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भारत सरकार / GOVERNMENT OF INDIA
रेल मंत्रालय / MINISTRY OF RAILWAYS
रेलवे बोर्ड / RAILWAY BOARD

No. 2023/S&T/Dev/Kavach/Corres Date: 20.08.2025

PCSTEs,
All Zonal Railways.

Sub: Circulation of important MoMs & JPO.

Please find enclosed the following documents for information and necessary action:

1. Railway Board Joint Procedural Order (JPO) dated 01.07.2025 regarding fitment, inspection, and training for Loco Kavach.
2. Minutes of Meeting dated 29.07.2025 regarding critical issues in Kavach implementation. (Item 7 & 8)
3. Minutes of Meeting dated 31.07.2025 on interoperability and ISA certification.

Encl.: As above,

Digitally signed by
V B MATHUR
Date: 20-08-2025
16:17:49

(V.B. Mathur)
Executive Director/S&T(Dev)-I
Railway Board

Copy to:

1. **PED/CoE/IRISET, Secunderabad,** For information & necessary action
2. **ED/Tele-II/RDSO, Secunderabad,** For information & necessary action

भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
रेलवे बोर्ड (Railway Board)

International Year of Cooperatives 2025
Cooperatives Build a Better World

No. 2023/S&T/Dev/Kavach.Corres.-Part-(1)

New Delhi, Dated : 01.07.2025

Director General (Elect / Traction) & S&T,
RDSO, Manak Nagar
LUCKNOW

Director General,
IRISET,
SECUNDERABAD

PCEEs & PCSTEs
All Zonal Railways
CLW, Chittaranjan

Sub: Joint Procedural Order for fitment, fitness, inspection and Training for Loco Kavach equipment on IR.

Ref: CLW Purchase order for 10000 nos Kavach Loco equipment

Approval of vendors for Kavach Version 4.0 has commenced on Indian Railways. Fitment of Kavach on locomotives at various sheds across IR has also begun. In order to streamline the procedure for fitment, fitness, inspection and training for Loco Kavach equipment on IR in various sheds, the following procedure is to be adopted:

1. Fitment, Inspection, Testing, and Approval of Loco Kavach under the CLW Purchase Order:

The following procedure shall be followed:

I. Loco Kavach material inspected by RDSO will be installed on locomotives as per the distribution issued by CLW to various loco sheds.

II. After the Kavach fitment in locomotives and joint testing with the OEM as per the pre-commissioning checklist (PCCL), the PCCL shall be jointly signed by the nominated SSE/JE (Elect.) of the loco shed and the OEM representative.

III. Scenario-Testing of Kavach-fitted locomotives shall also be carried out on the test track available in the loco shed as per the simulation test protocol.

01.07.25

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...2/-

IV. Once the Loco Kavach is fully tested in the shed, it shall be so mentioned in the Engine fitness certificate by incorporating an item for Kavach fitness.

V. The installation of the test track in the loco sheds is to be supervised by SSE/S&T to be nominated by Sr DSTE of the division where the shed is located.

2. Training of Shed Officials:

I. IRISET has been instructed to organize training courses in consultation with the Centre for Excellence (CoE) for training of shed staff in effectively carrying out various tests required to be done post installation on the Locomotive.

II. All pneumatic / testing supervisors of the shed, loco shed officers involved in the Loco Kavach fitment/testing and operation officers (electrical & mechanical from division), shall be nominated for this training as per the schedule to be planned by Zonal Railways (PCEEs).

III. The training will cover understanding of the pre-commissioning checklist, Loco Kavach fitment and troubleshooting techniques for Kavach systems.

3. Loco Kavach fitness:

The fitness of the Loco Kavach equipment will be valid for a period matching the schedule inspection of the locomotive. However, the fitness will not automatically expire in case of overdue locos except in case of equipment failure.

This issues with the approval of Board (MI and MTRS).

V B Mathur 01.07.25

(V.B. Mathur)
Exe. Dir. (S&T) Dev-I
Floor No. 1, Room No. 150-A,
Railway Board
Tele: 011-47843025
E mail : virendra.b.mathur@gov.in

Asingh 01/07

(Avinash Singh Kushwah)
Exe. Dir. Elect. Engg. (RS)II
Floor No. 1, Room No. 113,
Railway Board
Tele : 011-23387736
E mail : edeers@rb.railnet.gov.in

भारत सरकार / GOVERNMENT OF INDIA
रेल मंत्रालय / MINISTRY OF RAILWAYS
रेलवे बोर्ड / RAILWAY BOARD

No. 2023/S&T/Dev/RDSO.Corres. Dated: 29.07.2025

DG/IRISET,
Secunderabad.

DG/RDSO,
Lucknow.

Sub: Minutes of Meeting held on 15.07.2025 regarding critical issues related to implementation and standardisation of Kavach System.

Ref: RB Letter No. 2023/S&T/Dev/RDSO.Corres. dated 10.07.2025.

A meeting was held on 15.07.2025 at Railway Board under the chairmanship of MI & MTRS to discuss critical issues related to implementation and standardisation of Kavach System.

The Minutes of Meeting detailing discussions and directions issued are enclosed herewith for information and necessary action by all concerned stakeholders.

The MoM is being issued with the approval of Board (MI & MTRS).

Digitally signed by
V B MATHUR
Date: 29-07-2025
16:08:47

(V.B. Mathur)
Executive Director/S&T(Dev)-I
Railway Board

Copy to:

1. PSO to MI: For Kind information of MI
2. PSO to MTRS: For Kind information of MTRS
3. PPS to AM/Sig: For Kind information of AM/Sig
4. PPS to AM/Traction: For Kind information of AM/Traction
5. Shri Suresh Kumar, PED/S&T, RDSO, Lucknow
6. Shri Lalit Kumar Mansukhani, PED/CoE, IRISET, Secunderabad
7. Shri V. Venkatasubramanian, ED/EE(RS)-I, Railway Board
8. Shri Avinash Singh Kushwah, ED/EE(RS)-II, Railway Board
9. Shri Vinod Kumar, EDME/(PU & W), Railway Board
10. Shri G. Pavan, ED/Tele-II, RDSO, Secunderabad
11. Shri Nitin Mehrotra, ED/Motive Power, RDSO, Lucknow
12. Shri Madhup Mohan Shrivastava, Director/Signal-IV, RDSO, Lucknow
13. Shri T. Nagraj, Director-I/T&RS, CoE/IRISET, Secunderabad
14. Shri Arvind Pandey, Director/System, Traction & Power Supply, RDSO, Lucknow
15. M/s Medha Servo Drives Pvt. Ltd., Hyderabad- Design representatives
16. M/s HBL Power Systems Limited, Hyderabad - Design representatives
17. M/s Kernex Microsystems India Ltd, Hyderabad -Design representatives

Minutes of Meeting held on 15.07.25 in the Railway Board under the chairmanship of MI & MTRS for standardisation and implementation of Kavach system across Indian Railways.

Ref: RB letter No. 2023/S&T/Dev/RDSO.Corres. Dated: 10.07.2025.

Members Present:

Shri Naveen Gulati	Member/Infra
Shri Braj Mohan Agrawal	Member/Traction & Rolling Stock
Smt. Vijaylaxmi Kaushik	AM/Signal, RB
Shri Vijay Pratap Singh	AM/Traction, RB
Shri Saurabh Bandopadhyaya	PED/S&T(Dev.), RB
Shri Suresh Kumar	PED/S&T/RDSO,Lucknow
Shri Lalit Kumar Mansukhani	PED/CoE/IRISET, Secunderabad
Shri V. B. Mathur	ED/S&T(Dev.)-I, RB
Shri Harsh Deep Srivastava	ED/S&T(Dev.)-II, RB
Shri V. Venkatasubramanian	ED/EE(RS)-I, RB
Shri Avinash Singh Kushwah	ED/EE(RS)-II, RB
Shri Vinod Kumar	EDME/(PU & W), RB
Shri. Pavan Kumar Gudavalleti	ED/Tele-II, RDSO, Secunderabad
Shri Nitin Mehrotra	ED/Motive Power, RDSO, Lucknow
Shri Madhup Mohan Shrivastava	Director/Signal-IV, RDSO, Lucknow
Shri T. Nagraj	Director-I/T&RS, CoE/IRISET, Secunderabad
Shri Arvind Pandey	Director/System, Traction & Power Supply, RDSO, Lucknow
Kavach Vendors:	
M/s Medha Servo Drives Pvt. Ltd, Hyderabad	Kernex Microsystems India Ltd, Hyderabad
M/s HBL Power Systems Limited, Hyderabad	

VD Mathur 29.07.25

Avinash 29/07

Vide reference above, a meeting was held under the chairmanship of Member (Infrastructure) & Member (Traction & Rolling Stock) on 15.07.2025 (Tuesday) in the Railway Board to deliberate upon key issues concerning the standardisation and implementation of Kavach system across Indian Railways.

Following important Agenda Items were discussed:

1. Universal Braking Algorithm – Validation & Trials
2. Methodology to Finalise Braking Parameters (in reference to item no. 1 above)
3. ISA Certification – Requirements related to Locomotives
4. Kavach MMC (Mobile Maintenance Car)

Points noted in the meeting:-

1. A brief presentation was made by PED/CoE/IRISET on the development and application of the Universal Braking Algorithm. It was informed that trials of the algorithm have been conducted for many brake and locomotive combinations. The results of these trials were shared through CoE's letter No. IRISET/CoE/Kavach/Misc dated 09.07.2025. Member(Infra) observed that the trials were primarily limited to LHB coaches with WAP-7 locomotives and light engines, focusing on speed and few other brake-influencing factors. However, it was noted—based on discussions with ED/Motive Power/RDSO —that braking parameters may also vary depending on weather conditions, gradients, brake shoe types, rail conditions, etc. Presently the braking trials have been conducted on coaching stock only. It was planned to do validations for different variants of freight stock also including variants of freight locomotives. Therefore, standard testing and validation requirements covering all brake affecting parameters need to be finalized in consultation with all stakeholders in RDSO including ED/Motive Power for brake related matters.

2. Accordingly, it was decided to constitute a committee to finalize the requirements for testing, trial and validation of the Universal Braking Algorithm.

3. The committee will be tasked to prescribe the methodology and requirements for testing and validation of the Universal Braking Algorithm and will submit its recommendations to the Railway Board. Based on these recommendations, CoE will conduct the trials of the Universal Braking Algorithm, including finalization of the braking parameters.

4. All the OEMs assured their commitment to migrate to the new Universal Braking Algorithm. They were also informed that the Universal Braking Parameters are to be adopted after the approval of the committee's recommendations.

29.07.25

29/07

5. The meeting also discussed the possibility of distributing the number of trials required for finalization of braking parameters for different combinations among the OEMs to ensure faster outcomes. CoE is entrusted to decide the distribution among the vendors as per the feasibility.

6. The work of coding the algorithm may be initiated simultaneously by all OEMs and has to be completed in a time bound manner.

7. As regards to Loco Kavach, It was decided that, after approval of a locomotive type and Loco Kavach make (of a vendor) by ISA and RDSO, specific ISA certification will not be required for individual locomotives which will be done as per JPO issued by Railway Board letter No.2023/S&T/Dev/Kavach.Corres. - part (1) dated: 01.07.2025.

8. The process of fitment of onboard Kavach equipment on the locomotives shall be audited by CELE quarterly and Sr DEE/Shed monthly. It was deliberated and decided that ISA certification for individual sheds will not be required.

9. Regarding the Mobile Maintenance Car (MMC), it was decided that the fitment of the MMC will be carried out based on minimum modification, as proposed by the PU Directorate. The fitment will be undertaken by ICF, for which the necessary Kavach component & specifications approval for Kavach and S&T equipment will be given by CoE, along with deployment of manpower for quality assurance of these items. Additionally, one officer from CoE may also be nominated to the tender committee for procurement of Kavach specific equipment/ instrument/ component etc. for MMC at ICF. All efforts should be made to ensure manufacture of the prototype MMC by October 2025.

This is issued with the approval of Board (MI & MTRS).

No. 2023/S&T/Dev/RDSO.Corres.
July 29, 2025

V.B.Mathur 29.07.25

V.B.Mathur
Executive Director/S&T(Dev.)-I
Railway Board

Avinash 29/07/25

Avinash Singh Kushwah
Executive Director/EE(RS)-II
Railway Board

Minutes of meeting with Railway Board, RDSO & KAVACH firms to discuss on ISA Certification for interoperability on 31.07.2025

Members present:

1. Shri Saurabh Bandhopadhyay, PED/S&T Dev./Railway Board
2. Shri Lalit Mansukhani, PED/CoE/IRISET/SC
3. Shri Vijay Serwal, ED/SD/CoE/IRISET/SC
4. Shri G.Pavan Kumar, ED/Tele-II/RDSO/SC
5. Shri M.Muni Kumar, ED/TD/CoE/IRISET/SC
6. Shri R.N.Singh, AIE/RDSO/SC
7. Shri Hemant Sagade AGM/R&D/Signalling, M/s.HBL
8. Shri Pradeep Kongalla, GM/Systems, M/s.HBL
9. Shri M Srinivas Reddy , SM/R&D, M/s.Medha
10. Shri Hemanth SM/R&D, M/s.Medha
11. Shri Narayan Raju MD, M/s.Kernex
12. Shri Vishnu Murthy, CTO, M/s. Kernex
13. Shri TVLN Pavan Phani Kumar, Manager(Designs), M/s.Kernex

Meeting is held RDSO office/Secunderabad and the meeting is chaired by PED/S&T/Dev/Railway Board. **The agenda of the meeting was ISA certification for interoperability.**

Requirement of FRS & SRS on interoperability:-

Clause 2.8 (FRS): Interoperability

"*The interoperability requirements for the Stationary KAVACH are related to the data exchange between the Stationary KAVACH and the Onboard KAVACH, TSR interface, Direct EI interface based on OEM proprietary protocols, adjacent Stationary KAVACH interface, RFID Tag Data, Network Monitoring System (NMS) and Key Management System.*"

Clause 25.6 (SRS): Interoperability tests

Clause 25.6.1 " *The KAVACH system developed by vendor shall be interoperable with existing vendors. This shall be tested in RDSO lab or IRISET Lab for communication between Onboard KAVACH of applying vendor with Stationary KAVACH of existing vendors and Stationary KAVACH of applying vendor with Onboard KAVACH of existing vendors.*"

Requirement of SOP on Interoperability: (Standard Operating Procedure (SOP) for Generic Product Approval of KAVACH)

"SN 2.4 *: Interoperability Lab Test*

Prerequisite:

- *70% Functional Testing completed.*
- *Test installation completed in IRISET.*

Conditions for Approval:

- *Lab tests governed by the test format SIF 0594, including KMS Keys, MA, Track Profile and other safety-related tests completed.*"

..equirement of ISA:

As per above interoperability is part of specification for KAVACH and an important safety requirement

An it was agreed by all participating officials that Interoperability ISA has be responsibly done as being the stake holders in KAVACH development process

The discussions in the meeting LED to following common points to done for ISA for Interoperability

The KAVACH system developed by an applying vendor shall demonstrate interoperability with systems from at least two existing vendors. This interoperability shall be tested for communication between:

- The applying vendor's Onboard KAVACH and the Stationary KAVACH systems of existing vendors, and
- The applying vendor's Stationary KAVACH and the Onboard KAVACH systems of existing vendors.

All vendors shall conduct interoperability testing with at least two other vendors and submit an ISA report certifying interoperability.

The report must cover a minimum of

(I) one type of locomotive with Loco Kavach of the vendor and include testing for all scenarios defined in the Interoperability Test Format with two stationary Kavach of different vendor make. Additional tests shall be conducted if required by the ISA.

(II) The Station Kavach of the vendor has to be tested with Loco Kavach of two other vendors

(III) For Any other Loco type other than the one tested by the ISA interoperability test would be carried out by RDSO after generic approval of ISA and before approval of the RDSO for the Loco type

(IV) Necessary co-operation will be extended by all stake holders

The ISA report shall be submitted by 15 Sept-2025.

File No :RDSO-SIG0MISC(MOM)1-2020 Dated 01.8.2025

A - Arunachalam

M/s.Medha

Arunachalam A.
General Manager (R&D, Signalling),
Medha Servo Drives Pvt. Ltd.

M/s.HBL

Vishnu B, CTO

M/s.Kernex

Pavan Kumar

Digitally signed by Pavan Kumar
Date: 2025.08.12 16:00:56 +05'30'

ED/Tele-II/RDSO/SC