


	हिन्दुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड Hindustan Petroleum Corporation Limited PIPELINES SBU	Doc No.	
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HINDUSTAN PETROLEUM CORPORATION LIMITED

Pipelines SBU

Telecom System Standard Operating Procedures

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Note: - As per the procedure for control of document procedure can be revised up to maximum 10 revisions and after 10th revision, new issue of the document with new issue number shall be issued to all the controlled copy -holders.

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1. Maintenance of Telecom System:

1.1 Purpose:

Maintenance of Telecom system for ensuring reliable and stable system by adopting detailed preventive maintenance procedures to be carried out by Telecom maintenance department.

1.2 Scope:

Responsibility of carrying out related Telecom maintenance activities among different sections of pipeline. Defining procedures for operations and maintenance of Telecom System

1.3 Responsibility:

Officer In-Charge-Telecom/Maintenance In-charge

1.4 Work Permit:

For maintenance activities at one of the main stations, take cold work permit from the respective control room. If work is to be carried out at MOV/SV stations, then information has to be provided to respective controlling locations and take cold work permit from respective controlling location.

1.5 AMC and OEM Details:

S.No	Purchase Order Number and dated	Party Name and Contact Details	P.O Expiry Date


1.6 OEM Contact Details :

S.No	Contact Person Name	Primary Contact No	Secondary Contact No

1.7 Usage:

Telecom system is used for transferring all the data and voice from one pipeline location to another using dedicated OFC network. All the main locations and SV locations are interconnected through telecom network.

1.8 Importance:

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Telecom system is used for transferring all the data and voice from one pipeline location to another using dedicated OFC network. All the main locations and SV locations are interconnected through telecom network. This is backbone of communication network. Data and voice communications across all the stations in the en-route of pipeline is carried out through telecom system.

1.9 Working Principle:


Optical Fiber Network is the physical layer and back bone of telecom system. This is the physical layer through which data and voice are transmitted. Multiplexing and De-Multiplexing techniques are used in this system.

1.10 Safety Precautions and PPE Usage:

Functioning of Telecom System is very critical for ensuring proper functioning of SCADA and LDS system. Following Safety Precautions and PPE to be used while handling SCADA equipment:

- Ensure that data and voice flow is not distributed.
- Ensure that atleast one path is healthy
- Proper Work Permit System to be followed.
- Intimation to be provided to control room prior start and after completion of activity.
- Laser lamp to human eyes .Its forbidden to take the end face in front of the eyes.
- Do not touch any conductor or unit without wearing the electrostatic band.
- Optical instrument must protected for strong electricity and lightening.
- Take care while bending the fiber it should not be more than 38 mm
- Do not remove the fiber connector unnecessarily .Contamination must be avoided at the end of the fiber connector.
- Proper grounding must be provided which will protect the system from equipment safety and anti-interference. It will also protect the humans.
- There must be a dedicated earth pit for telecom systems.

1.11 Equipment: This system consists of SDH/PDH, CCTV, VCS equipment, EPABX, PIDS.

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2. SOP for Maintenance of CCTV System

2.1 Purpose:

To provide guidelines for maintenance of CCTV System.

2.2 Scope:

Scope of work includes maintenance of CCTV System provided at the location.

2.3 Responsibility:

Officer In-Charge-Telecom/Maintenance In-charge

2.4 References:

NIC CODE 61102 - Maintenance of Telecom network
 OISD-STD- 141: Design and Construction Requirements For Cross Country Hydrocarbon Pipelines

2.5 Usage:

In Cross country pipeline, CCTV equipment are used to observe parts of a process that are remote from a control room. CCTV systems may operate continuously or only as required to monitor a particular event.

2.6 Importance:


CCTV are deployed in Network to meet safety and surveillance requirements.

2.7 Location of Installation:

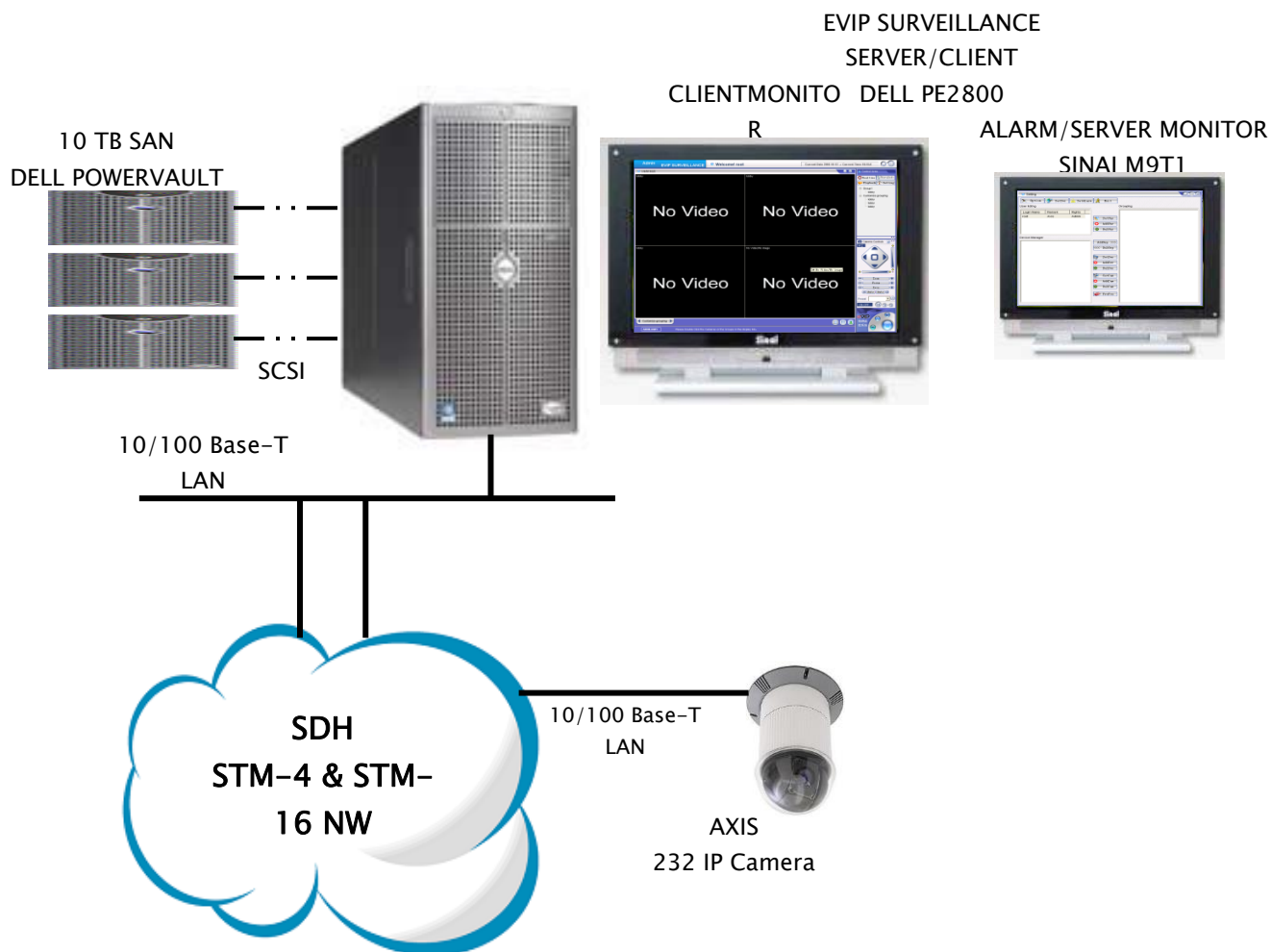
CCTVs are installed in Process area, SV stations, pump houses and other places as per the location requirement.


2.8 Parts:

CCTV system consists of CCTV cameras, Servers, Storages, Media convertor, Lan cable, Switches and OFC cable.

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2.9 Block Diagram for typical CCTV system:



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2.10 Monthly Maintenance of CCTV System:

- 2.10.1 Take cold work permit from shift in charge
- 2.10.2 Open the power vault storage panel and front cover of CPU.
- 2.10.3 Clean the air filters of the panel and ensure no dust is settled on the power vaults and the CPU.
- 2.10.4 Current CCTV cameras are IP based so ping all CCTV cameras from the server.
- 2.10.5 Open record server window on the server and check if the videos are being recorded as per the settings and old, data is being deleted automatically as per the defined period. If required restart the record server if recording is not proper.
- 2.10.6 Open Internet explorer and open each camera location under the jurisdiction as per the following IP address and check if the video is rightly available.
- 2.10.7 Ping all the CCTV servers as per the IP address list of respective locations.
- 2.10.8 Check the status of all hard drives. Amber/red indication on the hard disk indicates a fault in the particular drive. In case of any alarm login to the open manage server administration and check the status of the particular drive. In case the drive is degraded then start rebuild of the drive.
To rebuild a drive
 - Login into OMSA with administrator username and password
 - Go to storage and click on the channel showing error symbol
 - Browse down the tree to reach to the degraded hard disk
 - Select rebuild from the dropdown menu for the specific drive
- 2.10.9 Login to the open manage server administration as server administrator using the authentic username and password.
- 2.10.10 Click on the link for each module and check for any alarms.

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2.10.11 In case of any severe or audible persisting alarm take assistance from Dell/HP/IBM online service support or the vendor for further assistance.

2.10.12 Record the details of replacement of parts also in history card.

2.10.13 After completion of the job close the work permit

2.11 Trouble Shooting of CCTV System:

ISSUE 1: CCTV camera of main location not reporting in client screen


Check the ping of IP address of those location cameras from CCTV server

If Ping is coming then network is through then check the cameras view by keeping ip address in browser

If it is viewing properly in browser then issue is with CCTV client software. Contact officer in-charge for rectification

If ping is not coming then check the LAN cable connections between CCTV switch and camera cable (for short distance cameras). For long distance cameras check the LAN connection between CCTV switch and OFC convertor. If connections are not ok then rectify it

If connection is through then check the OFC connections and convertor status (for long distance cameras. For all cameras check the ping at camera end by using laptop. If ping is not coming then do the same by replacing the cable. After replacing the cable if it is working cable might be faulty. Hence replace it. If Ping is not coming from camera, then camera might be faulty and send the same to OEM/AMC vendor for repair or rectification.

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ISSUE 2: Camera remote location is not reporting to main CCTV server:

Check whether only one camera of location is not working or all cameras of that location are not working

If all cameras of particular location are not working. Then check whether MCBs of those CCTV is Telecom panel must be ON. If they are off then make it on. If it is again tripping then for identifying the issue officer in charge has to reach that location.

Issue still persists after making MCBs on. Then check the connectivity between main CCTV server and that location node. If connectivity is through then issue might be with CCTV client software. Contact officer in-charge for rectification.

If particular camera is not working check the ping of camera from server, if ping is coming then issue might be with CCTV client software. Contact officer incharge for rectification. If ping is not available then check whether MCB of that particular ON or not if not make it ON.

If MCB is tripping again then for checking the issue office in charge has to reach that location. If camera is not reporting after making MCB ON, then check the Ping of camera using cable which is available I downstream of SPD/barrier. If ping is not available then check the same at upstream of SPD/barrier. If ping is available hen SPD/barrier became faulty then replace it. If ping is not available in upstream of barrier also then check the ping directly at camera end. If ping is coming at camera then LAN cable from camera to SPD/barrier is faulty then carry out replacement or carry out crimping of cable and check the same using LAN tester. If Ping is not coming at camera end then camera might be faulty same to OEM/AMC vendor for repair or rectification.

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2.12 Maintenance Format for CCTV System:

Location :
TELECOM

Department:

Month:
Monthly


Frequency:

Doc

No:

ISF/TEL/01

S l . N o .	Instructions	Observation	Remarks
1	Cleaning of the rack cabinet and respective power vault, server units & fan		
2	Check the ventilation and fan of rack cabinet system.		
3	Check status of all hard disks		
4	Check if all the SCSI connectors are properly connected & well tight		
5	Check for running of record server & recording in resp. folder as defined for monitoring.		
6	Functioning & connectivity of all CCTV cameras in resp. jurisdiction.		

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7	Inter connectivity between CCTV servers		
8	Check for alarms in CCTV server		
9	Check the tightness of various connections in ACDB		

Prepared by

Signature :

Name :

Designation :

Date :

Approved By

Signature :

Name :

Designation :

Date :

2.13 RELEVANT RECORDS:

Maintenance of CCTV System: ISF/TEL/01

2.14 Frequency:

Maintenance of CCTV System frequency - Monthly

3. SOP for Maintenance of EPABX System

3.1 Purpose:

To provide guidelines for maintenance of EPABX System.

3.2 Scope:

Scope of work includes maintenance of EPABX System provided at the location.

3.3 Responsibility:


Officer In-Charge-Telecom/Maintenance In-charge

3.4 References:

NIC CODE 61102 - Maintenance of Telecom network

OISD-STD- 141: Design and Construction Requirements For Cross Country Hydrocarbon Pipelines

3.5 Usage:

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EPABX is microprocessor based, 100% Non-Blocking, ISDN Native using Pulse code Modulation (PCM) and Time division Multiplexing (TDM) Techniques conforming to ITU-T recommendations. It supports simultaneous voice, Data, Image and Text Transmission without any degradation of services. The EPABX support E&M (2W or 4W), digital tie lines & 2MB PCM link for networking applications. It is equipped with storage devices, which will save the data, as well as software required for its operation.

3.6 Importance:

EPABX system acts as personal telephone exchange for each location. All Locations phone number mapping are done in EPABX and all locations EPABX are connected to each other with the help of SDH over OFC.

3.7 Location of Installation:

There are two types of Phone categories available Analog and IP based. These Phones are installed at Officer desks in administration building, Control Rooms and Acoustic based Phones are installed in Process area.

3.8 Parts:

The following cards are used in our EPABX system:

EZ32 – ANALOG EXTENSION

NDDI – ANALOG TRUNK INTERFACE

NPRA – E1 OR PRI CONNECTIVITY

INTIP-3 – VOIP CHANNELS FOR VOIP COMMUNICATIONS

UA 32 – DIGITAL EXTENSION

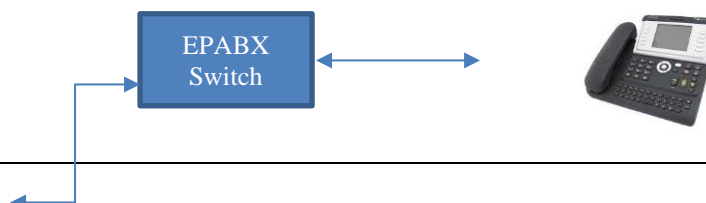
GPA – VOICE GUIDES


CPU- PROCESSOR

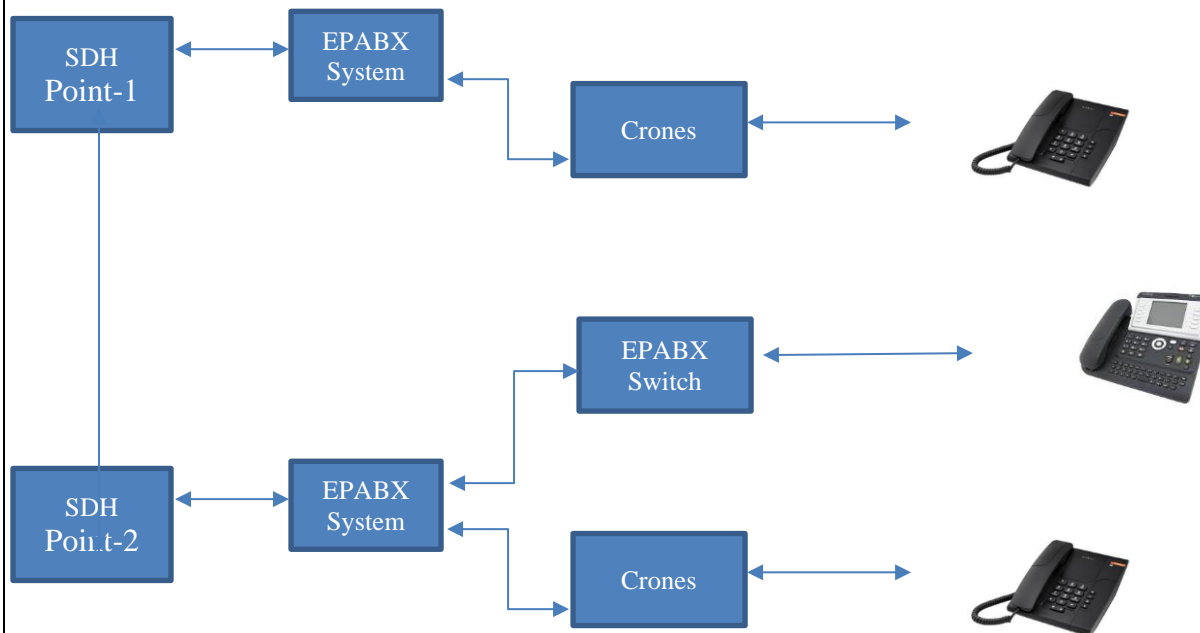
Along with that 2 types of Phones are available at locations:

- Analog Phones: It is further divided in two types i.e. Normal Phones sets and Acoustic Phone Sets.
- IP Based Phones: It is further divided in two types i.e. Normal IP Based Phones sets and Video Calling Phones.

3.9 Block Diagram:



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3.10.Monthly Maintenance of EPABX System

3.10.1 Go to start menu and run the following command

Telnet <ip address of EPABX>

For Eg:

Login the EPABX with username: mtcl and Password: mtcl

3.10.2 The following command to check the status of all links and for connectivity to the locations directly connected to the EPBAX

Suproutage

3.10.3 Type the following command to check the status of each card

Config 0

All cards should be in service.

3.10.4 In case any card is out of service note down the slot number of the card as shown in the telnet window and run the following command to check the current alarms in the system

Incvisu

3.10.5 In case of any alarms reset the particular card with the following command

RSTCPL 0 CARDSLOTNUMBER

If the alarm persists, replace the card.

3.11 Procedure for planned shutdown of EPABX:

Login thru telnet. Then, type the command “*SHUTDOWN –IH NOW*”.

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3.12 Procedure for planned rebooting of system:

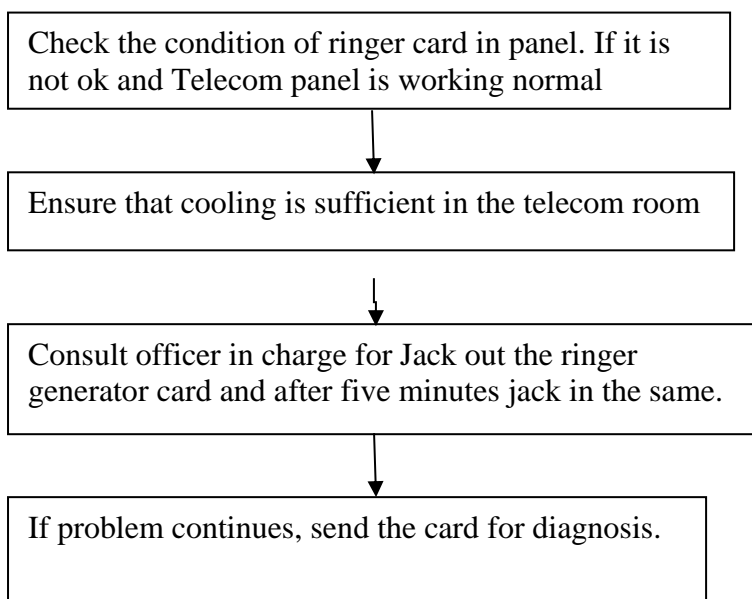
Login thru telnet. Then, type the command “REBOOT” or “SHUTDOWN –IR NOW”.

3.13 Procedure For soft reset of a particular card

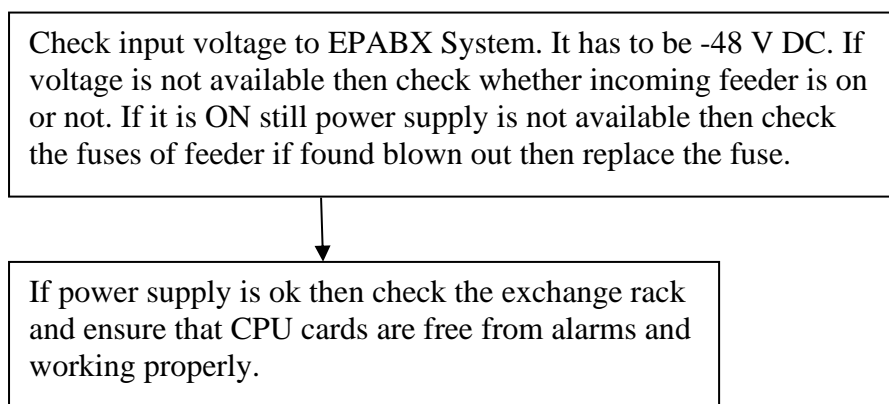
Login thru telnet. Then, type the command “RSTCPL 0 CARDSLOTNUMBER”

3.14 Troubleshooting procedure for EPABX related Issues:

ISSUE 1: Phone not ringing at SV locations (without EPABX)



ISSUE 2: Alarm in EPABX :



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If alarms are found contact officer in charge for rectification of issue.

3.15 Maintenance Format for EPABX System:

Location :
TELECOM


Department:

Month:
Monthly

Frequency:

Doc No: ISF/TEL/02

क्र मां क S l . N o .	निर्देश Instructions	परिणाम Observation	टिप्पणी Remarks
1	Cleaning of the rack cabinet and respective rack units & fan		

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2	Check the ventilation and fan of rack cabinet system.		
3	Check status of all Cards for alarms.		
4	Check if all the connectors are in perfect operating conditions.		
5	Check battery voltage and record.		
6	Check the tightness of various connections in DCDB		
7	Check the functioning of telephone of acoustic booths(s) and check the functioning of hooter of acoustic booth(s)		
8	Configuration backup of CPU to be taken.		

Prepared by

Signature :

Name :

Designation :

Date :

Approved By

Signature :

Name :

Designation :

Date :

3.16 RELEVANT RECORDS:

Maintenance of EPABX System: ISF/TEL/02

3.17 Frequency :

Maintenance of EPABX System frequency - Monthly


4. SOP For Maintenance of OFC System :

4.0 Purpose:

To provide guidelines for maintenance of OFC System.

4.1 Scope:

Scope of work includes maintenance of OFC System provided at the location.

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4.2 Responsibility:

Officer In-Charge-Telecom/Maintenance In-charge

4.3 References:

NIC CODE 61102 - Maintenance of Telecom network

OISD-STD- 141: Design and Construction Requirements For Cross Country Hydrocarbon Pipelines

4.4 Usage:

Fiber optic cables have a core that carries light to transmit data. This allows fiber optic cables to carry signals at speeds that are only about 31 percent slower than the speed of light—faster than Cat5 or Cat6 copper cables.

4.5 Importance:

OFC Network is the Backbone on which whole Telecom system's data transmission is being done.

4.6 Location of Installation:


OFC cable is laid in ROU along with length of pipeline from SDH node to node for data transmission of SCADA, PIDS and All Telecom Equipment.

4.7 Parts:

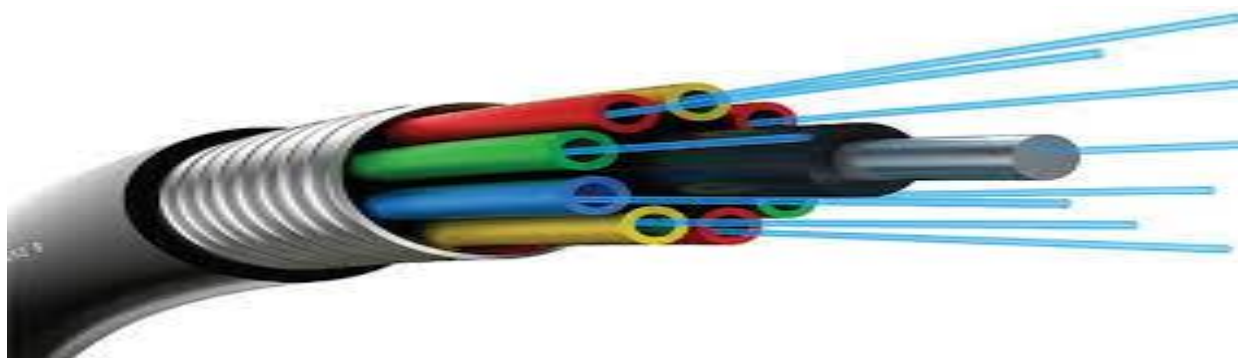
We have generally 12 core, single mode armoured OFC cable laid with our pipelines for data transmission from node to node.

The colour coding of the fibers are as follows:

- A1 blue
- A2 orange
- A3 green
- A4 brown
- A5 slate
- A6 white
- B1 Red
- B2 Black
- B3 Yellow
- B4 Violet

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B5 Pink
B6 Aqua



4.8 Maintenance & testing of OFC links:


4.8.1 List of Measuring equipments & accessories are given below:

- 1.8.1.1) Optical Power meter - 2 Nos.
- 1.8.1.2) Optical laser source - 2 Nos.
- 1.8.1.3) Optical patch cord with connectors - 2 Nos.
- 1.8.1.4) Optical Time domain reflectometer (OTDR) - 2 Nos.
- 1.8.1.5) Fiber cleaning kit (Solvent + buds + tissues) - 2 Sets.

4.8.2 Follow the Safety precautions given below:

- 4.8.2.1) Never look directly into the laser source when it is active, as it may damage eyesight.
- 4.8.2.2) Never touch the face of the fiber connectors with bare hands. Also do not bend the patch cord while using it.

4.8.3 Maintenance engineers with one set each of Optical Laser source, Optical power meter OTDR, patch cord with cleaning kit are to be positioned at station A and B. Constant communication between stations A & B is maintained on the Engineer's Order Wire phone (EOW) provided at the side of the telecom rack.

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4.8.4 At station A & B: Clean the fiber connectors of the patch cords, Optical Laser sources, Optical power meters, OTDRs using the solvent cleaners and dry it properly with buds & tissues. Insert one end of the patch cord connector (male) into the Optical Laser Source connector (female). Tighten the connectors slowly. Do not over tighten it.

Note : for any two particular stations only the fibers being dropped at the location ll be checked.

For STM 1 stations only fibers on STM 1 ll be available for checking i.e. from A1 to A6.

4.8.5 Remove the caps of the spare fiber connectors at both the stations and clean the same.

4.8.6 At Station A & B: Insert the second end of the patch cord connector into the Optical power meter.

4.8.7 At Station A & B: Switch ‘ON’ the Optical power meter and the Optical laser source.

4.8.8 At station A & B: Record the steady readings being displayed on the Optical power meters under the column ‘PT-dbm’. Switch OFF the Optical power meter and the Optical laser source.

4.8.9 At station A: Remove the connector of the patch cord from the Optical power meter and connect it to the spare connector.

4.8.10 At station B: Remove the connector of the patch cord from the Laser source and connect it to the sl.no.3 of the fiber connectors at the rack end i.e., the Optical power meter is connected to the respective fiber.

4.8.11 Switch ON the Optical power Meter at station B and the laser source at station A. The reading that is displayed on the Optical power meter at station B is recorded under the column ‘PR – dbm’ of station A against the respective fiber.


4.8.12 Repeat step (10) and record the readings against other spare fibers under station A.

4.8.13 The live fiber shall also be tested by shifting the communication to spare fibers.


Note : Never put on the laser on active fiber i.e. laser is ON.

4.8.14 At station A& B: Switch OFF the Optical laser source and the Optical power meter.

4.8.15 At station A: Remove the connector of the patch cord from the Optical laser source and reconnect it to the Optical power meter i.e., the Optical power meter is connected.

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- 4.8.16 At station B: Remove the connector of the patch cord from the Optical power meter and reconnect it to the Optical Laser source i.e., the Optical Laser source is connected to the Blue fiber.
- 4.8.17 At station A & B: Switch ON the Optical power meter and the Optical Laser source.
- 4.8.18 Record the steady reading being displayed on the Optical power meter at station A under the column 'PR-dbm' against Blue fiber for the station B.
- 4.8.19 By changing the connectors to different fibers one by one at station A & B, the readings are recorded against the balance fibers for the station B.
- 4.8.20 At station A & B: Switch OFF the Optical Power meter and the Optical Laser Source.
- 4.8.21 The loss 'Loss-db' for any fiber is obtained by subtracting the reading available under 'PR-dbm' from 'PT-dbm' and the same is recorded under the column 'Loss-db' against that fiber. The steps are repeated for all the balance fibers also. The average loss as per the Optical power meter for the fibers obtained by calculating is recorded under 'P meter-A loss'.
- 4.8.22 Record last year's fiber 'P meter A losses' against 'Loss-db-Pr' for comparisons and necessary action.
- 4.8.23 At station A & B: Remove the connectors from the Optical Power meter and the Optical Laser source and reconnect it to the OTDRs. Follow the Manual for settings of the OTDR.
- 4.8.24 At station A & B: Switch ON the OTDR and the Laser source.
- 4.8.25 At station A & B: Take print outs of the fiber traces for all the six fibers. The traces will show the nature of fault and the location.
- 4.8.26 Connectors caps on all the spare fibers at the rack end, Optical power meter, Optical laser source, Patch cords and OTDRs are carefully put back.
- 4.8.27 After completing the above activities at stations A & B, the team moves to the next OFC Link i.e., Station B & C. All the above steps are repeated again till all the OFC links are completed.

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4.9 Troubleshooting procedure for OFC related Issued:

ISSUE 1: OFC cut at a location in ROU

Check in NMS the node status for communication. Check Tx, Rx powers of nodes if abnormal powers are displayed (around -99 dB). Then confirm the same in adjacent node of the location. CCTV cameras of that location will not report to server.



If alarm is present in Optical cards, OTDR to be carried out from FTC to know the optical distance of OFC cut. Line up the OFC jointing team for carrying out checking using OTDR.



After OFC jointing is completed, repeat OTDR for all the fiber to ascertain the loss at the location of cut, If loss is more than 0.1 dB, re- splicing of fiber to be done.

ISSUE 2: Identification of Points having abnormal losses.


OFC link test to be carried out via OTDR and trace to be checked for major losses (>0.25 dB/km) and locations to be recorded. Check in records for nearest jointing points at these locations



If earlier joints are nearby then remove all joints and replace the same with single run OFC cable. This will eliminate the joints.



After OFC jointing is completed, repeat OTDR for all the fiber to ascertain the loss at the location of cut, If loss is more than 0.1 dB, re- splicing of fiber to be done.

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A									
6									
B			PT dbm		PR dbm		PT dbm		PR dbm
1									
Before Link test									
PT-Transmit power,			PR-Receive power,		Loss= PT-PR,				
After Link test									
Average loss as per power meter = (loss A + lossB) / 2									
B									
3									
B									
4									
B									
5									
B									
6									

Prepared by

Signature :

Name :

Designation :

Date :

Approved By

Signature :

Name :

Designation :

Date :

4.11 RELEVANT RECORDS:

Maintenance of OFC System: ISF/TEL/03

4.12 Frequency :

Maintenance of OFC System frequency - For Live Fibers Quarterly and for Spare Fibers as and when required basis on loss

5. SOP For Maintenance of SDH System:

5.0 Purpose:


To provide guidelines for maintenance of SDH System.

5.1 Scope:

Scope of work includes maintenance of SDH System provided at the location.

5.2 Responsibility:

Officer In-Charge-Telecom/Maintenance In-charge

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5.3 References:

NIC CODE 61102 - Maintenance of Telecom network
OISD-STD- 141: Design and Construction Requirements For Cross Country Hydrocarbon Pipelines

5.4 Usage:

The acronym SDH stands for Synchronous Digital Hierarchy and refers to a multiplex technology used in telecommunications. SDH allows data streams with low bit rates to be combined into high-rate data streams.


5.5 Importance:

Synchronous digital hierarchy (SDH) is standardized protocols that transfer multiple digital bit streams synchronously over optical fiber using lasers or highly coherent light from light-emitting diodes (LEDs). It is used as multiplexer and De-multiplexer for various facilities like VCS, CCTVs, Phones data, PIDS data etc for transmission over OFC cable.

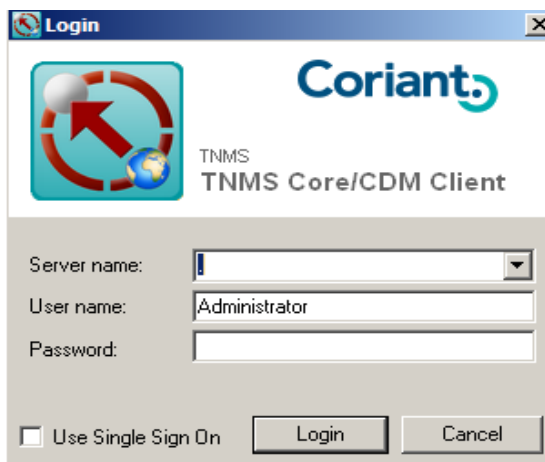
5.6 Location of Installation:

SDH system is installed at each Telecom node, i.e. each location and SV stations for data communication over OFC.

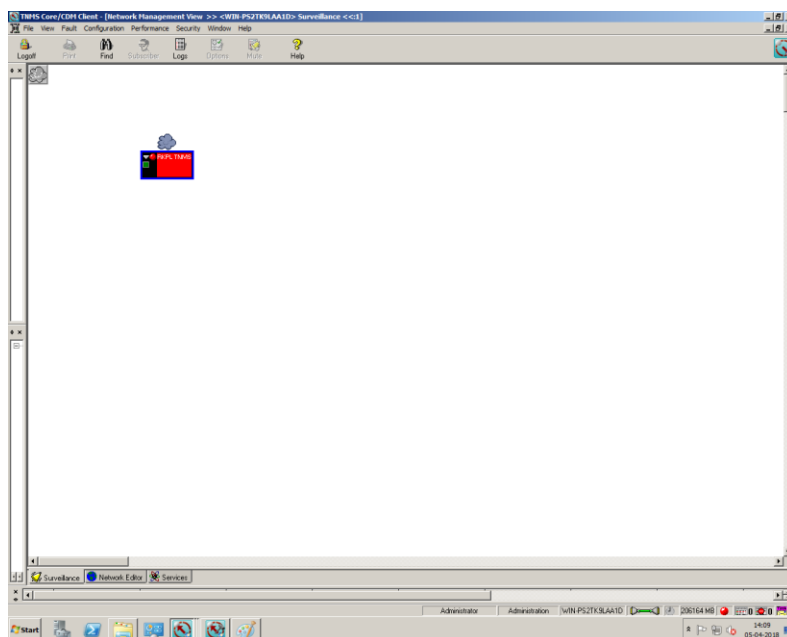
5.7 Block Diagram for typical SDH system:

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5.8.2.2 Run the TNMS core client, login.
Double click the TNMS core client on the desktop, put in the user name & password, then click OK.



5.8.2.3 Right Click on the Pipeline (like RKPL) map icon, open, check the status of NE, and observe NE Status.

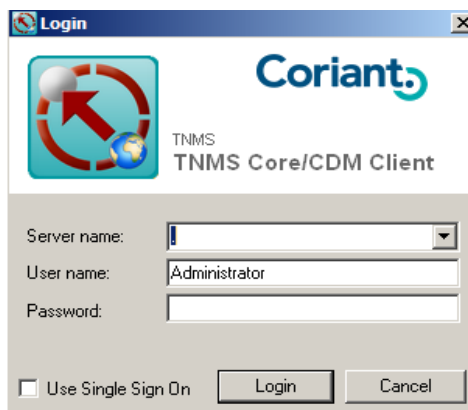


5.8.3 Procedure 3: to check status of all alarms

- 5.8.3.1 Power on the NMS System. Login the sever.
- 5.8.3.2 Run the TNMS core client, login.

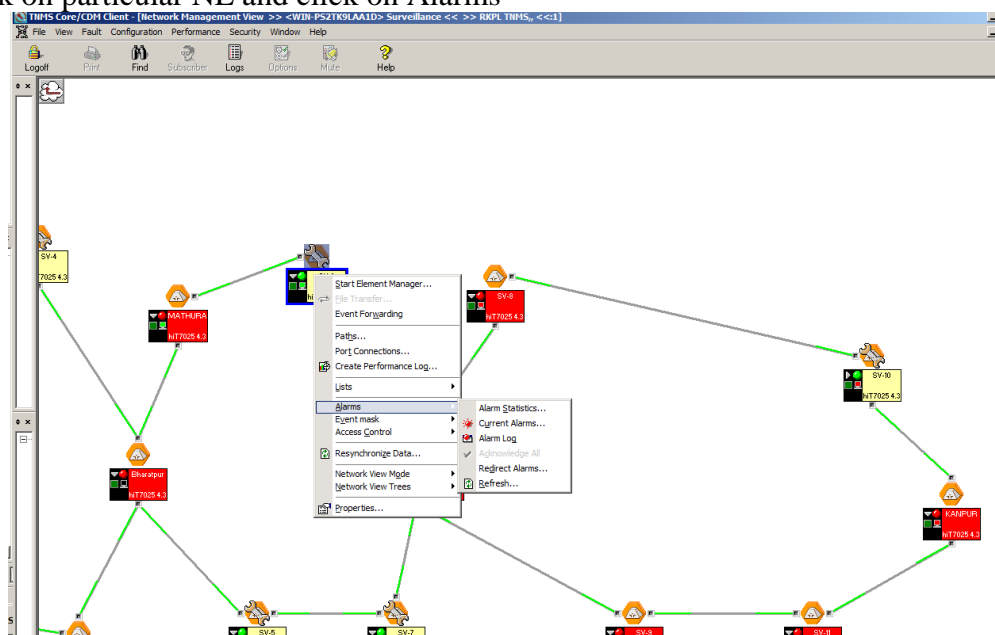
	<p>हिन्दुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड Hindustan Petroleum Corporation Limited PIPELINES SBU</p>	Doc No.	
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Double click the TNMS core client on the desktop, put in the user name & password, then click OK.




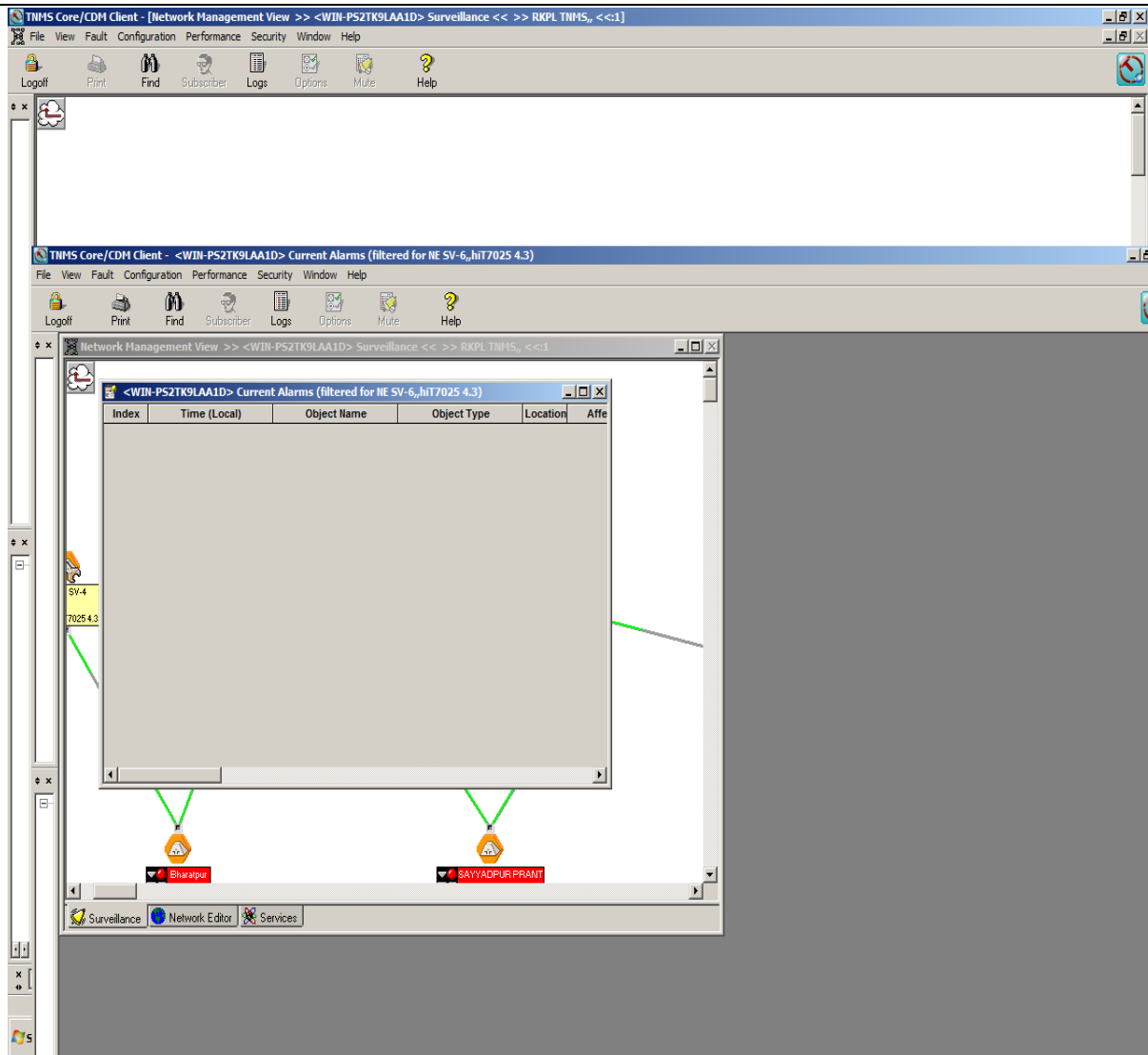
5.8.3.3 For Checking Alarm:

Right click on particular NE and click on Alarms



Click the ALARM for the selected node in TNMS Core client [Network Management] and check current alarms

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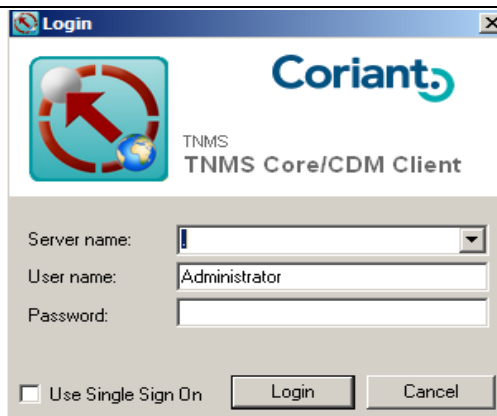
5.8.4 Procedure 4: To check for communication of all SCE card and SCE card Status

5.8.4.1 Power on the NMS System. Login the sever.

5.8.4.2 Run the TNMS core client, login.

Double click the TNMS core client on the desktop, put in the user name & password, then click OK.


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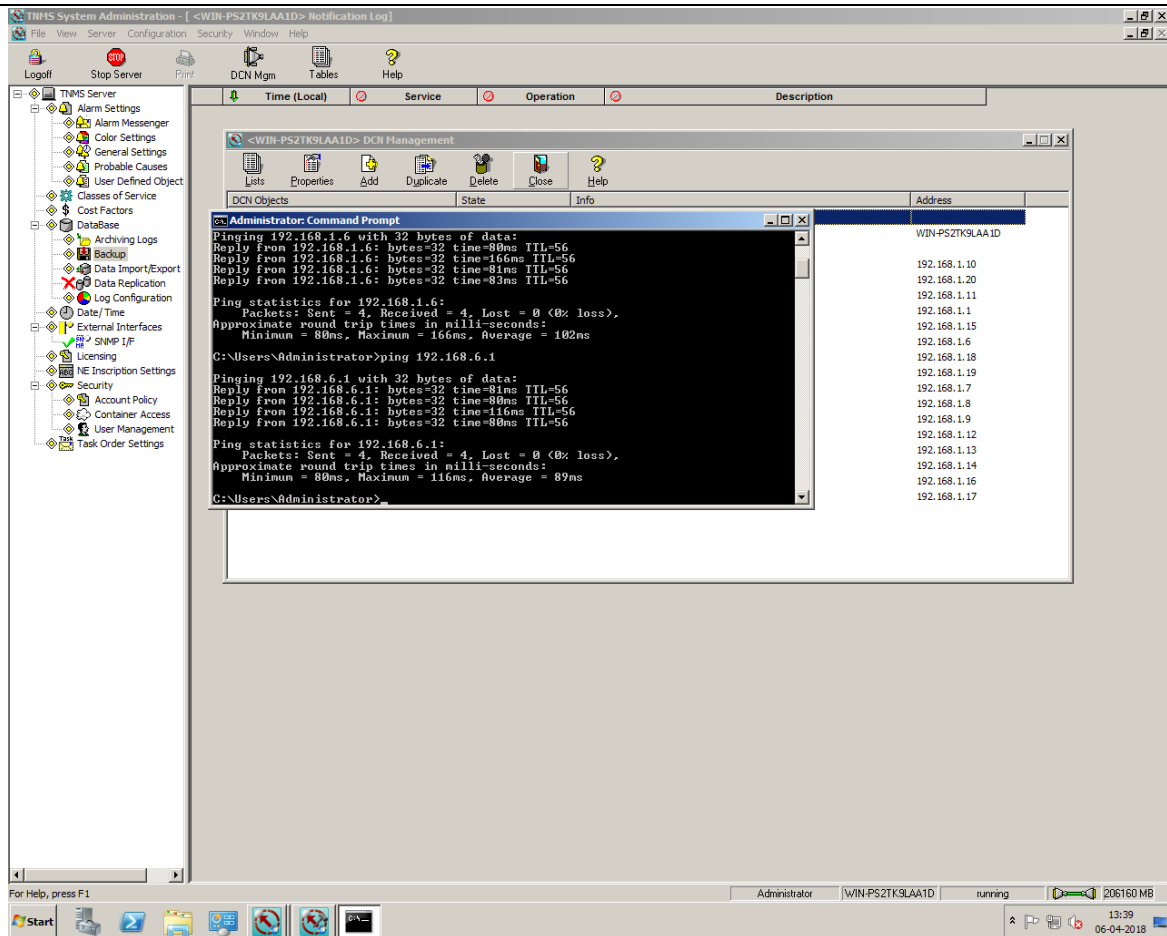


5.8.4.3. IP address of all SDH nodes to be noted as mentioned below.

Sr. No.	Station Name	Node IP	Management IP
1			
2			
3			
4			
5			

5.8.4.4 Go to command prompt and ping the node ip and management ip for the status of the SCE card status.

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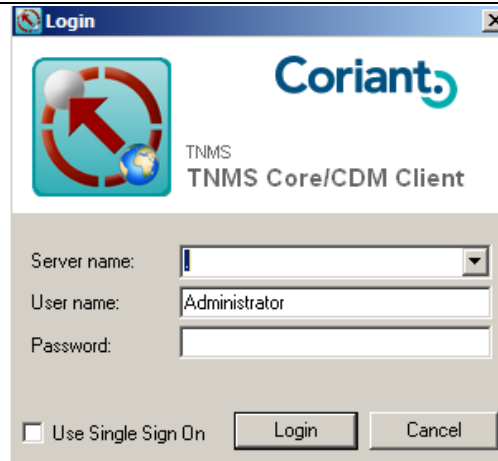
5.8.5 Procedure 5: Take Configuration back up

5.8.5.1 Power on the NMS System. Login the sever.


5.8.5.2 Run the TNMS core client, login.

Double click the TNMS core client on the desktop, put in the user name & password, then click OK.

	<p>हिन्दुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड Hindustan Petroleum Corporation Limited PIPELINES SBU</p>	Doc No.	
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Login

 **Coriant**

TNMS
TNMS Core/CDM Client

Server name:

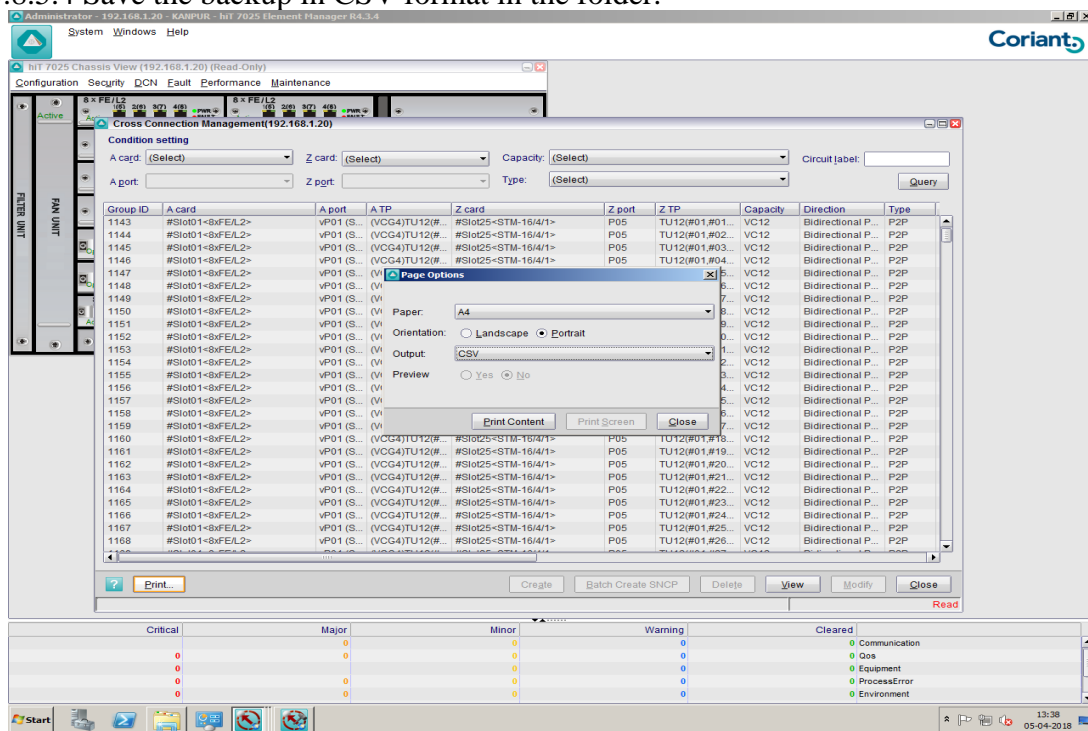
User name:

Password:

☐ Use Single Sign On

5.8.5.3 Click on Configuration>Cross Connection Management>Query>Print>Output in CSV format.

5.8.5.4 Save the backup in CSV format in the folder.



Administrator - 192.168.1.20 - KANPUR - hit 7025 Element Manager R4.3.4

System Windows Help

Configuration Security DCN Fault Performance Maintenance

Active

Cross Connection Management(192.168.1.20)

Condition setting

A card: (Select) Z card: (Select) Capacity: (Select) Circuit label:

A port: (Select) Z port: (Select) Type: (Select)


Group ID	A card	A port	A TP	Z card	Z port	Z TP	Capacity	Direction	Type
1143	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#01...	VC12	Bidirectional P...	P2P
1144	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#02...	VC12	Bidirectional P...	P2P
1145	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#03...	VC12	Bidirectional P...	P2P
1146	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#04...	VC12	Bidirectional P...	P2P
1147	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#05...	VC12	Bidirectional P...	P2P
1148	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#06...	VC12	Bidirectional P...	P2P
1149	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#07...	VC12	Bidirectional P...	P2P
1150	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#08...	VC12	Bidirectional P...	P2P
1151	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#09...	VC12	Bidirectional P...	P2P
1152	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#10...	VC12	Bidirectional P...	P2P
1153	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#11...	VC12	Bidirectional P...	P2P
1154	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#12...	VC12	Bidirectional P...	P2P
1155	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#13...	VC12	Bidirectional P...	P2P
1156	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#14...	VC12	Bidirectional P...	P2P
1157	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#15...	VC12	Bidirectional P...	P2P
1158	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#16...	VC12	Bidirectional P...	P2P
1159	#Slot01-8xFE/L2>	VP01 (S...	(V) ...	#Slot25-STM-16/4/1>	P05	TU12/#01.#17...	VC12	Bidirectional P...	P2P
1160	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#18...	VC12	Bidirectional P...	P2P
1161	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#19...	VC12	Bidirectional P...	P2P
1162	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#20...	VC12	Bidirectional P...	P2P
1163	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#21...	VC12	Bidirectional P...	P2P
1164	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#22...	VC12	Bidirectional P...	P2P
1165	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#23...	VC12	Bidirectional P...	P2P
1166	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#24...	VC12	Bidirectional P...	P2P
1167	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#25...	VC12	Bidirectional P...	P2P
1168	#Slot01-8xFE/L2>	VP01 (S...	(VCG4)TU12(R...	#Slot25-STM-16/4/1>	P05	TU12/#01.#26...	VC12	Bidirectional P...	P2P

Read

Critical	Major	Minor	Warning	Cleared
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

Start

13:38
05-04-2018

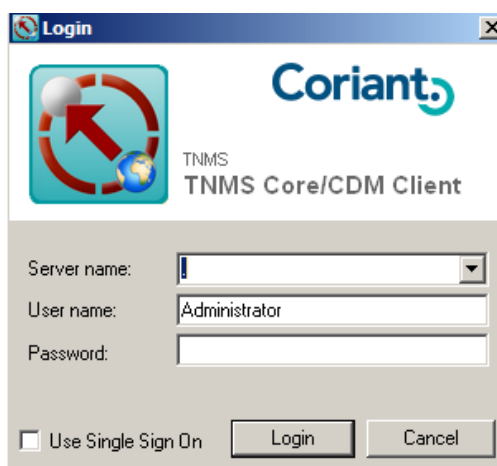
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5.8.6 Procedure 6: To check CONNECTIVITY

5.8.6.1 Power on the NMS System. Login the sever.

5.8.6.2 Run the TNMS core client, login.

Double click the TNMS core client on the desktop, put in the user name & password, then click OK.




5.8.6.3 Click on DCN management.

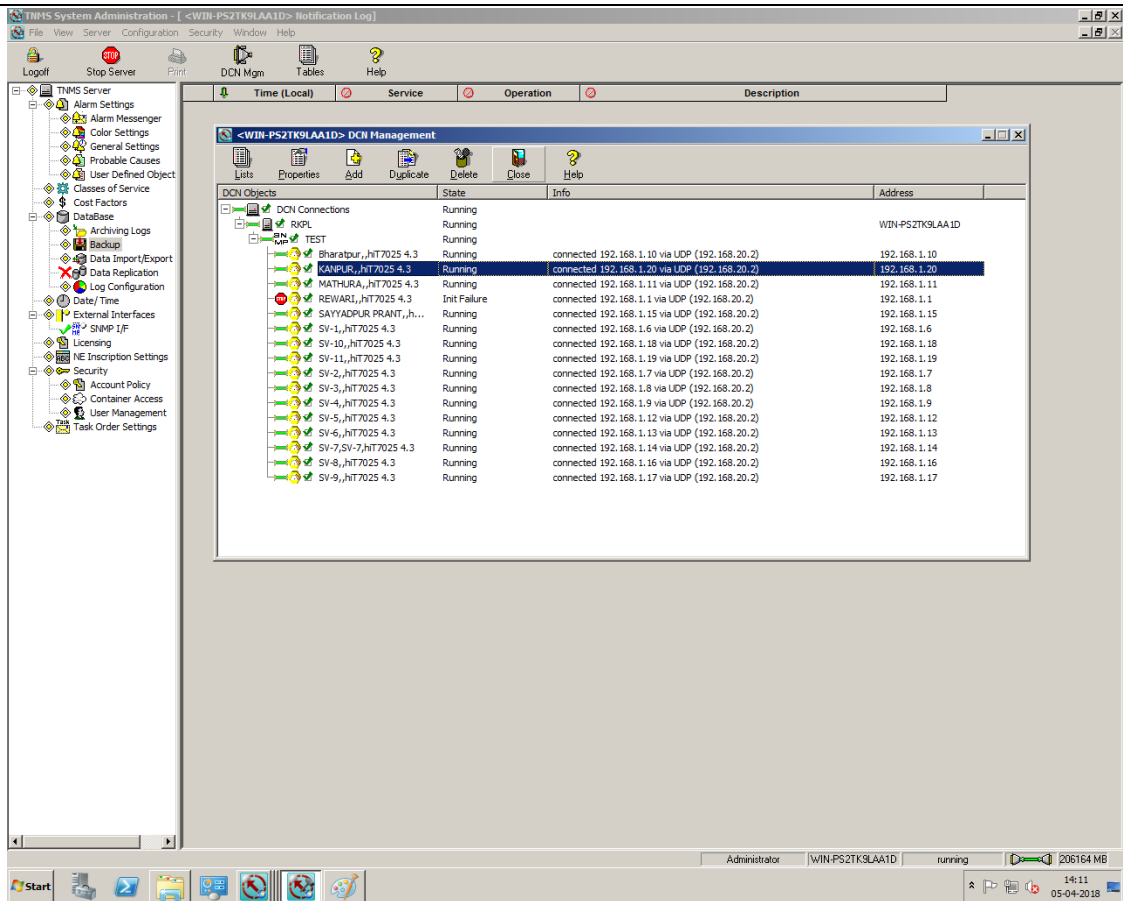
5.8.6.4 Click on DCN objects> ----->Test.

5.8.6.5 In the right the connectivity is shown as green if there are no optical issues or node down issues. If the connectivity is shown as red then check go to Logical map to find out the issue.


5.8.6.5.1 If the optical connectivity between two station fails then the path which in case of normal situation is green will be shown as red.

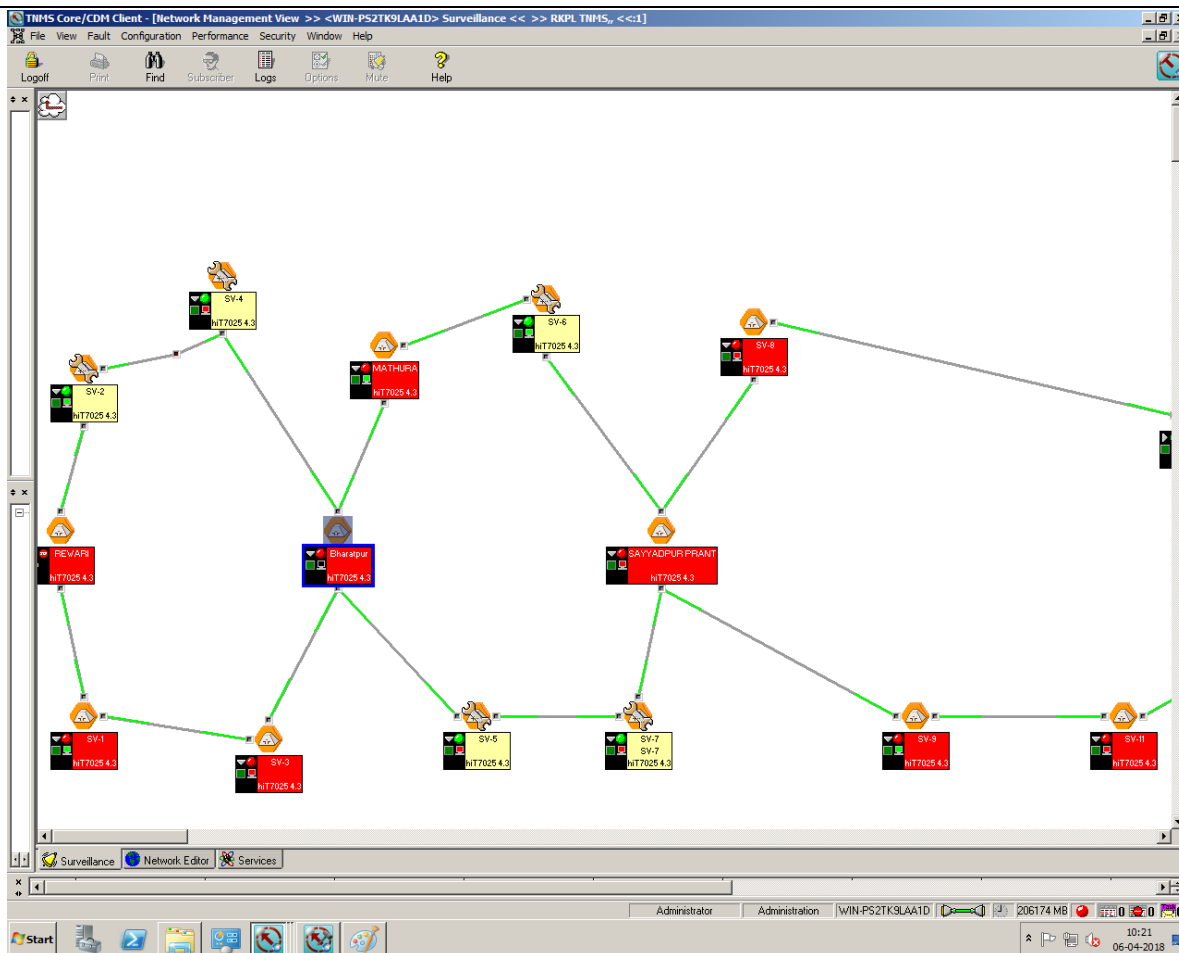
5.8.5.5.2 If the node is power down then there will be Red Cross on that particular node.

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DCN Management

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Logical Map

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5.9 Troubleshooting procedure for SDH/Telecom Card related Issued:

ISSUE 1: ALARM IN OPTICAL CARD

Check physical LED indications at OFC terminal under normal conditions both LEDs of Tx and Rx has to be green. If color is amber then check whether it is in Tx or Rx. If it is in Tx then issue is with local panel. If Rx is amber then issue is with OFC or data not receiving from previous location.



Check node status in NMS. Check for Tx, Rx powers in NMS. If receiving power is showing abnormal value(around -99 dB) . Check for alarms in that node and check for node status of adjacent nodes.




If alarm on next node is appearing Check for optical link healthiness i.e. OFC cut, losses etc. by doing OTDR.



For checking healthiness of OFC cable use OTDR, if OTDR results depict that there is OFC cut then OFC jointing team to be lined up for rectification.



If instead of OFC cut, heavy losses observed, Zero dB connector to be checked/replaced and cleaning of OFC termination to be done with isopropyl alcohol.

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OTDR process to be repeated and alarms to be checked after reconnection.


Still OFC losses are observed then OFC rectification team to be lined up for reducing Optical losses.

ISSUE 2: No alarm in NMS/cards but location data not updating in SCADA

Check the LAN connection between SCADA and Telecom System. If it is not ok then check the cable and replace the same if it is faulty

If LAN connection is ok still problem is persisting then carry out soft reset of node from NMS.

If problem still persists then hard reset to be carried out after taking permission from office In-charge.

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5.10 Maintenance format for SDH system:

Location :
TELECOM

Department:

Month:
Monthly


Frequency:

Doc No: ISF/TEL/04

क्रमांक Sl. No.	निर्देश Instructions	परिणाम Observation	टिप्पणी Remarks
1	Check NMS login		
2	Check the UPS power supply (Neutral-earth<5V)		
3	Check for the NE's status		
4	Check for Current alarms list		
5	Check for communication of all EMU card and EMU card Status.		
6	Configuration back up is taken		
7	Check for various LAN connectivity		
8	Cleaning of all racks including fan unit		
9	Check the tightness of various connections in DCDB		

Prepared by
Signature :
Name :

Approved By
Signature :
Name :

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Designation :

Date :

Designation :

Date :

5.11 RELEVANT RECORDS:

Maintenance of SDH System: ISF/TEL/04

5.12 Frequency:

Maintenance of SDH System frequency - Monthly

6. SOP For Maintenance of VCS System:

6.0 Purpose:

To provide guidelines for maintenance of VCS System.

6.1 Scope:

Scope of work includes maintenance of VCS System provided at the location.

6.2 Responsibility:

Officer In-Charge-Telecom/Maintenance In-charge

6.3 References:

NIC CODE 61102 - Maintenance of Telecom network


OISD-STD- 141: Design and Construction Requirements For Cross Country Hydrocarbon Pipelines

6.4 Usage:

Video conferencing is a technology that allows users in different locations to hold face-to-face meetings without having to move to a single location together.

6.5 Importance:

Video conferencing boosts productivity, saves time, reduces travel expenses, and overall promotes collaboration. The advantage of video conferencing is the ability to facilitate all of those benefits without requiring constant travel for face-to-face communication.

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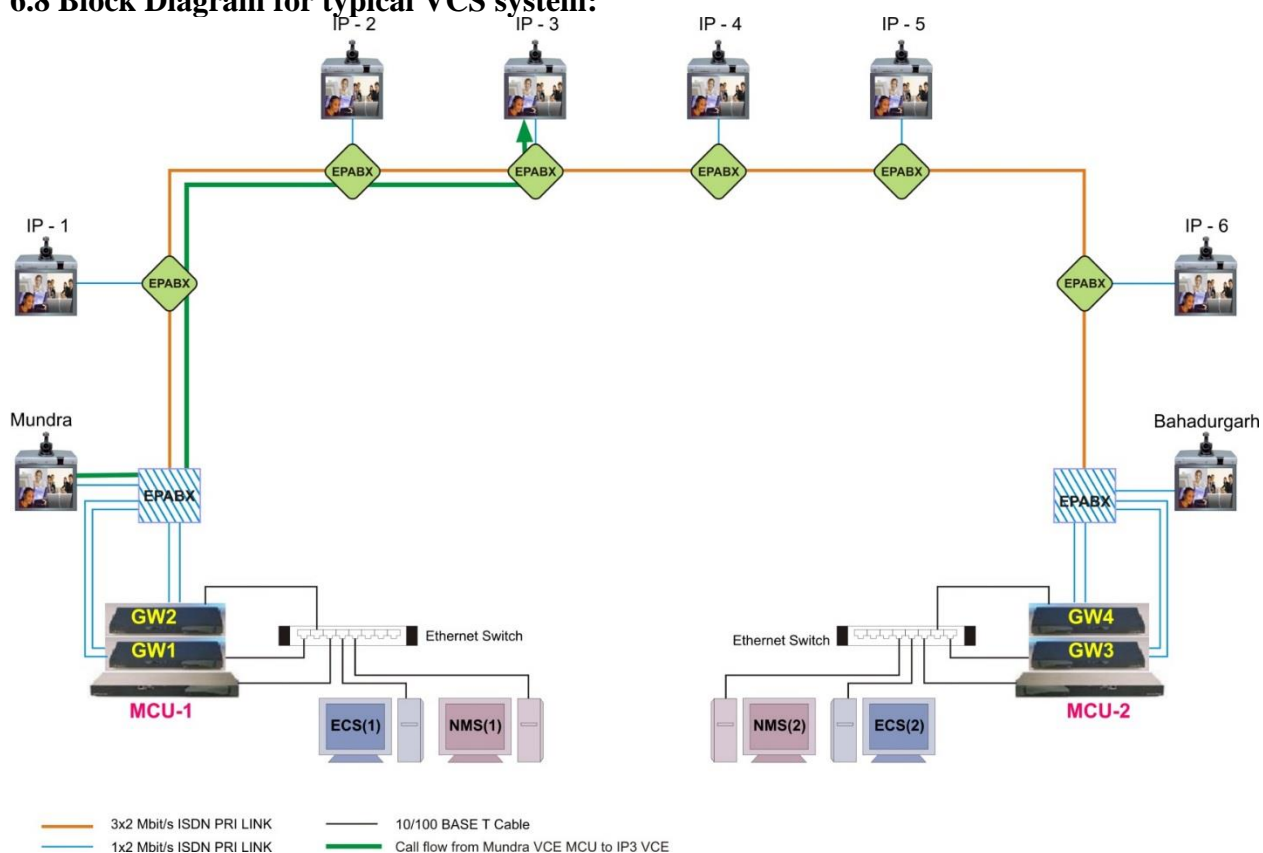
6.6 Location of Installation:

VCS system is installed at all Manned locations.

6.7 Parts:

VCS system consists of Video camera encoder, Switch, VCS MCS.

6.8 Block Diagram for typical VCS system:



6.9 Maintenance of VCS system

16.9.1 Switch on the VCE device at all the stations.

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6.9.2 Each location to check and inform if gateway is available in the VCE device or not, if the video is properly displayed on the twin screen.

6.9.3 Login into VC system.

6.9.4 Ping all the VCE devices and check for connectivity.

6.9.5 IPs for All VCE devices are in Annexure -1.

6.10 Format for maintenance of VCS system

Location :
TELECOM


Department:

Month:
Monthly

Frequency:

Doc No: ISF/TEL/05

क्रमांक Sl. No.	निर्देश Instructions	परिणाम Observation	टिप्पणी Remarks
1	Availability of gateway at all locations.		
2	Check the UPS power supply (Neutral-earth<5V)		
3	Check for Connectivity with all locations.		
4	Check for connectivity with all MCUs		

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5	Check Conference creation.		
6	Check for proper movement of VCS camera.		
7	Check for proper display on twin screen.		
8	Check the tightness of various connections in ACDB.		

Annexure-1:

VCS Node IPs are as below:

Station	IP Address

Prepared by

Signature :

Name :

Designation :

Date :

Approved By

Signature :

Name :

Designation :

Date :

6.11 RELEVANT RECORDS:

Maintenance of VCS System: ISF/TEL/05

6.12 Frequency:

Maintenance of VCS System frequency - Monthly


7. SOP For Maintenance of STS Server:

7.0 Purpose:

To provide guidelines for maintenance of STS Server.

7.1 Scope:

Scope of work includes maintenance of STS Server provided at the location.

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7.2 Responsibility:

Officer In-Charge-Telecom/Maintenance In-charge

7.3 References:

NIC CODE 61102 - Maintenance of Telecom network

OISD-STD- 141: Design and Construction Requirements For Cross Country Hydrocarbon Pipelines

7.4 Usage:

This is GPS/GPRS based system used for tracking the line walkers on real time basis. It consists of tracking devices and dedicated server.

7.5 Importance:

This system is used for tracking the live locations of line walkers and tracks and timing and other parameters are continuously logged which may be referred later if required. It helps to maintain the safety and security of the pipeline by monitoring the line walkers. This system also used as a communication medium between the line walker and control room through voice call facility. The data is available in the central database server where users can see online status of security personnel on digital maps, along with diagnostic reports.

7.6 Working Principle:

This is GPS /GPRS based system in which location of the line walkers are recorded in a mobile device through the GPS and that GPS data is being sent to a dedicated server through GPRS facility where it is processed and provided in a palatable manner.

7.7 Location of Installation:

STS server generally installed at one central location for one/more pipeline.

7.8 Parts:

Server with STS software.

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7.9 Maintenance of STS server

- Take cold work permit from shift in charge
- Open the front cover of CPU.
- Clean the air filters of the panel and ensure no dust is settled on the CPU.
- Ensure the proper connectivity of the modem.
- Ensure proper connectivity of server.
- After completion of the job close the work permit

7.10 Format for maintenance of STS server:

Location :
TELECOM


Department:

Month:
Monthly

Frequency:

Doc No: ISF/TEL/06

क्रमांक Sl. No.	निर्देश Instructions	परिणाम Observation	टिप्पणी Remarks
1	Check for Power supply and Link status of Modem.		
2	Check for status of STS software exe files working on the server.		
3	Conduct Internet connection speed test on the server.(It		

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	should match with subscribed speed)		
4	Check availability of STS history data.(Last 3 months data to be retained).		

Prepared by

Signature :

Name :

Designation :

Date :

Approved By

Signature :

Name :

Designation :

Date :

7.11 RELEVANT RECORDS:

Maintenance of STS Server: ISF/TEL/06

7.12 Frequency:

Maintenance of STS Server frequency - Monthly

8. SOP For Maintenance of PA System:

8.0 Purpose:

To provide guidelines for maintenance of PA system.

8.1 Scope:

Scope of work includes maintenance of PA system provided at the location.


8.2 Responsibility:

Officer In-Charge-Telecom/Maintenance In-charge

8.3 References:

NIC CODE 61102 - Maintenance of Telecom network

OISD-STD- 141: Design and Construction Requirements For Cross Country Hydrocarbon Pipelines

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8.4 Usage & Importance:

Public Address System is an electronic sound amplification and distribution system with a microphone, amplifier and loudspeakers, used to allow a person to address a large public, for example, for announcements of emergency or critical information to all at once.

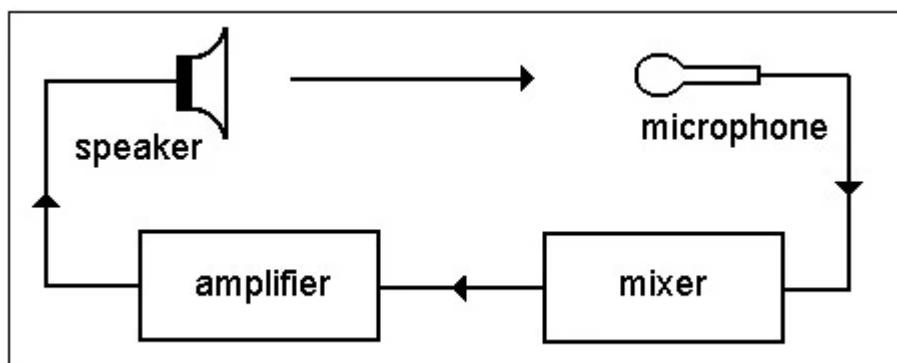
8.5 Location of Installation:

PA system is installed in control room at all locations.

8.6 Parts:

A microphone, amplifier and loudspeakers.

8.7 Block Diagram of PA system:




8.8 Maintenance of PA System :

8.8.1 Obtain Cold Work Permit

8.8.2. Clean the Rack cabinet with help of blower and to avoid any dust.

8.8.3. Ensure that all cooling fans, which are located on the top of the cabinet, are in working condition.

8.8.4. Ensure that connection between Main Call Station and Voice Alarm Controller is tight and compact.

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8.8.5. Press appropriate key of the zone selector of main call station to start communication. Check whether the message has been passed on to the respective zone or not (LED indications about healthiness of Main call station- Green: System Healthy, Amber: Warning, Red: Emergency state).

8.8.6. To activate the Emergency mike (hand mike), long press the red power button of the controller and start communication. Check whether everyone is able to receive the same or not.

8.8.7. Visually inspect the power supply connection to the controller and three amplifiers. If connection is ok then green led will be blinking on controller and amplifiers.

8.8.8 Press appropriate key to start communication and check whether the message has been passed to all speakers provided in different areas of the location to check whether everyone is able to receive the communication.

8.8.9. Cut off the mains power supply to the panel and check whether the system is switching to battery mode or not.

8.8.10. Check for any fault indicators on the Voice Alarm Controller, if any fault indications are there, appropriate action to be initiated immediately.

8.8.11. Ensure that all horn loudspeakers are working inside the station.

8.8.12 Ensure that earthing connection to the panel is proper.

8.8.13 After completion of the job close the work permit

8.9 Format for maintenance and testing of PA system:

Location :


Department: TELECOM

Month:
Monthly


Frequency:

Doc No: ISF/TEL/07

क्रमांक Sl. No.	निर्देश Instructions	परिणाम Observation	टिप्पणी Remarks
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1	Cleaning of the rack cabinet & check the functionality of cooling fan		
2	Check the functionality of main call station by selecting the appropriate zones		
3	Check the functionality of emergency mic (hand mic).		
4	Check the power supply to the Voice Alarm controller amplifiers and PA coupler (LED inspection)		
5	Check whether the system is switching over to battery in case of power failure		
6	Check the connectivity between main call station and Voice Alarm controller		
8	Check the functioning of all Horn Loudspeakers		

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	of the station		
9	Check the condition of Earth wire of the panel		
10	Check the connectivity between PA coupler & Mixer Amplifier		
11	Check the connectivity between EPABX and Tel-Line of PA coupler		
12	Check the functionality of PA system through PA coupler.		

Prepared by
Signature :
Name :
Designation :
Date :


Approved By
Signature :
Name :
Designation :
Date :

8.10 RELEVANT RECORDS:

Maintenance of PA System: ISF/TEL/07

8.11 Frequency:

Maintenance of PA System frequency - Monthly

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9. SOP For Maintenance of PIDS System:

9.0 Purpose:

To provide guidelines for maintenance of PIDS system.

9.1 Scope:

Scope of work includes maintenance of PIDS system provided at the location.

9.2 Responsibility:

Officer In-Charge-Telecom/Maintenance In-charge

9.3 References:

NIC CODE 61102 - Maintenance of Telecom network
OISD-STD- 141: Design and Construction Requirements For Cross Country Hydrocarbon Pipelines

9.4 Usage:


This is an OFC based system which is used to detect any vibration, movement and motion related activity over our pipeline like digging etc. tracking the line walkers on real time basis. Pipelines are already laid with OFC for data and voice transfer. The spare fiber in this OFC cable is used for this system.

9.5 Significance:

This system is used for protection of oil & gas pipelines against pilferage and sabotage. This system has the ability to accurately pin point location as well as it can detect intrusion & likely damage.

9.6 Working Principle:

Sound or vibrations near the fiber change this back scattered light. These changes are then analyzed by the interrogator unit and vibrations/ sounds that cause them are recreated. These

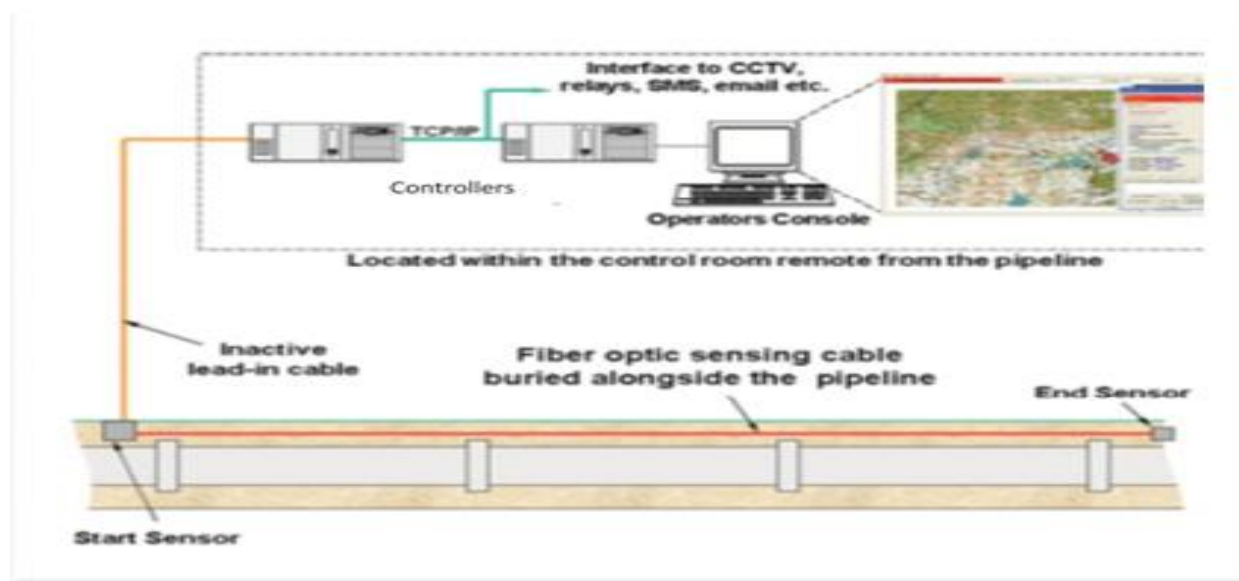
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sounds are then sent to acoustical sensing unit which then analyses these sounds and based on its algorithms give alarm for events.

9.7 Parts:

OFC sensor Unit (Helios), Data base server (Panoptes), User Interface (Client Machine)

9.8 Block Diagram:




9.9 Maintenance of PIDS System:

9.9.1 Ping the Helios Unit installed at SV stations for the connectivity.

9.9.2 For taking OTDR of PIDS OFC follow below steps:

- Get Helios Laser Off first by getting in touch with PIDS AMC Vendor(M/s Commstel)
- Softly remove E-2000 connector from back side of Helios and place cap cover on helios ofc connector to avoid dust ingress.
- Connect E-2000 connector with OTDR machine and conduct OTDR and store.

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- Gently reconnect E-2000 connector back to helio unit.
 - Get Laser On in coordination with PIDS AMC Vendor.

9.9.3 Clean PIDS panel with the help of blower.

9.9.4 Measure incoming AC voltage of PIDS rack. Should be in the range of 230VAC.

9.9.5 Completely switch off the PIDS rack by turning off PIDS Rack's main MCB and switch it ON after 2 mins.

9.9.6 After Switching ON PIDS system must reboot on it's own and should start working normally. In case of abnormality, raise the issue to AMC Vendor.

9.9.7 Check generation of alarms (at least 1) in all section.

9.9.8 Also check for the following details in system health from the client station.

There should be green tick on Panoptes Master as well as Panoptes Backup and Helios units.

The running units will have blue star near green tick.

9.10 Safety Precautions and PPE Usage:


- Functioning of PIDS System is very critical for ensuring proper safety and security over pipeline
- Following Safety Precautions to be used while handling PIDS equipment:
- Ensure the proper connectivity of LAN cables.
- Ensure proper connectivity of server.
- Proper Work Permit System to be followed.
- Intimation to be provided to control room prior start and after completion of activity.
- While doing any maintenance work proper back up to be taken at server end

9.11 Troubleshooting for PIDS:

Case 1: PIDS Client Not Working

Check for updating of OFC related data from server end.



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If OFC link is OK PING the STS server IP from client end.



If ping is available re-start the server and check the updating. If client is even not updating check the client IP address in coordination with the ROU in charge /vendor.



If Ping is not found then the server end to be checked for connectivity and if all the connectivity found OK then vendor to be coordinated.

Case 2: PIDS system shutdown/not getting started

Check the system for temperature and proper cooling function



If temperature threshold is not OK, temperature to be reset and server to be restarted



If the problem is not resolved contact the concerned vendor.

Case 3: Events not logged beyond a particular location

Check the healthiness of the fiber by doing OTDR in coordination with the vendor



If losses are more than desired, steps to be taken for OFC loss minimization



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If fiber is found OK, contact the concerned vendor for proper resolution

9.12 Maintenance of PIDS system:

Location :
TELECOM


Department:

Month:
Monthly

Frequency:

Doc No: ISF/TEL/08

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1	Test Pings of all remote and local Helios and panoptes units.		
2	Clean PIDS panel rack.		
3	Measure and record incoming 230VAC healthiness.		
4	Measure 48VDC to 230VAC convertor output voltage.(Applicable for Helios units installed at SV stations)		

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5 9.12F o r m	Take OTDR of PIDS OFC cable.(Ensure Laser off before taking OTDR)		
6 a t	Check working and healthiness of PIDS Rack AC units		
7 f o r	Test Auto Reboot functioning of PIDS system.		
8 M a P r	Check Helios and Panoptes health after rebooting of PIDS system.(There should be running healthy tick on panoptes screen)		

Prepared by

Signature :

Name :

Designation :

Date :

Approved By

Signature :

Name :

Designation :

Date :

9.13 RELEVANT RECORDS:

Maintenance of PIDS System: ISF/TEL/08

9.14 Frequency:

Maintenance of PIDS System frequency - Monthly