GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

KAVACH Interoperability test format for various scenarios with approved vendors

Issued by

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Document Title: KAVACH Interoperability test format for various scenarios with approved vendors

Document Control

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Document History

#	Issue	Version	Reason for Amendment
1.	First	1.0	First issue as per RDSO/ SPN/196/2020 (Version 4.0)
2.	2nd	1.1	Override interoperability testing added in clause 3.12.

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1 Introduction

1.1   This document describes the procedure to be followed to perform for testing interoperability of Stationary KAVACH & Onboard KAVACH of vendors under approval in IRISET or RDSO lab. The objective of this test procedure is to verify the following in sequence:

1.2   **Checksum details of Onboard Kavach Unit under test:** DMI Screen Info and Confirmation button shall be pressed for noting checksum value of modules as below.

Card/ Module	Checksum

1.3   **Checksum details of Stationary KAVACH Unit under test: See in SM-OCIP**

Card/ Module	Checksum

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1.4   Onboard KAVACH interoperability test

(a)   Verification of KMS key

(b)   Verification of Signal aspect linking and Signal naming, MA correspondence – This ensures check of proper registration and radio communication of Onboard KAVACH unit under test with Stationary KAVACH of existing vendor.

(c)   Verification of PSR, TSR

(d)   Verification of SPAD prevention

(e)   Verification of collision scenarios

(f)   Verification of Manual SoS

1.5   Stationary KAVACH interoperability test

(a)   Verification of KMS key

(b)   Verification of SKAVACH-to-SKAVACH communication

(c)   Verification of NMS communication

(d)   Verification of TSRMS communication

(e)   Any one existing vendor of Onboard KAVACH shall be tested as per 1.4 (b) to (f).

2 Pre-requisites

The following are to be ensured prior to start of interoperability testing

(a)   Existing vendor Stationary KAVACH & Onboard KAVACH are working properly and having valid keys.

(b)   Adjacent Stationary KAVACH connectivity is established.

(c)   TSRMS connectivity is established.

(d)   NMS details are programmed and connected to the test Stationary KAVACH.

(e)   RFID tag simulators

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3 Onboard KAVACH interoperability test

Onboard KAVACH ID		Vendor name under interoperability test	
Vendor name of Stationary KAVACH			

3.1   Verification of KMS key:

SN	Stationary KAVACH ID	No of KMS Key available)	
1			

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3.2 MA related tests:

The Onboard Kavach movement shall be carried out with existing approved stationary KAVACH section in lab and verify the details as mentioned below tables. The results shall be tabulated below:

SN	ENTRY SIGNAL	EXIT SIGNAL	ENTRY SIGNAL ASPECT	EXIT SIGNAL ASPECT	ENTRY SIGNAL NAME on DMI	MA IN SECTIONS as per ToC	MA value received on DMI	Result (Ok/ Not Ok)
1								
2								
3								
4								
5								
6								

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3.3 RFID Linking (To be tested in field)

SN	Stationary KAVACH ID	ENTRY SIGNAL	EXIT SIGNAL	REF RFID (Signal Foot Tag)	RFIDs in the route	Any tags missing	Any Invalid tags found	Result (Ok/ Not Ok)
1								
2								

3.4 KAVACH TSR speed control test reports

SN	Stationary KAVACH ID	Route ID	Imposed location by TSRMS		Imposed Speed	Location Authorized by Onboard Kavach		Imposed Speed by Onboard KAVACH	Result (Ok/ Not Ok)
			From	To					
1									
2									

3.5 KAVACH PSR speed control test reports:

SN	Stationary KAVACH ID	Route ID	Imposed location by PSR		Imposed Speed	Location Authorized by Onboard Kavach		Imposed Speed by Onboard KAVACH	Result (Ok/ Not Ok)
			From	To					

Signature with Date		Signature with Date	
Name and Designation (Firm Representative)		Name and Designation (RDSO official)	

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1								
2								

3.6   KAVACH SPAD Prevention test reports

SN	Stationary KAVACH ID	Entry Signal	Exit Signal	Stopping Distance before Exit Signal	Result (Ok/ Not Ok)
1					
2					

3.7   KAVACH Rear End collision test reports-.

SN	Stationary KAVACH ID	Entry Signal	Exit Signal	Distance from which Rear end collision message is displayed	Stopping Distance from Rear Loco	Result (Ok/Not Ok)
1						
2						

3.8   KAVACH Head ON collision test reports-

SN	Stationary KAVACH ID	Entry Signal	Exit Signal	Distance from which Head on collision message is displayed	Stopping Distance from the Loco	Result (Ok/Not Ok)
1						

Signature with Date		Signature with Date	
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2					

3.9   KAVACH Unusual Stoppage in Block section test reports –

- This SoS will not be generated in the Station Section. For this purpose, the Station section shall be matching with the details prescribed in the Station Working Rules. The Tag data is to be checked for this.
- In case of diverging lines, the adjacent tag shall be placed suitably, to avoid stopping of trains where not required.

SN	Stationary KAVACH ID	Entry Signal	Exit Signal	Stopping Distance	Result (Ok/ Not Ok)
1					
2					

3.10   Manual SoS Generation from Stationary KAVACH test reports:

SN	Stationary KAVACH ID	Entry Signal	Exit Signal	Stopping Distance	Result (Ok/ Not Ok)
1					
2					

SN	SOS generation after pressing SOS button in SMOCIP (Y/N)	Time duration between pressing the button and SOS generation	After cancelation, whether SoS stopped	Result (Ok/ Not Ok)

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1				
2				

3.11　　　Manual SoS Generation from Onboard KAVACH test reports:

SN	Onboard KAVACH ID	Entry Signal	Exit Signal	Stopping Distance	Result (Ok/ Not Ok)
1					
2					

3.12　　　override from onboard KAVACH test report:

SN	On-board KAVACH ID	Entry Signal	Mode	Exit Signal	MA section	Tag linking	Result (Ok/ Not Ok)
1.		Home Signal					
2.		Starter					
3.		Adv Starter					
4.		Routing Home					
5.		Routing Starter					
6.		IB stop Signal					
7.		LC gate stop					
8.							

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		Multiple override of Home, starter and adv Starter					

Note: After override of IB stop signal, no brake be applied in permissive signal.

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4 Stationary KAVACH interoperability test:

Stationary KAVACH ID		Vendor name under interoperability test	
Onboard KAVACH ID		Vendor name of Onboard KAVACH	

The following test shall be carried out in stationary KAVACH under test as mentioned below.

4.1 Verification of KMS key

SN	Stationary KAVACH ID	No of KMS Key available	
1			
2			

4.2 Connectivity with adjacent stationary KAVACH as per IP address scheme of Annexure-A3

SN	Stationary KAVACH ID	IP address	Port No	Adjacent Stationary KAVACH ID	IP address	Port No	Result (Ok/Not Ok)
1							
2							

4.3 Proper handing over and taking over of border tag – SKAVACH ID.

SN	Boarder ENTRY SIGNAL	EXIT SIGNAL	Border ENTRY SIGNAL ASPECT	EXIT SIGNAL ASPECT	Border ENTRY SIGNAL NAME on DMI	MA IN SECTIONS as per ToC	MA value received on DMI	Result (Ok/Not Ok)

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1							
2							

4.4   Connectivity with Network Monitoring System- Check that packets are logged in NMS in line with Annexure-G (not mandatory, can be demonstrated subsequently also).

SN	Stationary KAVACH ID	IP address	Port No	NMS ID	IP address	Port No	Result (Ok/ Not Ok)
1							
2							

4.5   Connectivity with TSRMS-

SN	Stationary KAVACH ID	IP address	Port No	TSRMS ID	IP address	Port No	Result (Ok/ Not Ok)
1							
2							

4.6   Onboard KAVACH –

The existing vendor onboard KAVACH movement shall be carried out for testing interoperability in the stationary Kavach being approved and verify the details as mentioned below tables:

Signature with Date		Signature with Date	
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4.6.1 MA related tests:

The Onboard Kavach movement shall be carried out with existing approved stationary KAVACH section in lab and verify the details as mentioned below tables. The results shall be tabulated below:

SN	ENTRY SIGNAL	EXIT SIGNAL	ENTRY SIGNAL ASPECT	EXIT SIGNAL ASPECT	ENTRY SIGNAL NAME on DMI	MA IN SECTIONS as per ToC	MA value received on DMI	Result (Ok/ Not Ok)
1								
2								
3								
4								
5								
6								

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Name and Designation (Firm Representative)		Name and Designation (RDSO official)	

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4.6.2 RFID Linking (To be tested in field)

SN	Stationary KAVACH ID	ENTRY SIGNAL	EXIT SIGNAL	REF RFID (Signal Foot Tag)	RFIDs in the route	Any tags missing	Any Invalid tags found	Result (Ok/ Not Ok)
1								
2								

4.6.3 KAVACH TSR speed control test reports

SN	Stationary KAVACH ID	Route ID	Imposed location by TSRMS		Imposed Speed	Location Authorized by Onboard Kavach		Imposed Speed by Onboard KAVACH	Result (Ok/ Not Ok)
			From	To					
1									
2									

4.6.4 KAVACH PSR speed control test reports:

SN	Stationary KAVACH ID	Route ID	Imposed location by PSR		Imposed Speed	Location Authorized by Onboard Kavach		Imposed Speed by Onboard KAVACH	Result (Ok/ Not Ok)
			From	To					

Signature with Date		Signature with Date	
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1							
2							

4.6.5 KAVACH SPAD Prevention test reports

SN	Stationary KAVACH ID	Entry Signal	Exit Signal	Stopping Distance before Exit Signal	Result (Ok/ Not Ok)
1					
2					

4.6.6 KAVACH Rear End collision test reports-.

SN	Stationary KAVACH ID	Entry Signal	Exit Signal	Distance from which Rear end collision message is displayed	Stopping Distance from Rear Loco	Result (Ok/Not Ok)
1						
2						

4.6.7 KAVACH Head ON collision test reports-

SN	Stationary KAVACH ID	Entry Signal	Exit Signal	Distance from which Head on collision message is displayed	Stopping Distance from the Loco	Result (Ok/Not Ok)
1						
2						

Signature with Date		Signature with Date	
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4.6.8 KAVACH Unusual Stoppage in Block section test reports –

- This SoS will not be generated in the Station Section. For this purpose, the Station section shall be matching with the details prescribed in the Station Working Rules. The Tag data is to be checked for this.
- In case of diverging lines, the adjacent tag shall be placed suitably, to avoid stopping of trains where not required.

SN	Stationary KAVACH ID	Entry Signal	Exit Signal	Stopping Distance	Result (Ok/ Not Ok)
1					
2					

4.6.9 Manual SoS Generation from Stationary KAVACH test reports:

SN	Stationary KAVACH ID	Entry Signal	Exit Signal	Stopping Distance	Result (Ok/ Not Ok)
1					
2					

SN	SOS generation after pressing SOS button in SMOCIP (Y/N)	Time duration between pressing the button and SOS generation	After cancelation, whether SoS stopped	Result (Ok/ Not Ok)
1				

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2			

4.6.10   Manual SoS Generation from Onboard KAVACH test reports:

SN	Onboard KAVACH ID	Entry Signal	Exit Signal	Stopping Distance	Result (Ok/ Not Ok)
1					
2					

Signature with Date		Signature with Date	
Name and Designation (Firm Representative)		Name and Designation (RDSO official)	