

POWER GRID CORPORATION OF INDIA
LIMITED

SYSTEM COORDINATION & CONTROL
NORTHERN REGION PROJECT

LOA # C-11701-S858-1/535/I AND 536/II dtd. 12.1.98

Fiber Optic Transmission System

(Including TMS/TMN)

MAINTENANCE PLAN

**JV of FURUKAWA
(JVF)
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I. SCOPE

The scope of this document is to provide the maintenance plan for Fiber Optic System Network operation for a period of one year starting from the issue of Operational Acceptance Certificate (OAC). The maintenance plan details the activities to be performed by the Contractor (JVF) in the said one year termed as "Guaranteed Availability Period" (GAP) as per clause # 6.3.1 of the Technical Specifications of the POWERGRID contract (vol. II).

II. OBJECTIVE

The objective of this Maintenance Plan is to ensure implementation of the Maintenance Services for the POWERGRID's Fiber Optic System including FO cable & accessories and FO transmission systems. Every person involved with the maintenance activity shall be familiar with the contents of this document to ensure common understanding to deliver the agreed level of service and performance to POWERGRID. The objectives of the Maintenance Plan during Year-I i.e. Guaranteed Availability Period shall be:

- Support established good working practices for operation & Maintenance through "On the Job Training (OJT)".
- Support the O & M competence transfer from JVF to POWERGRID.
- Demonstrate the guaranteed availability of POWERGRID's Fiber Optic System commissioned by JVF.

III. BRIEF NETWORK DETAILS

POWERGRID has awarded the contract for supply, installation, testing and commissioning of Fiber Optic System including FO cable & accessories and FO transmission systems with the appropriate TMS/TMN to JVf. The SC&C - NR Project interconnects the generation, transmission and distribution facilities of various constituents in 7 northern states of India as under:

- Jammu & Kashmir
- Himachal Pradesh
- Haryana
- Punjab
- Delhi
- Rajasthan
- UttarPradesh

There are a total of 57 sites in the seven states and the network elements consists of:

S.No	Type of Components	Unit	Quantity
1	OPGW Cable and Accessories	Kms.	1811
2	Joint Box	Nos.	595
3	Fiber Optic Distribution Panel	Nos.	52
4	SDH Transmission Equipment (FLX-150T)	Nos.	26
5	SDH Transmission Equipment (FLX-150/600)	Nos.	41
6	Optical Amplifier (FLX OPX)	Nos.	12
7	Network Management Terminal (FLEXR)	Nos.	15
8	Network Management System (FLEXR Plus)	Nos.	9

Network Management System (FLEXR Plus) has been installed at following locations:

- Delhi RSCC
- Minto Road
- Panipat SLDC
- Chandigarh

- Jutogh
- Gladni
- Heerapura
- Lucknow Shakti Bhawan
- Kanpur

IV. MAINTENANCE SET UP (YEAR-I)

FOTS Network shall be monitored during the "Guaranteed Availability Period" using NMS at Delhi RSCC. The network monitoring shall be performed by POWERGRID representative who shall generate/record the fault reports and shall be responsible for co-ordination with JVF coordinator and shall maintain an operational logbook of the faults as reported by the NMS. The JVF coordinator shall be based at following location :

Coordinator : Mr. V.K. Senthilarasan / Mr. R.N. Sharma

Address : A-292, Ground Floor, Mahipalpur Ext.,
NH-8, New Delhi – 110037.

Contact Nos. : 91-11-6785344/45, 6786051/52, 3706070- upto 76

Fax : 91-11-6781870, 3321321

Mobile Nos. : 91-9810154344 / 91-9811032789

In case of any fault noticed in the network, a Fault report will be generated and forwarded to JVF coordinator for the remedial action through fax/telephone information. JVF coordinator shall follow up on corrective actions such as repair/rectification/replacement and shall keep POWERGRID representative at RSCC updated about the status of restoration.

Year-I Maintenance activities shall be both event based (corrective maintenance) and planned (preventive maintenance). Planned preventive works shall be mainly carried out during working days. Event based

work shall be carried out round the clock so as to meet the availability requirement.

The preventive maintenance tasks for the system include:

- Physical checking of Joint Box and FODP
- End-to-end Fiber Loss measurement
- Visual Inspection of equipment
- Alarm measurement verification
- Status report of site
- Updating of the log records

The frequency of preventive maintenance shall be twice in Year-I for each location/link.

Corrective Maintenance is a fault correction process for Network elements. The corrective maintenance tasks for the system include:

- Troubleshooting on FO cable and associated components
- Trouble shooting on a network element
- Identification of faulty hardware unit, replacing it and performing a functional test.
- Performance of function verification in co-operation with NMS operator.
- Repairing of defective components and return to POWERGRID stock.

V. HARDWARE SERVICE (YEAR-I)

Incase of any failure or malfunction is noticed/observed; the problem shall be reported to JVF coordinator, who shall identify the problem, replace the faulty unit/product with a spare unit and send the faulty unit to factory at Japan for rectification/repair. POWERGRID will send a duly filled out Fault Report (on the format provided by JVF in Annexure I). POWERGRID shall be responsible for storage/management of the spares units of the Central Sector and shall assist/co-ordinate with the constituents for arranging/issuance of spares from the constituents in a similar case.

In the event of a unit being damaged beyond economic repair (BER), JVF shall not be obliged to repair (after due justification) such unit but shall offer to POWERGRID a replacement unit out of the spare units or at an additional price.

JVF's obligation to repair or replace unit(s) does not cover any defects arising out of or in-connection with any improper handling or use by POWERGRID or by external reasons, such as (but not limited to) excessive physical force, water or humidity or other detrimental environmental or operations conditions beyond the specifications and their limits specified in the contract. In these cases, JVF shall offer to POWERGRID, replacement unit(s) at an additional price along with the report detailing reasons for not repairing the faulty units.

The hardware repair process of JVF shall be as under:

JVF Responsibility :

- The contact person at JVF shall receive faulty units along with the duly filled-in Fault Report.
- Monitor turnaround time and inform POWERGRID regarding status of Repair.
- Send the repaired unit to POWERGRID.

POWERGRID Responsibility:

- Operate the Network and Monitor the health of the system.
- Inform JVF's coordinator of any malfunctioning as and when detected during 24-hour shift everyday.
- Send faulty unit to JVF coordinator's location along with the Fault Report duly filled-in.
- POWERGRID shall follow any specific instruction and procedure(s) with regard to the unit, which JVF may notify depending on the situation.
- POWERGRID shall furnish the following documents for enabling export of faulty units to JVF repair center at Japan :
 - Export Invoice duly signed by POWERGRID.
 - G.R. waiver from bank to be arranged by POWERGRID.
 - Authorization letter to export faulty units for repair.
 - Fault report duly filled-in.
 - Any other statutory requirement/formality to be met that may be announced by the govt. during the period.

VI. AVAILABILITY REQUIREMENTS

The availability of FO network shall be calculated for the E-1 channels of FO network after the completion of GAP and should be 99.9%.

The System Availability shall be calculated as follows:

$$S.A. = [\{T_T - \Sigma(N_X * T_X)/N_T\}/T_T] * 100 \%$$

where

S.A. = System Availability [%]

T_T = Total Test Time [hours], i.e. 1 year, (8760 hours)

N_T = Total E1 Channels

N_X = Unavailable E1 Channels

T_X = Unavailable Time of N_X [hours]

Annexure I

FAULT REPORT

FAULT REPORT NO.		
Date & Time of Fault Reported:	Site:	Equipment Name:
	Part Number:	FAULT Found Date:
	Serial No.:	
	Iss. No.:	
Access to the System (Date and Time):		
Nature of Failure:		
Details of Failure:		
Restoration of the System (Date and Time):		
Outage Time, if any (in hours):		
Spare Parts/Modules Utilized:		

