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No. CORE/S&T/Tele/Tender/900 (Policy) Date: 15.05.2017

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Railway Electrification,
Ambala, Ahmedabad, Bhubaneswar,
Chennai, Danapur, Jaipur, Lucknow,
Kolkata, New Jalpaigudi & Secunderabad
Dy.CSTE-I/RE/Jabalpur
Dy.CSTE-II/RE/Jabalpur

Sub: Arrangement to be made in connection with new SCADA system as per RDSO specification no.TI/SPC/RCC/SCADA/0130 (Rev 2) (July'16).

Ref: (i) CAO/CORE letter No. ELCORE/New Drgs-Specs/16 (Part – II), dtd 10.2.2017 (copy enclosed)
(ii) CEE/Works Note No.ELCORE/T/SCADA/Policy/316 Pt-V, dtd 02.05.17 (copy enclosed)

RDSO has issued new SCADA specifications vide specification no.TI/SPC/RCC/SCADA/0130 (Rev.2). Further clarification has been taken from Electrical deptt vide note at ref.(ii) which is enclosed for ready reference.

In view of this, please ensure provision of the following.

(i) 2 E1 channels to be made available from STM at OFC hut at stations to the RTU and 2 E1 channels to be made available from STM of nearest OFC hut at Division to RCC. The schematic diagram is shown in para 4.4 of the referred specification of SCADA system.

(ii) Arrangement of laying of OFC and 6 Quad Cable to be made between OFC huts at stations and RTU (Remote Terminal Unit) as well as between nearest OFC hut to the divisional control where RCC (Remote Control Center) exists as advised by CEE/Works/CORE's note under ref at (ii)

For guidance, copy of section 4 (communication medium) of the referred specification in 2 pages is also enclosed herewith.

DESPATCHED 12 MAY 2017

Sig. of Despatcher

DA: As Above

(D.K.Sinha)
Dy.CSTE/HQ
For CSTE/Proj./CORE/ALD

Copy to- CEE/Works/CORE- For kind information please.

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TRACTION INSTALLATION DIRECTORATE
कर्षणसंस्थापननिदेशालय

सत्यमेव जयते

GOVERNMENT OF INDIA MINISTRY OF RAILWAYS
भारतसरकार, रेलमंत्रालय

TECHNICAL SPECIFICATION
FOR
SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEM
FOR
25kV Single Phase 50Hz ac Traction Power Supply

SPECIFICATION NO: TI/SPC/RCC/SCADA/0130
(Rev.2)

विशिष्टिसंख्या: टी•आई•/स्पेक/आरसीसी/स्काडा/0130 (रिवी•2)

Revised in: (July, 2016)

ISSUED BY
RESEARCH DESIGNS AND STANDARDS ORGANIZATION,
LUCKNOW 226011

Sr. No.	Revision No.	Issue Date	Total Page
1.	0		
2.	1	December 12, 2014	71
3.	2	July 26, 2016	71

	Prepared By	Checked By	Approved By
Signature			
Designation	SSE/SCADA	DTI(OHE-E)	EDTI(Co-ord.)

CSTE/HQ
Sh. Sinha Sir
RDSO/PE/SIG

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provided by the SCADA vendor. Necessary assistance/ information to be provided by the purchaser on the fiber interface available to select appropriate media convertors.

4.5 The Railways/purchaser shall have to ensure the availability of E1 channel and medium of communication. The scheme of communication comprises of the following:

a. 2 E1 made available by S & T from STM at OFC Hut and 2 E1 at the division. 2 E1 at Division shall be required for making ring, to make the communication redundant whereas 2E1 at post shall be required for communication for the post as well to connect next post. Last post second E1 may be through other OFC network to make the ring by connecting RCC/STM at Division.

b. CISCO 1921 series Router/ CTC Converter or equivalent with minimum 2-port T1/E1 Multiflex Trunk Voice/WAN Interface Card). The equipment should be provided with forced cooling arrangement.

c. LAN extender at OFC Hut — Firm will provide.

d. LAN extender at post

4.6 Successful manufacturer shall offer high speed communication methodology and their supporting media converters, switches and connectors etc, taking into account communication channels offered and respective site conditions. In any case satisfactory working and full functionality of SCADA system under all conditions shall be ensured.

4.7 **Technical Requirements of Router & LAN extender**

a. To be used for TCP/IP base communication with data rate of 2 Mbps over a twisted pair copper cable (conductor dia 0.5 mm).

b. Line side: RJ-45 onboard LAN/WAN 10/100/1000 ports

c. User port: Interface, minimum 2-port T1/E1 Multiflex Trunk Voice/WAN Interface Card.

d. Working on DC supply 48 V DC (Nominal) from S&T Battery Bank. For uniformity, the supply voltage of Router, LAN extender etc. in OFC huts shall be 48 V DC. For RTU it shall be 110 Vdc. SCADA vendor shall provide DC-DC converter as per the requirement.

e. Protection from surge on power supply port and communication port as the device is expected to work in 25 kV traction areas.

4.8 In case OFC is provided between Station Hut & Switching Post, LAN extender shall be replaced by suitable media converter on both ends (Ethernet on copper to Ethernet on fiber.

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SECTION 4

COMMUNICATION MEDIUM

4.0 Telecom Arrangement for High speed TCP/IP based SCADA

4.1 Purchaser shall provide redundant high speed communication medium between RCC & Station Hut along with STM-1 equipment connected in a ring. The purchaser shall provide all technical details of the communication media offered for SCADA. The communication link up to RTU shall be provided by the purchaser which shall not be redundant one.

4.2 Purchaser shall arrange communication medium between RCC and RTU. For this purpose existing OFC network shall be used between RCC & way station nearest to RTU locations. OFC has been laid along the track and terminated generally in OFC huts at way stations. These OFC huts house STM equipment which are provided in short haul configuration enabling extension of E1 to way stations. Presently the connectivity from OFC hut to RTU locations is on copper cable. If the connectivity between the S&T hut and switching posts is provided with OFC then single mode fiber cable with SC interface enabling communication up to 15 km should be used. Purchaser shall provide redundant communication medium between RCC & RTU along with STM-1 equipment connected in a ring. The purchaser shall provide all technical details of the communication media offered for SCADA.

4.3 The communication setup for implementing high speed communication is achieved through use of Router with an inbuilt 2-port E1 interface card, LAN extender etc. In this arrangement one E1 which shall be provided between stations to station. For network redundancy, additional E1 is utilized to form an OFC ring from station to station.

4.4 The telecom scheme is depicted in the diagram given below.

Telecom scheme comprises of Router with E1 interface, LAN extender etc. powered by available 48 Vdc in OFC Hut and 240 Vac in RCC.

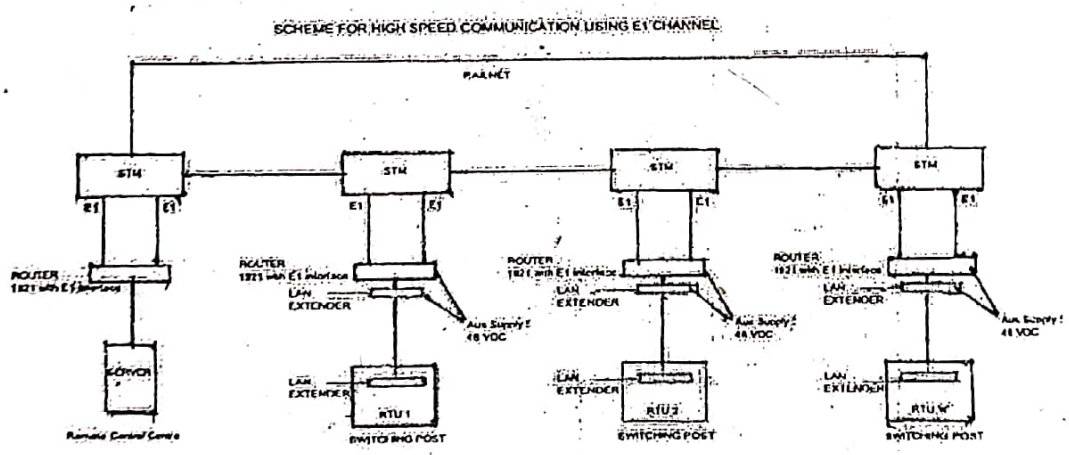


Figure: Telecom scheme for high speed SCADA based on TCP/IP communication

In this scheme availability of E1 channel is required at each OFC HUT at way stations and at Divisional HQ OFC Room. Purchaser/ Railway shall provide necessary E1 channel. The scheme comprises of communication equipment which are easily available from standard manufacturer in open market. Interfacing equipment at the post should be

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