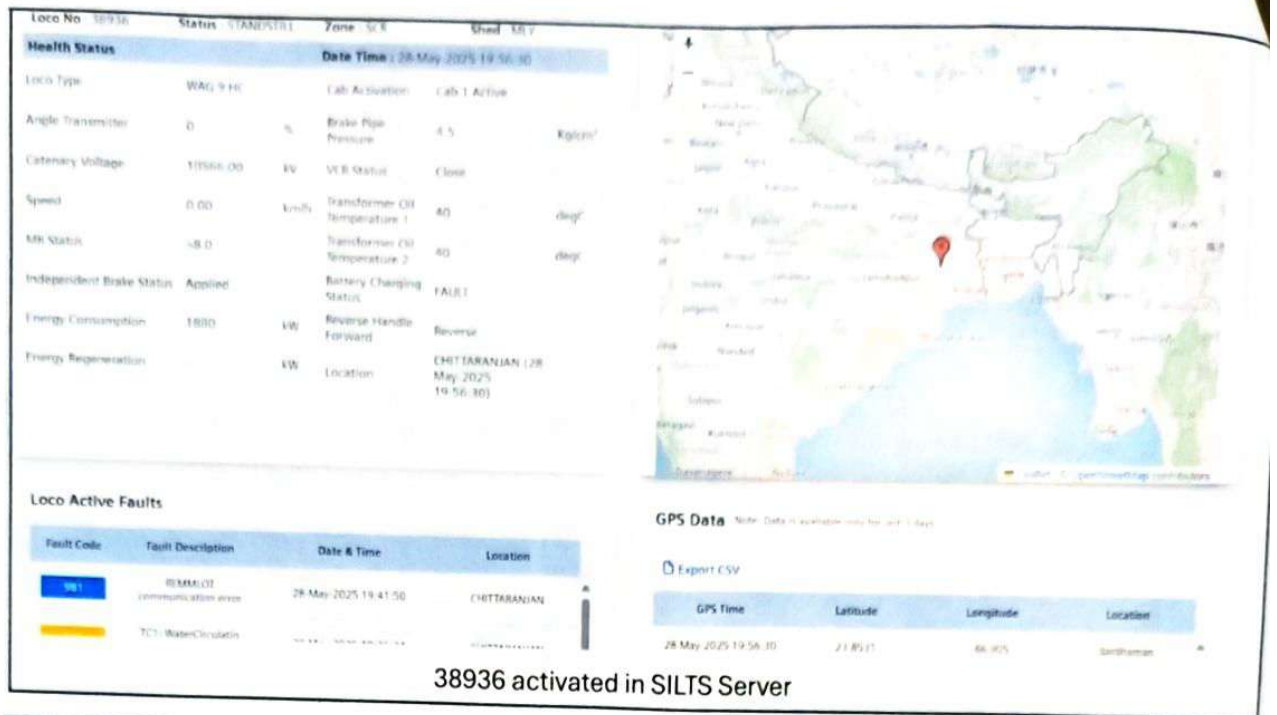


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4QC Pulsing will Start in 590 Node

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