**Annexure A**

**Scope of Work**

**Network Maintenance Services – Chennai**

Table of Contents

[1. About RJIL 4](#_Toc161851375)

[2. Background 4](#_Toc161851376)

[3. Jurisdiction: 4](#_Toc161851377)

[4. Scope of RJIL 4](#_Toc161851378)

[5. Scope of Service Provider: 5](#_Toc161851379)

[6. Scope of Work for O&M for Optical Fiber Cable Network: 5](#_Toc161851380)

[6.1 Details about the Optical Fiber Cable Network: 5](#_Toc161851381)

[6.2 Activities to be caried out by the SP: 6](#_Toc161851382)

[6.2.1 Preventive Maintenance (PM) 6](#_Toc161851383)

[6.2.2 Corrective Maintenance: 11](#_Toc161851384)

[6.3 SP’s Support Organization for O&M of the fiber network: 14](#_Toc161851385)

[6.4 SLA and KPI compliance for Fiber Network 15](#_Toc161851386)

[7. Scope of Work for O&M for Tower & Facility sites: 15](#_Toc161851387)

[7.1 Details about the Tower & Facility sites: 15](#_Toc161851388)

[7.2 Activities to be caried out by the SP: 16](#_Toc161851389)

[7.2.1 Preventive & Scheduled Maintenance: 16](#_Toc161851390)

[7.2.2 Corrective Maintenance: 19](#_Toc161851391)

[7.3 The SP’s support Organization for O&M of Tower sites 21](#_Toc161851392)

[7.4 SLA and KPI for Tower Sites 21](#_Toc161851393)

[8. Mandatory Requirements 22](#_Toc161851394)

[9. Escalation Matrix for SP 22](#_Toc161851395)

[10. Subcontracting 22](#_Toc161851396)

[11. Exit Management Plan 22](#_Toc161851397)

[12. Contract Termination 23](#_Toc161851398)

[13. Network Mitra 23](#_Toc161851399)

[14. Automation Tools 23](#_Toc161851400)

[15. Quality 23](#_Toc161851401)

[16. Compliance: 24](#_Toc161851402)

[17. Management Information System (MIS) : 24](#_Toc161851403)

[18. ROW (Right of Way) Management: 25](#_Toc161851404)

[19. Co-ordination: 25](#_Toc161851405)

[20. Training: 25](#_Toc161851406)

[21. Spares Management: 25](#_Toc161851407)

[22. Packaging: 25](#_Toc161851408)

[23. HSEF (Health Safety Environment Fire) : 26](#_Toc161851409)

[24. Damages/ Asset damages: 26](#_Toc161851410)

[25. Asset and Inventory Management 26](#_Toc161851411)

[Annexure – I: (A) Field Equipment 27](#_Toc161851412)

[Annexure – II: SLA & KPI for OFC Operation & Maintenance 29](#_Toc161851413)

[Annexure – III – O&M SLA & KPI for Tower Sites 41](#_Toc161851414)

[25.1.1 SLA / KPI – Small facilities (Tower/ENB Sites – Own (P1), IP Colo, gNB(5G NR) ) 41](#_Toc161851415)

[25.1.2 SLA / KPI - Medium Facilities (MAG2, NAG2, ILA, NAG1) 43](#_Toc161851416)

[25.1.3 SLA / KPI – Small Cell (Outdoor) & Enhanced Small Cell (ESC) 44](#_Toc161851417)

[Annexure – IV - Activities / Tasks to be Performed. 48](#_Toc161851418)

[1. Preventive Maintenance Scheduling 70](#_Toc161851419)

[2. New Equipment Addition 71](#_Toc161851420)

[3. Deviation from PM plan 71](#_Toc161851421)

[Annexure – V: Manpower Dimensioning for Tower & Fiber Network 93](#_Toc161851422)

[25.1.4 Resource Dimensioning 93](#_Toc161851423)

[25.1.5 Skill set of Resources. 93](#_Toc161851424)

[25.1.6 Proposed Manpower calculation basis for O&M of Fiber Network & Tower sites 95](#_Toc161851425)

[Annexure – VI: List of Free Issue material (FIM) and Test & Measurement Instruments (TMI) 102](#_Toc161851426)

[Annexure – VII: Division of Responsibility (DOR) & RACI Matrix 115](#_Toc161851427)

[25.1.7 Division of Responsibilities as agreed between the Service Provider and RJIL 115](#_Toc161851428)

[25.1.8 RACI Matrix - P&U (Power & Utility) 117](#_Toc161851429)

[25.1.9 Telecom Equipment RACI Matrix 118](#_Toc161851430)

[25.1.10 RACI Matrix - OFC 120](#_Toc161851431)

[Annexure – VIII: GUIDELINES FOR NETWORK MITRA 121](#_Toc161851432)

[Annexure – IX – Automation Tools 128](#_Toc161851433)

[Annexure – X - Occupational Health & Safety Guidelines 130](#_Toc161851434)

[Annexure – XI - Reliance Group Business Partner Code of Conduct (BPCOC) 143](#_Toc161851435)

# About RJIL

Reliance Jio Infocomm Limited (**RJIL**) is a telecommunications company and a subsidiary of Jio Platforms Limited, headquartered in Navi Mumbai, Maharashtra. It operates largest Wireless & Wireline telecom network with coverage across India. Jio offers 4G, 5G & multiple enterprise services to a very large base of customer spread all over India.

Fiber assets of the company are held by Jio Digital Fiber Private Limited (**JDFPL**) and the utility and Tower asset are held by Summit Digital Infrastructure Private Limited (**SDIPL**), both of which are Infrastructure Investment companies (“**Invit**”).

# Background

RJIL wishes to award contracts to eligible **Service Provider(s)** (SP) for Operation and Maintenance of following equipment/infrastructure on a long-term basis, subject to the terms and conditions of Agreement executed between the Parties. RJIL Infrastructure includes:

1. Optical Fiber Cable (OFC) Network (Owned by JDFPL)
2. Utility Equipment and infrastructure (Owned by SDIPL)
3. Field Electronic Equipment - **Annexure – I (A)**

This scope and specification cover the Preventive Maintenance, Scheduled and Planned maintenance and break down corrective maintenance activities, improvement of technical parameters of Network.

The scope of work mentioned in the document is not limited to activities mentioned in the document and revision of the scope of work will be in sole discretion of RJIL and Company to meet business need/objectives. Any revision in scope or scope of work by RJIL will be communicated to the respective Service Provider. Service provider will ensure the adherence to the revised / latest scope of work as per RJIL requirements. If additional scope has any commercial impact, same will be mutually agreed by both the party. Any reference of RJIL in this document is primarily as the owner of the Project, to [explain the scope of services to be carried out by the Service Provider and shall not create any privity of contract between Service Provider and RJIL.

The Overall Performance of SP will be reviewed based on the KPI and SLAs as mentioned in the **Annexure-II.**

# Jurisdiction:

The jurisdiction of this document covers RJIL’s network as detailed out in this document.

# Scope of RJIL

* 1. RJIL will provide up to 2 no. of workstations at the RJIL’s O&M offices located at State Head Quarter (SHQ) / Maintenance Point (MP) / Jio Center (JC) / Jio Point (JP) for day-to-day co-ordination. Any additional workstation at RJIL will be provided on need basis for governance and other activities.
  2. RJIL shall provide the necessary site access to the Service Provider.
  3. All Free Issue material (FIM) including Test and measurement instruments (**TMI**) (as per the **Annexure II**) will be provided to SP, which will be issued from Circle Maintenance Point (CMP).
  4. RJIL will provide access for different types of automation tools as per Annexure-II being developed to enhance network performance and availability during O&M activities.

# Scope of Service Provider:

The Scope of Work has been, for ease of explanation, divided across the following two areas:

1. Operations and Maintenance for the Optical Fiber Network (Includes fiber route, manholes, termination points and Overhead (OH) fiber across NLD, FTTX, Intra-city, Inter-City, Access and all other fiber touch points as detailed in the Annexure I.
2. Operations and Maintenance for the Utilities, Active and Passive Equipment, Enclosures and Towers at all the locations as per list attached in Annexure-I.

SP shall provide minimum manpower for Tower & Fiber network as dimensioning guidelines mentioned in Annexure V. – Incase additional manpower is required to meet the KPI requirement, same will be deployed by SP without any additional cost to RJIL. SP shall provide details in Manpower deployed in monthly Joint Measurement Sheet (JMS) as mandatory requirement during billing.

SP to maintain all issued equipment’s in good and calibrated condition (Calibration is applicable to OTDR, LSPM, OLTS etc.) at all times.

Monthly reconciliation statement along with calibration status to be submitted along with running invoice of the month. SP shall provide necessary documents as and when required by the RJIL in this regard.

To facilitate smooth HOTO and operations, KPI/SLA Penalty or Rewards (applicable for preventive maintenance & corrective maintenance only) holiday will be applicable for 60 days from the date of completion of HOTO of circle.

# Scope of Work for O&M for Optical Fiber Cable Network:

Purpose of this section:

This section details out the following information so as to enable the SP to fulfill his obligations under this Scope of Work:

* Details about the fiber network
* Activity to be carried out by SP.
* The SP’s support Organization / team required.
* Service Level Agreement (SLA) and Key Performance Indicators (KPI) that are expected to be met.

# Details about the Optical Fiber Cable Network:

The various kinds of optical fiber cables deployed in the network are detailed in Annexure I.

# Activities to be caried out by the SP:

On issuance of the Order SP will perform survey of the route offered, In case if SP observes any discrepancies in route length, he has to report to RJIL within 30 days from start of HOTO.

The maintenance activity mainly consists of the following two (2) areas:

1. Preventive Maintenance (PM) of OFC routes (maintenance prior to the occurrence of any fault: Patrolling cum Surveillance, guarding, proactive planning for avoiding cuts of cable based on ground condition and movements, straightening of sagging overhead cables, checking health of dark fiber regularly, Health monitoring of Handhole/Manhole, making alternate arrangement for early restoration of future cable failure etc.)
   1. Route Survey / Patrolling
   2. Scheduled and planned Maintenance of OFC routes etc. (Maintenance for better performance of route: Patch work, replacing of lossy section by new OF Cable including splicing and allied works)
   3. Regular Dark Fiber Testing
2. Corrective Maintenance (CM) of OFC routes (Maintenance after occurrence of fault: splicing, trenching, laying of underground cable, digging of joint pits/chambers including reinstatement of the same and other allied works).

**Note:**

The PM & CM activity will be carried out by SP on Intracity, Intercity, FTTX and Enterprise fiber route as defined in different section of this document.

FTTx and enterprise OFC network is also in SP scope. FTTx and enterprise fiber cable from OLT up to S2 / OTB is in the scope of FTTx team. FTTx and enterprise fiber routes up to OLT are to be maintained similar to intracity fiber routes.

Service delivery / service assurance activities scope / services inside customer premises - homes (FTTH) ie., beyond S2 / OTB to ONT is out of SP’s scope at present and will be indicated separately later, if need be (in case OLT is placed inside the building, maintenance scope is till that point). Splitter S2 / OTB is part of SP scope.

### Preventive Maintenance (PM)

The primary focus is to avoid the occurrence of OFC cuts/damage due to any activity by any person or agency or due to natural reasons for which SP has to employ route patrolling & other innovative method.

SP has to keep good rapport and co-ordination with all Government and Non-Government bodies / authorities and also farmers/ landowners to collect their plan of activities for the routes, which may prevent damages to the OF Cables.

Route length shall be in physical road length and not OFC length. SP has been assigned the fiber route length as per the Work Order awarded.

New Fiber routes are being deployed in the network from time to time.

SP shall perform the following HOTO (Hand Over & Take Over) activities for the same.

* SP shall takeover the new fiber routes with necessary guidelies, practices & directions from Project / Deployment team.
* SP shall Inspect and audit the fiber route and revert with a punch list if any deviation is observed as per the RJIL HOTO documents within 30 days. Critical punch points must be listed and followed up and liquidated through local project / deployment team as per the HOTO procedure, as intimated by CTO. HOTO guidelines will be shared post award of contract.

**Activities performed during Preventive Maintenance are listed below.**

* + - 1. **Route Survey / Patrolling**
    1. The Patroller of the SP has to patrol entire section regularly on daily basis, for all the 7 days of the week, irrespective of Sundays / holidays. However, the SP shall carryout the additional patrolling whenever it is necessary as per the actual site conditions. The patrolling timings shall vary as per the actual requirements. The patrolling teams must be vigilant in respect of OFC routes where road expansion / construction activities are in progress.
    2. The patrolling teams shall be available on 24 hours basis on all the days in a week on Mobile phone for information about any potential activity that may cause damage to OFC along the route.
    3. The patrolling teams shall have mobile phone connections.
    4. While patrolling, the patroller has to keep a close watch on the OFC as well as activities going on around it and make all necessary observations.
    5. The SP shall be constantly in touch with the following authorities so as to update himself with the proposed works that may be executed by them in near future. The SP shall safeguard RJIL OFC against any signs of damage or potential damages, which is required to avoid OFC cuts that may arise during the execution of works by those authorities / agencies. The SP shall take suitable precautionary steps in consultation with designated officer of RJIL ahead of time, such as re-routing of OFC either underground or overhead, providing additional protection to the existing alignment etc.
    6. The activities which are likely to cause damages to OF cable are as under: -
    7. National Highway works such as widening of roads, embankment works, major bridge, sub-way, Flyover, culvert works and tar melting work on the cable routes, which may cause damage to the cable.
    8. State Highways, R&B Departments as mentioned above.
    9. Water/Gas Supply Department works may trench on our cable route and as such extreme care is to be taken.
    10. Railway department works such as construction of over bridges / under bridges, etc.
    11. Forest department works, such as plantation / removal of trees on the cable routes, which may cause damage to cable.
    12. Electricity board works like trenching on our cable routes, erection / removal of electricity boards posts on cable routes, etc.
    13. Other Telecom Operators activities like trenching, HDD (Horizontal Directional Drilling), erection of poles etc., and similar activities by other local operators
    14. All Central / State / District / Municipal / Local / Panchayat / Political Authorities / Agencies / Bodies, etc.
    15. Putting up of pandals, by social organizations in connection with the visit of VIP meetings and functions.
    16. Digging wells / pump sets by private parties near the brim of the Highways.
    17. Works carried out like storm water drain, diversion of rainwater on the Highways concerned, by Village Panchayat and Municipal Authorities of the area.
    18. Excavation / Renovation work being undertaken by private landowners through which RJIL OFC is passing.
    19. SP has to keep a good rapport and effective coordination with local bodies/ agencies including those mentioned above, of their proposed activities which may pose a threat to the OFC. On receipt of any such information the SP must immediately inform the designated officer of RJIL and undertake all precautionary measures that will prevent any harm or damage to the OFC.
    20. If the Patroller observes that work is being carried out in and around the OFC route alignment by any SP / Individuals, he must take charge of the situation, take preventive action immediately and inform the designated officer of RJIL. He must proceed on his further patrolling duties after handing over charge of the situation to a Reliever from the SP’s team.
    21. SP also has to ensure that, the Route indicators already placed at regular intervals along the routes are not stolen. The missing / damaged indicators if any shall be planted by the SP as per RJIL specifications for which the indicators will be supplied by RJIL.
    22. By Walking along the path where overhead OF cable is laid, the condition of the overhead OF cable shall be monitored. In case of any sagging of the overhead alignment, immediate action shall be taken by the SP to correct it as per the advice of designated officer of RJIL.
    23. SP has to maintain Management Information System (MIS) reports on a regular basis as per RJIL approved formats and will submit to the designated officer of RJIL within the specified time limits.
        1. **Preventive & Scheduled Maintenance:**
    24. Maintenance of all types of OFC network (excluding that beyond Splitter 2 i.e. inside customer premises-homes) laid by conventional trenching, HDD, micro-trenching, Temporary and Permanent (structured) aerial methods.
    25. OFC network Preventive Maintenance activity which includes fiber Route surveillance, Dark Fiber testing and corrections, aerial Sag clearance in case of aerial build, safeguarding of fiber route in case of infra expansion, Manhole cleaning, Manhole shifting, Manhole raising, Replacement of broken manholes and Lids; as required for fiber network.
    26. The scheduled Maintenance is a planned activity for improving the quality of fibers in a OF cable for bringing the overall section loss within the permissible limits. The standard OF section loss specified per KM is 0.3 dB at 1550nm. The standard splice loss is specified as < 0.1dB for all joints/ tapings. The fibers in a section shall have continuity from end to end. This planned activity is required to be done at the discretion of by RJIL.
    27. In order to safeguard the Fiber during the expansion related work, Fiber Safeguarding (Taking out existing laid OFC and lay it on bamboo/wooden poles on any available space on side of expansion, T2P, RFMS activities to avoid cuts. Laying and material expenses against Wooden bamboo/poles are in SP scope.), up to 0.5% of the Maintenance Point (MP) scope every month (on cumulative basis) is part of Scope and will not be payable extra.

In any specific fiber routes (Span) where expansion works continue for more than six months at a stretch and SP safeguards the routes successfully. Such safeguarding activity beyond six months shall be considered as an additional scope and SP can ask commercial over and above of this contract with prior approval of CTO and NHQ. This shall ensure no disruption of services.

* + 1. 24 no’s Manhole raising and 24 no’s of Manhole Shifting (including laying of OFC up to 50m) per year per MP are part of SP scope and will not be payable extra. For Manhole raising, Collar will be given as FIM. Over and above, what is stated in the preceding paragraph will be payable extra, on approval of State CTO. Maintenance Vehicle to be used for material movement. The planned maintenance activity shall be carried out with prior approval of designated officer of RJIL. The shutdowns for carrying out the activity will be permitted by RJIL generally during maintenance window.
    2. Span continuing across the allocated cluster (X) into a neighboring cluster (Y) will need to be maintained by the SP, who has been allocated greater part of the Span in the cluster (X).The scheduled planned activity caters to the following activities but not limited to: -

1. Check for rectification of fault to avoid repeat faults.
2. Protection for the exposed OFC due to various reasons.
3. Laying of Optical Fiber Cable on overhead for the sections, identified by RJIL.
4. Cable exposed due to soil erosion.
5. Re-splicing of fibers for improving the fiber performance.
6. Verification of route and joint indicators.
   * 1. Re-laying of Optical Fiber Cable (OFC) routes: -

Even after best efforts of SPs, if Fiber cables get damaged in the operation, then SP is expected to re-lay the OFC route including laying of ducts, pulling OFC and jointing of the cable with the prior approval of CTO.

* + 1. Preventive maintenance document for FTTx has been attached as per Annexure – IV

**PM Work Order Structure:**

1. PM frequency is modified as per table below in view of network category, criticality and requirements:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Particulars** |  | **Current PM Frequency** |  | **Revised PM Frequency** | **Remarks** | **Report** |
| RFMS Connected Span/Link | NA | NA |  |  |
| Span/Link (Without LM) | Monthly | Monthly | WO based | System |
| Last Mile (< = 1.0 Km) | Yearly |
| Last Mile (1.0 - 2.0 Km) | Half Yearly |
| Last Mile (> 2.0 Km) | Quarterly |
| RITL | Monthly | Manual | Daily manual reporting |

1. DFM Testing Methodology revised from “Bi-directional OTDR + LSPM” to “Uni-directional OTDR only”. No LSPM, same will continue. No change in test method.
2. PM work orders will be issued by JIO in advance on monthly basis. Frequency of PM WO's on spans will be basis network category, criticality and requirements (Spans under Quarterly/ Half yearly/ Yearly repeat WO could be issued if required). Moreover, JIO reserves the right to get all spans tested on monthly basis in line with contract.
3. RITL span list will be circulated on monthly basis for PM testing on manual basis till database is in GIS.
4. SP will be eligible for billing for complete Fiber scope less WO not executed on monthly basis.
5. Sample audit will be conducted on completed PM WO's . In case WO fails in audit corresponding spans will not be billable/ PM amt. will be recovered and SP to take corrective / administrative action on resources concerned.

**PM Work Order Structure : F & D**

PM frequency is modified as per table below in view of network category, criticality and requirements:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SN | Particulars |  | Current PM Frequency |  | Revised PM Frequency |  | Remarks | Report |
| 1 | FDC/FAT/OTB/S1/S2 | Half Yearly | No Change | WO based | System |
| 2 | F&D cable | Quarterly |
| 3 | S1/S2 High Loss / Degrade | Incident Based | CM TT |
| 4 | Route Surveillance of F&D cable | Need basis | No Change | Manual | Daily manual reporting |

1. In old Contract PM identified on the field survey based on the feedback. No WO for PM was released to the field. Excel based tracking was done
2. In the revised SP contract, SAP PM WOs are released FSA wise by JIO in advance on monthly basis.
3. WOs TECO in SAP will be considered as WO closure compliance.
4. Work Orders assigned for a particular month has to be completed in that month only.
5. In case WOs not closed during month, same will be carried forward to the next month. OPEN WOs will not be available for closure after 3 Months for Sr no2 and after 6 months for Sr no1
6. SP will be eligible for billing for complete FTTx scope less WO not executed on monthly basis.
7. No Payout for the FSA/Fiber KMs Cumulative OPEN WOs for the Month.
8. Route Surveillance for F&D cables to be done by SP on need base. Wherever infra expansion activities are happening >180 days, additional resources will be supported as per contract .
   * + 1. **Regular Dark Fiber and Duct Maintenance**
     1. On monthly basis Dark fiber testing Workorders (span/Link wise) shall be generated for fiber network. For core, collector and metro core links Remote fiber monitoring system is under deployment. No manual fiber testing work orders will get generated for such links as they are continuously getting monitored on LIVE basis. SP is not required to conduct any dark fiber testing for such links. Only in case of Fault reported from NOC SP team to correct the same within 15 days of reporting. For all other type of traffic links SAP work order will be generated and SP to conduct the Unidirectional OTDR test for all links. Compliance calculations are as per KPI/SLA table.
     2. SP will always maintain and keep all DARK ducts intact and usable. Only specified ducts to be used for its entire life; unless changed / approved by CTO. No intermixing of ducts is allowed; deviation will have serious penalty. RED duct is identified as DUCT in which Enterprise and FTTX OFC is to be blown in future. In case this duct is not found to be fit for blowing then SP to rectify the same at his own cost within the timeline as specified by RJIL.
     3. SP to conduct Rodder / DIT test on need basis (with separate commercials) ON ALL DARK DUCTS on all fiber routes to ensure health of all dark ducts are maintained in healthy condition and submit the report to CTO.

### Corrective Maintenance:

* + 1. OFC cut / fault restoration / repair / rectification, as per RJIL spec / Standard operating procedure (SOP), shall be done within the defined MTTR / SLA. FRT (GPS enabled) shall be made available 24x7 for the same.
    2. The OFC cuts can happen due to the activities of various agencies as listed at clause 1.10 above or due to any other reason. In spite of the efforts of the SP to prevent the cable cuts, if cable cuts occur, the SP shall restore the fault within the permissible time period as per defined KPI / SLA. The fault restoration shall be done on a permanent basis.
    3. However, it may not be practical to do permanent restoration of all cases. Wherever it is not able to restore the fault permanently, temporary restoration can be resorted to avoid traffic loss at SP’s own cost and permanent restoration can be done subsequently by the SP.
    4. The corrective maintenance activities to be carried out by the SP are broadly classified as under:
       1. Localization of OFC break.
       2. Obtaining permissions from the concerned local authorities.
       3. Excavation of earth to expose cable for fault rectification.
       4. Identification of broken OFC ends and laying additional OFC.
       5. Laying of required length of OFC with protection wherever required.
       6. Testing of fibers.
       7. Preparation of jointing pit and back filling of pit with Sand, soil etc.
       8. Splicing of cable.
       9. Protection arrangement for OFC joint.
       10. Planting of cable Route indicators and Joint indicators (supplied by RJIL).
       11. Final Testing of OFC splices loss at the joint from the terminal station using power meter.
       12. Any (open) Trenching, Aerial cabling, Ducting and Pulling OFC, back filling, splicing, testing, installation of MH/HH, Joint Closures etc. for cut restoration / rectification by permanent method. Primarily all faults shall be restored by single joints.
    5. On receipt of information of OFC fault, the Fiber Restoration Team (FRT) shall move immediately for locating and rectifying the fault. The working fibers shall be restored first, followed by others.
    6. Restoration of all systems / fibers in the **Optical Fiber** (**OF**) cable shall be ensured **as per defined in Annexure - II** and in extreme cases only where the permanent restoration is not possible immediately, temporary restoration shall be made with the approval of RJIL. However, permanent restoration shall be done during night hours after getting maintenance shut down within 10 days of temporary restoration. The SP has to submit a detailed report regarding the cause of fault, restoration details as per SLA to the designated officer of RJIL.
    7. During restoration, the affected/damaged pole shall re-installed. Also, for any temporary pole installations viz Bamboo etc. necessary arrangements to be made.
    8. Any Fault restored due to urgency to be converted back to permanent within 7 Days’ time. At any point of time maximum 5% cases (at MP level) may remain open on temporary basis. Non-compliance will be monitored through weekly reports and take actions accordingly. In case conversions are not executed in a months’ time the Jio may get it restored from external vendor expenses against the restoration by external vendor and amount will be debited to SP.
    9. **Permanent Restoration means:** Fiber fault restoration in the any of the approved construction methodology i.e. Open trench, HDD, MT or structured aerial. Also, all duct coupled (including dark ducts), end plug, simplex plug fixed, all fibers spliced (Live as well as Dark fibers), Joint closure properly sealed, Sufficient cable loop availability, manhole installed, JC and cable loops kept inside manhole and manhole sealed as per process.
    10. For safeguarding works against cuts, conversion of Temporary faults to permanent restoration, Duct Health, High loss removal etc. SP to deploy separate dedicated teams.
    11. Fiber faults generated due to poor quality of workmanship by SP Resources (Splicer) namely Patch cord issues, Tray joints, break inside closure, Vehicle cut due low hanging cables, High losses are not acceptable. All such poor-quality restorations to be corrected within 7 days’ time.
    12. During the corrective action by the SP, in case other service cables/utilities like existing OFC, local telephone copper cable, water pipes, electricity cables, any other private/ public Property etc. are damaged, the penalty/ compensation if any, shall be borne by the SP only (SP has to pay all the damage claims on his own, RJIL will not pay for this). The restoration of all such damages caused will be rectified immediately by the SP at his own cost. However, this shall not hamper the RJIL OF cable restoration activity.
    13. HDD and ground penetrating radar (GPR) survey jobs though in SP’s scope, will be paid extra with only prior approval from CTO. SP has to execute the repair work with full responsibility and without excuses and should convert back to HDD within 15 days of temporary restoration. Incase if the need arises SP may have to conduct GPR survey as well. All Such integrations /splicing jobs through planned events will be done by the FRTs. In case SP do not convert temporary restored cases to permanent within 1 month. Amount of Rs 10,000/- per case will be retained and in case execution is completed by SP within 3 months’ time the retained amount will be refunded however in case work not executed retained amount will be Forfeited. Jio has full right to get it converted from external vendor. Expenses against the same shall be debited to SP.
    14. SP shall ensure availability of FRT all the time and maintain it as mentioned below, but not limited to.
        - SP shall ensure FRT team and vehicle allocation guidelines are followed as defined in Annexure V
        - Vehicles will not have driven more than 2,00,000 Kms / 5 years old, at any point of time. They will be replaced on completion of 2,00,000 kms run / 5 years of ageing; whichever is earlier.
        - All vehicles are to be of SUV type with valid commercial Registration, Insurance and driver license. GPS for tracking vehicles is mandatory Access to monitor the movement to be provided to CTO of RJIL.
        - FRT Vehicle Tracking:
        - SP to install Jio recommended vehicle tracking device with necessary software and subscriptions at all FRT vehicles.
        - All necessary charges for the same shall be borne by SP.
        - SP shall ensure device is operational and connected to central tracking system all the time.
        - SP to ensure the visibility of the same in tracking application with the CTO from time to time.
        - It should be ensured that the vehicle to be available on 24x7 basis however it should be ensured that driver duty does not exceed 12 hrs in a day to avoid any incidences.
        - During Maintenance period of the vehicle, SP will arrange replacement. For material movement from SP warehouse and reverse has to be provided by SP. It is suggested to deploy one material vehicle at every 1000kms of scope. This deployment can take care of 4 FRT teams. Unless Material vehicle dimensioning is Specified separately in other section ( 25.1.6) of this document this will not hold true.
        - Over the period, SP to move from Diesel vehicles to Battery operated Electric SUVs.
    15. Heavy equipment:

The service provider (SP) holds the responsibility for arranging heavy equipment, including but not limited to JCB, Cherry Picker, and Cranes, for deployment in telecom infrastructure maintenance as and when required, with prior approval from CTO. The charges will be agreed, approved and borne by RJIL prior to commencement of work. (Any work without written approval/WO will not be paid).

* + 1. Damages/ Theft of Optical Fiber Cables

1. Incident Report for all damages/ theft of Optical Fiber Cables shall be submitted by the SP to the concerned Police station through the designated officer of RJIL and photos taken immediately on the spot and submitted to RJIL. FIR shall be taken from concerned police station and submitted to RJIL designated officer. The SP shall own a camera with a provision for date and time stamp for the photos taken. The necessary documentation required and compiled by the SP including investigation report is to be submitted to the RJIL designated officer.
2. If any service rendered by the vendor is found defective or abnormal delay, the same shall be got completed from outside or RJIL source and the cost of any such work made by RJIL shall be deducted from the amount payable to the SP.

# SP’s Support Organization for O&M of the fiber network:

For maintaining OFC Network within the required KPI/SLA as defined in Annexure -II, SP has to deploy Fiber Restoration teams (FRTs), patrollers and route guards. SP may increase/decrease deployed resources so as to meet targeted KPI/SLA requirement (as per Annexure II). Details of Manpower deployed has to be agreed with State CTO on quarterly basis and signed one month in advance of the start of next quarter. Manpower signoff will also include bench strength signoff basis on quarterly attrition rate. In case performance is not getting met resources are required to be augmented. In intracity majority of the fiber is laid through HDD methodology, thus surveillance/regular patrolling is not envisaged and will be limited to the emergency requirements arising out of any work being done by third party, utility agencies etc.

To deliver the above services, SP must have.

1. Resources like qualified, skilled, trained and experienced manpower (refer **Annexure-V**) along with mobile devices having Android OS, dual SIM (Jio SIM and other operator SIM), GPS enabled 4G/5G smart phones (for all SP personnel except helpers), Power Bank for keeping the mobile recharged; Laptop for Supervisors (for remote login), conveyance / transportation (including road worthy two-wheelers for patrollers/TRT and commercial vehicles for FRT/material movement). FRT vehicle has to be of SUV type (Bolero, TATA Sumo, Scorpio, Mahindra Xylo or equivalent etc. Alternately, RJIL, at its sole discretion, may decide to give away the phones and Jio SIMs with preloaded Apps and charge back the requisite amount from SP. Dedicated material carrying vehicle also is required to be provided at each MP location.
2. Safe and secured Warehouse / storage space for RJIL FIM. Warehouse (**WH**) area for Open and closed to be arranged by SP and provided to RJIL while submitting proposal.
3. O&M tools & tackles and Hand tools (Refer **Annexure VI**). These will be calibrated at accredited centers with traceability as per the defined timelines.
4. Logistics for spare parts management, material handling as required for smooth execution of SP scope of work.
5. All safety appliances and PPEs as per the list to comply with all safety measures.
6. Team Composition will be as per Annexure V.
7. FRTs are critical for maintenance of OFC network, non-availability of FRTs may attract below penal action after three incidents in a month. Details are given below,

* If committed number of FRT vehicle (inline to definition of FRT Scope) not available at site, Penalty of Rs 3,000/- per day per FRT will be deducted for all such instances.
* In case of non-compliance FRT team configuration, per day penalty will be as follows:
  1. Main Splicer/Assistant splicer is not available - Rs 1,000/day
  2. Labour is not available - Rs 750/Labour/day
  3. In case of FTTx team is not available - Per day Rs 2,500 will be deducted.
  4. Penalty of Rs 1,500/day will be applicable if FTTx maintenance engineer is not available & Rs 1,000/day penalty in case FTTx maintenance technician is not available.

Manpower deployed has to be agreed with CTO on quarterly basis and signed one month in advance of the start of next quarter. Over and above sign off only in very exceptional cases where major infra expansion works (like road expansion, water pipeline work, metro etc.) which may continue for > 180 days on the same spot/location (though the infra work might continue beyond 180 days progressively at different spot/location) , RJIL may either support a) by giving extra FRT, Fiber Guards and Labor or b) RJIL will place additional work order and request SP to deploy extra FRT, Fiber Guards and Labor with approval of CTO and State / NHQ Leadership team as intimated by CTO in writing. These resources are required to agree along with quarterly manpower signoff in advance before start of each quarter.

The SPs which are also rendering project services to RJIL will ensure that there are separate teams and supervisors deployed, each for project and O&M activities.

Multi skill approach to be followed for technician. Technician also to be imparted training to work at height.

SP to depute one Key Account Manager (KAM) who will operate as a single point contact from their end.

# SLA and KPI compliance for Fiber Networkl

SP shall ensure that SLA and KPI for support activities are met as mentioned in Annexure II.

# Scope of Work for O&M for Tower & Facility sites:

Purpose of this section:

This section details out the following information so as to enable the SP to fulfill his obligations under this Scope of Work:

* Details about the Tower & Facility sites. e.g. small and medium facilities
* Activity to be carried out by SP.
* The SP’s support Organization / team required.
* Service Level Agreement (SLA) and Key Performance Indicators (KPI) that are expected to be met.

# Details about the Tower & Facility sites:

The various kinds of utility, infrastructure, field electronics equipment at Tower & Facility are covered under the scope and are detailed in Annexure I.

RJIL has constructed various types of infrastructure to operate it’s network, which can be broadly identified as following facilities.

1. Tower
   1. GBT (Ground Base Tower)
   2. GBM (Ground Base Mast)
   3. RTT (Roof Top Tower)
   4. RTP (Roof Top Pole)
   5. IP Colo Sites (Infrastructure Provider Co-Location sites)
   6. Indoor & Outdoor - Small Cell & Wi-Fi
   7. COW (Cell on Wheel)
2. Facility (Unmanned Sites)
   1. Aggregation Nodes (AG) - AG2(Metro), AG2(NLD), AG2, AG1, AG1(NLD), AG1(OLT), ILA

# Activities to be caried out by the SP:

SP shall ensure network uptime of 99.999% for all the Tower & facility sites by performing Preventive & Corrective maintenances.

The primary focus is to keep the equipment in healthy condition and to avoid any failures, for which SP has to employ adequate resources to perform regular maintenance of sites & other innovative method.

SP has to keep good rapport and co-ordination with all Government and Non-Government bodies / authorities and also farmers/ landowners to keep track of information like their plan / unplanned activities like power outages or fluctuations for the site areas, which may cause damages to the equipment.

The scope of services comprises of Operation and Maintenance of sites and its associated utility & electronic equipment connecting to other installed facilities like tower AG2, AG1, ILA, CSS, gNodeB (5G NR), eNodeB, WI- FI, SMALL CELLS sites / Locations, IBS (In Building Solutions), Microwave, UBR (Unlicensed Band Radio), Transport or any other termination point / any combinations.

SP shall perform the following site HOTO (Hand Over & Take Over) activities:

* SP shall takeover of sites inclusive of it’s electronic & Utility equipment with necessary guidelines from Project / Construction / Deployment team.
* SP shall Inspect and audit the facilities constructed and prepare a punch list if any deviation is observed as per the RJIL HOTO documents. Critical punch points must be listed and followed up and liquidated through local construction team as per the HOTO procedure, as intimated by CTO. HOTO guidelines will be shared post award of contract.

SP field staff to provide access support and supervise the site for any activity at site by third party (Like Sharing operator, Project team, External agencies etc.) with approval by RJIL representative. Details of escalation matrix of OEM will be shared by RJIL to SP post contract award.

SP team is responsible to integrate new sites (Infra i.e. both Fiber, Utility & Electronic) in existing LIVE network, offered by RJIL Construction team, through Planned Event from RJIL NOC within 7 Days of offer of site by construction team.

Operation and Maintenance of all the equipment:

* Utility Equipment like Disel Generator (DG), Precision Air Conditioner (PAC) / Heating, Ventilation, and Air Conditioning (HVAC) / Evaporative Free Cooling (EFC), Switch Mode Power Supply (SMPS), Battery Bank, Transformers, etc.
* Electronic equipment like Baseband Unit, Remote Radio Unit, Antenna, accessories along with GPS, parabolic antenna and microwave radio etc.

SP shall provide support for activities like field level services for Transport/Backhaul and Radio network, Hard resetting, Card replacement, support for Drive test, Antenna adjustment, Feeder cable etc.

For detailed activities to be performed Refer Annexure IV. The list is indicative only and not exhaustive (i.e. but not limited to).

SP team shall adopt implementation of new applications / new NW upgradations / optimizations / process changes as when required.

### Preventive & Scheduled Maintenance:

* + 1. Ensure Site Hygiene and Cleanliness:
       - SP to ensure that the sites are vegetation / garbage / debris free for easy access.
       - SP is responsible for maintaining cleanliness in equipment, panel rooms, shelters, and site premises, providing documented evidence with before-and-after photographs in applicable applications.
    2. Conduct Pest Control Activities:
       - SP's duty includes conducting pest control activities, such as beehive and bird nest removal and preventing ant/rodent damage, with a requirement for photographic evidence in applicable applications.
    3. Implement Monsoon Protection Measures:
       - SP is tasked with implementing monsoon protection measures using FIM materials provided by RJIL. Any other consumables required shall be in scope of SP.
    4. Manage Cable Routing and Dressing:
       - SP is responsible for ensuring proper cable routing, dressing, and labeling at the site.
    5. Perform Detailed Cable Inspection:
       - SP's duty involves conducting a thorough inspection & reporting of cable routings, earthing cables, patch cords, SFP modules, connectors, labeling, and dummy plates.
    6. Analyze High Consumption Cases:
       - SP is responsible for analyzing cases of high Consumption Per Hour (CPH) and submitting weekly cause analysis reports with recommendations to Jio NHQ and Circle team.
       - SP partner shall conduct surprise audit for all such high CPH cases to identify exact reason and effective action plan to be shared with RJIL.
    7. Accountability for Power Theft:
       - SP is accountable for preventing and addressing any unauthorized power theft (AC or DC) from the site.
    8. Manage Diesel Filling and Beat Plan:
       - SP's duty includes effective management of beat route plans to reduce diesel filling costs, ensuring timely data entry in the Integrated Energy Management **(IEM)** portal.
       - If fuel at a site is not filled for two consecutive months, then it will be taken off the beat plan.
       - Fuel filling service charges will be payable only for those sites, where re-fueling activity happens at least once in a month.
       - RJIL, at its sole discretion, may allocate the activity of fuel filling to a third party or any of its associate company. In such cases fuel filling charges will not be applicable. However, necessary coordination will be done by SP and the fuel reconciliation responsibility will lie with SP.
       - SP's duty involves managing power and fuel (energy) at sites.
    9. Collect and Submit EB (Electricity Board) Bills (on need basis):
       - SP is responsible for collecting and submitting electricity bills within SLA, avoiding penalties, and ensuring timely payment by collecting Demand Draft from Jio and submitting to EB.
       - Non-compliance on SLA will attract penalty. In case of online bill facility available, SP will download the bill and make entry in the IEM platform. SP partner must ensure no penalty on account of delayed payment / EB disconnections due to delay in Bill entry in IEM platform. In cases of delay in payment from RJIL, SP will escalate to CTO team.
    10. Handle EB Disconnection and Reconnection:
        - SP is tasked with expediting end-to-end processes for EB disconnection and reconnection, providing a weekly action report.
    11. Incident Reporting:
        - Submitting incident reports towards filing of FIR by Police for theft, damage, forceful entry, or unlawful activities, non-permitted entry by miscreants.
        - CTO should be informed of any misconducts or undue incidents.
        - No physical security deployment is envisaged.
    12. Arrange Mobile DG Sets:
        - SP is responsible for arranging mobile DG sets on a chargeable basis within specified timeframes and handling the arrangement of vehicles for FIM DGs.
        - Arrange DG in 4 hrs. for Intracity route & 6 hrs. for NLD route as and when required with prior approval.
        - Rental DGs arrangement is in SP scope in case FIM DGs are not available in adequate quantity. Power supply cable from DG to site and operation is in the scope of Rental DG supplier.
    13. Fuel Responsibility Oversight:
        - SP to oversee fuel and its filling for DGs issued as Free Issue Material (FIM) by RJIL, while rental DGs' fuel is provided by RJIL in accordance with Run Hours.
    14. Manage Power and Fuel for IEM Portal:
        - SP is responsible for managing power and fuel (energy) at sites by providing data for entry into the Integrated Energy Management (IEM) portal.
        - Upon implementation of mobile Application, all data to be directly uploaded in the system by SP.
    15. Control Maximum Demand and Power-Factor:
        - SP actively controls Maximum Demand and Power-factor based on guidelines from the Chief Technology Officer (CTO). And ensures to avoid the penalty for Power-factor.
    16. Heavy equipment:
        - The service provider (SP) holds the responsibility for arranging heavy equipment, including but not limited to JCB, Cherry Picker, and Cranes, for deployment in telecom infrastructure maintenance as and when required, with prior approval from CTO. The charges will be agreed & approved by RJIL prior to commencement of work.
    17. Provide Telecom Equipment Maintenance:
        - SP's duty involves providing on-site support for any telecom special events and ensuring the smooth functioning of all equipment.
    18. Conduct Technical Infrastructure Checks:
        - SP routinely conducts electrical system checks, maintains In mast Equipment (**IME**) / Out Mast Equipment (**OME**), and monitors battery and power supply for optimal performance.
    19. Oversee Fire Detection and Security:
        - SP is responsible for routine inspections of fire detection systems, verifying the effectiveness of security measures, and conducting periodic checks on EMF signage and security cameras.
    20. Maintain Documentation and Reporting:
        - SP's duty involves maintaining meticulous documentation, preparing detailed reports, and assessing travel time between locations for efficient planning and reporting.
    21. Conduct Miscellaneous Checks:
        - SP oversees cooling and environmental checks, conducts visual inspections for site conditions, and performs transformer inspections as part of routine checks.
    22. Perform Additional Technical Checks for various equipment & cabinets at sites:
        - SP verifies LED status, conducts filter maintenance, inspects cable routings, and checks power and grounding using a multimeter.
    23. Ensure Equipment Maintenance and Cleaning:
        - SP ensures proper functioning by checking power cards, earthing, and power cable termination, removing unused cables, and inspecting for corrosion.
    24. Conduct Corrosion Checks and Surge Protection at equipment & cabinets:
        - SP actively checks for corrosion on or around equipment & cabinets and regularly inspects surge protectors or power strips for signs of damage.
    25. Preventive maintenance document for Power and Utility has been attached as per Annexure - IV

### Corrective Maintenance:

Corrective Maintenance (**CM**) activities are generally performed against Trouble Tickets (**TT**) generated & assigned by NOC. The objective is to achieve the network uptime of 99.999%.

SP shall perform the Corrective Maintenance (CM) of utility and other site equipment, which includes alarm management and First Level Maintenance (FLM) of the equipment by replacement of consumables (SPD, fuse, MCB, filter etc.), SMPS, Rectifier, Battery Bank etc.

Separate CAMC have been awarded on OEMs (Original Equipment Manufacturer) for which SP will coordinate and support OEM as required, matrix is attached in the Annexure IV. In case of equipment alarm/failure, SP will contact and share observations with OEM to seek guidance of corrective actions.

With telephonic support from OEM, SP will try to resolve the issues. In case issue is not resolved through telephonic support, OEM will visit the site to resolve the issue for which SP will coordinate/provide support. SP to understand the AMC/CAMC scope of equipment and perform activities as specified in Annexure IV of activity list. The list is indicative only and not exhaustive. In case of any dispute in terms of activities to be performed by SP/OEM, SP to seek guidelines from CTO.

Corrective maintenance activities broadly identified below:

* + 1. Telcom Infra Maintenance:
       - The Service Provider (SP) is committed to executing a comprehensive set of corrective measures on telecom infrastructure equipment, encompassing RAN, CSS, MW, and UBR components. Corrective measure includes, but are not limited to:
       - Hardware hard resets and replacements
       - Antenna alignment
       - Cable change and Connectorization
       - Optical and DC power measurements
       - Handling of tools and Test, Measurement, and Integration (TMI) equipment
       - Support for RF optimization
       - Management of spare parts
       - The SP assumes responsibility for corrective maintenance like as executing actions directed by the Network Operations Center (NOC), resetting or replacing hardware and cards, replacing faulty cards with healthy spares, bringing faulty modules to the Central Maintenance Point (CMP), providing data for SAP system consumption booking, conducting Node Hygiene checks, clearing unwanted alarms, cleaning air filters, FAN modules, and RRF units if present, and checking the health status of standby modules. Any other corrective or preventive activities necessary for the network's health, including 4G and 5G equipment, will be communicated by the NOC.
       - Furthermore, the SP is tasked with executing corrective actions for general facility maintenance, covering, cleaning, and replacing patch cords, eCPRI/CPRI cables, AISG Cable, and power cables in case of faults. Proper routing, labeling, and tying should be ensured after replacements. The SP is also responsible for replacing air filters, fan modules, cards, hardware, RRH fans, and SFP modules in case of faults. Support for Network Element (NE) visibility to the NOC and any configuration implementation under NOC guidance, including console usage, is expected. Coordination with NOC for fault clearance, active antenna maintenance for 5G and RF antennas, electric and mechanical tilt adjustments, antenna height alterations, and antenna replacements are part of the SP's corrective actions. Additionally, corrective repairs & replacement support for Outdoor Small Cell (ODSC), IBS, Wi-Fi Access Point, Switches and all such site equipment against alarms or Trouble Tickets (TT) are integral to the SP's responsibilities.
    2. Disel Generators (DG) Maintenance:
       - The SP is mandated to conduct corrective actions on DG to ensure uninterrupted power supply. This involves simulating alarms, checking connections and sensors, validating DG Automatic Mains Failure (AMF) function, inspecting air systems and filters, assessing coolant levels, monitoring radiators, belts, and fans, examining cooling towers, and confirming the operational parameters of the DG system. Additionally, the SP is responsible for lube oil top-up, supervising diesel filling, and addressing any faults that may impede the DG's performance.
    3. PAC/EFC Maintenance:
       - Corrective maintenance for Precision Air Conditioners (PAC) and Evaporative Free Cooling (EFC) involves a meticulous set of tasks. The SP is required to conduct trials of standby PAC, clean filters and coils, check blower and condenser fan rotations, inspect refrigerant lines for leakages, ensure proper sealing, and validate various operational parameters. Additionally, the SP must address active alarms, assess the condition of evaporator and condenser coils, inspect the drain pipe, and monitor insulation in the case of Chilled Water units.
    4. Switched Mode Power Supplies (SMPS) Maintenance:
       - SMPS form a critical component of the infrastructure, and the SP is charged with corrective maintenance tasks to ensure their optimal functionality. This includes checking and cleaning the rectifier fan tray, verifying Surge Protection Device (SPD) status, resolving alarms, confirming rectifier functionality, validating SMPS controller software versions, recording operational parameters, checking battery configurations and communications, ensuring Low Voltage Disconnect (LVD)/Battery Low Voltage Disconnect (BLVD) settings, and integrating with the monitoring system (Zabbix). Hardware replacements for rectifiers, controllers, and communication modules are also part of the SP's duties.
    5. Battery Maintenance:
       - The SP must implement corrective measures for batteries to guarantee their reliability and performance. This encompasses checks for water ingress and leakage in battery modules, monitoring abnormal temperatures, inspecting Battery Alarm LED status, validating the mode of operation (Float/Charge/Discharge), assessing battery voltage, State of Charge (SOC), and temperature, verifying battery communication, power, and earthing cable connections, ensuring power terminal shrouding, replacing fuses, conducting battery discharge tests, and coordinating the collection, movement, and replacement of batteries. The SP is also tasked with verifying the make and type uniformity of batteries across the site.
    6. Outdoor Cabinets (ODC) Maintenance:
       - Corrective actions for ODC involve a multi-faceted approach. The SP is required to inspect the ODC for rusting and damage, validate door closing and lock conditions, check SAS lock status, examine sealing and Cable Roxtec conditions, assess rubber gaskets and grommets, inspect for leakages, clean filters, check fan noise levels, inspect the fan's physical condition, conduct ODC cleaning, perform housekeeping in the vicinity of the ODC, test smoke detectors, and address any surface maintenance requirements, including scrubbing and applying primer and paint at locations where the paint is peeled off.
    7. Earthing Maintenance:
       - Ensuring a robust earthing system is crucial for the overall infrastructure integrity. The SP is mandated to conduct corrective actions for earthing, including verifying the availability of earth pits and electrodes at the Earthing and Bonding Distribution Point (EB DP) structure, checking earthing at various points, including equipment, earth pit, transformer body, and lightning arrestors, validating transformer neutral earthing, ensuring proper connections at earth electrode bolted joints, recording voltage between neutral and earth, checking earthing bonding at all points, confirming DG neutral earthing, validating earth connections of ODC and cable racks, checking interconnection of all Earthing Points (EP), Telecommunications Grounding Busbar (TGB), and Tower Mast Grounding Busbar (TMGB), inspecting and cleaning TMGB and TGB support insulators, confirming the connection between Surge Protection Devices (SPD) and earth flats, validating earthing between positive bus and TGB, checking the earthing of Low-Tension (LT) panels and AC Power Distribution Board (ACDB), DC Power Distribution Board (DCDB) inspecting riveted and bolted joints for proper earthing, and opening fasteners and cleaning earth strip joints.
    8. Tower Maintenance:
       - Maintaining the structural integrity of the towers is imperative for the safety and functionality of the entire infrastructure. The SP is required to perform corrective actions, including checking bolt tightness, inspecting foundation integrity and foundation bolts, validating the status of aviation lamps and Electromagnetic Field (EMF) signage, fixing or replacing them if damaged or missing, checking the condition of the Ground Based Mast (GBM) door gasket, ensuring the health of the energy meter and conducting site hygiene checks.
    9. Network Infrastructure Corrections:
       - The SP is tasked with addressing specific challenges in the network infrastructure. This includes swiftly identifying and addressing power failures through Level 1 checks on power sources, circuits, and distribution systems. In case of electronic and utility equipment malfunctions, the SP is to coordinate to conduct thorough diagnostics on equipment such as transceivers, radios, base stations and DG etc.

# The SP’s support Organization for O&M of Tower sites

For maintaining Tower sites within the required KPI/SLA as defined in Annexure -III, SP has to deploy Tower Restoration teams (TRTs) and other adequate resources. SP may increase/decrease deployed resources so as to meet targeted KPI/SLA requirement as per Annexure III.

Minimum required manpower estimate as per RJIL is shared in Annexure-V

Details of Manpower deployed has to be agreed with State CTO on quarterly basis and signed one month in advance of the start of next quarter. Manpower signoff will also include bench strength signoff basis on quarterly attrition rate. In case performance is not getting met resources are required to be augmented.

# SLA and KPI for Tower Sites

SP shall ensure that SLA and KPI for support activities are met as mentioned in Annexure III.

# Mandatory Requirements

1. RJIL CTO / O&M Lead will assess all resources except labors.
2. SP will mandatorily conduct background check for all Technicians before recruitment. No resource will be hired, who has been removed from any other organization on integrity issues, misbehavior, unionism, or FIR filed cases etc.
3. SP will submit a copy of formal referral check and identity & address proof of all technicians hired by SP, to RJIL state team for records. Aadhaar Card is mandatory for all SP personnel for onboarding.
4. Any misconduct by SP staff in the form of negligence causing damage or loss to network functioning, assets or property of RJIL, false reporting, involvement directly or indirectly in acts of thefts, pilferage, conspiracy or abetting to theft, tampering, adulteration, damage or sabotage etc. will lead to penalty, recovering the amounts towards the damages caused, termination of contract, de-registration and blacklisting from all Reliance group companies.
5. SP will ensure that all SP personnel are medically fit to execute their work. SP is urged to have medical fitness checked for the field staff periodically. SPs will ensure that Riggers before the Work at Height training, are free of any illness such as high BP, diabetes, Vertigo (height phobia) and any hearing, vision (including color blindness), breathing, limb mobility problems / issues. It is preferable to have medical fitness certificates especially for riggers.
6. It will be the responsibility of SP to proactively diffuse, handle, manage and resolve any dispute with their Employees, including Labor Unions. The SP will not involve Reliance management or Employees towards any such resolution. Disbursal of annual bonus or giving away annual salary increments will be the sole responsibility of the Service Providers. The financial on-cost arising out of any such issue will be borne by the SPs.
7. SP will mandatorily provide all required IR compliances for all their employees working for RJIL and the details of whom are mentioned in RJIL system. No form 11 will be accepted. It is made explicitly clear that IR compliances are not required only for SP’s field employees working for Jio, but the same is required for all employees available in VLMS system.
8. SP to maintain adequate bench strength against normal attrition. This bench strength will be trained and in ready to deploy condition. SP will also take proactive measures to keep attrition under control.

# Escalation Matrix for SP

Escalation matrix for any operational issues related to SP field personnel.

|  |  |  |  |
| --- | --- | --- | --- |
| **Level** | **Position** | **Resolution Time** | **Organization** |
| **1** | SP Supervisor | Within 24 hrs. | SP |
| **2** | O&M Engineer | Within 48 hrs. | RJIL |
| **3** | O&M Lead | Within 72 hrs. | RJIL |
| **4** | CTO | Within 96 hrs. | RJIL |

# Subcontracting

Back-to-Back / End to End Sub-contracting is strictly not allowed. But if at all any minor sub- contracting (Hiring of Labor, vehicles, WH space etc.) is to be done, then it will be done only and only if approved by the CTO in writing.

# Exit Management Plan

Termination of contract can be initiated by Company with notice of not less than 15 days to the Service Provider unless the Contract specifies otherwise.

# Contract Termination

Some of the grounds for termination of the O&M contract (includes & is not restricted to):

* Consistent and continued non-delivery of KPI targets (3 months data analysis)
* Integrity issues & Non-adherence to RJIL policies/procedures
* Any misconduct by SP staff as defined in Annexure XI
* Based on RJIL risk assessments
* However, neither RJIL nor the Company shall be bound to disclose any risks assessed or to give any reasons in respect of the same.

# Network Mitra

* SP to execute engagement and management of Jio Network Mitra (NM) on need basis for monitoring / securing of unmanned sites / assets of RJIL as detailed in Annexure – VIII.

# Automation Tools

The service provider (SP) is tasked with ensuring adaptation and compliance to automation tools/platforms. These automation tools are expected to evolve over time, requiring the SP to seamlessly integrate new applications, platforms, and tools into their operations. Additionally, the SP must be prepared to submit data in updated formats as necessitated by these evolving automation tools. Specific details regarding the automation tools are provided in Annexure - IX.

* Physical verification of As-built drawings (ABD) & updation in GIS Application, GIS update & Fiber port details updation after every addition of Utility equipment in the system and after every OFC repair / shifting / addition, new assets addition or any change in the existing GIS data.
* During fault, Fiber or eNodeB or gNodeB, SP will get automated work order from NOC to respective field Staff on their Mobile mField App. SP must follow the work order closure procedure as per RJIL process. In case of non-closure in mField as per workflow, Fault will be treated as open and KPIs computed accordingly.
* SP to ensure healthiness of integration of DG/SMPS connected on Zabbix platform and maintain as follows:

1. All configured parameters Consistency & Validation on regular interval for all Zabbix connected sites.
2. Zabbix disconnected equipment: Re-connection and validation of all disconnected equipment (DG, Battery, SMPS) within 24 Hrs.
3. Zabbix disconnected Sites: Re-connection and validation of all disconnected sites within 24 Hrs.
4. For OEM dependent issues: Logging complaints with OEM and Follow-up for resolution.

# Quality

* 1. All the audit observations made by RJIL or any other appointed agencies to be liquidated by SP in consultation with EIC/CTO. Any corrective action required for the work already executed by SP will be attended at FOC basis. Any Extra work will be done on chargeable basis.

SP to close all audit findings observations within 7 days and implement horizontally across all MPs. Further the observed issue during audit is required to be checked, closed and confirmed by SP within 1-month time for all balance scope maintained by him. In case repeat observations were found, SP will be penalized for non-compliance on case-to-case basis depending on the impact.

e.g.

* + 1. Tools and PPEs non availability
    2. Material reconciliation at SP WH (declared stock vs Physical Stock) to be completed within 30 Days of audit findings. Failing which the differential cost will be deducted.
    3. Non-availability of WH (open and closed), Improper storage.
  1. SP to ensure quality work as per RJIL specification by deployment of skilled and trained resources.

# Compliance:

The following list enumerates the compliances that the service provider (SP) must ensure. This list is indicative and not exhaustive. The SP is obligated to adhere to all statutory requirements mandated by government bodies and comply with the updated guidelines provided by RJIL as per the evolving standards.

* Driver License (minimum 3 years’ experience, Permanent License clean record and medically fit). For hilly terrain driver should have driving experience of hilly area for at least 1 year.
* RTO Registration Certificate (Commercial)
* Comprehensive Insurance Certificate
* PUC Certificate
* Vehicle permit, if applicable.
* Vehicle fitness Certificate, if applicable
* Fire Extinguisher
* First Aid Kit
* Seat Belts, Spare tyre, jack & tool kit, warning sign
* Any additional compliance as per applicable laws, be it specified herein or not.

# Management Information System (MIS) :

The service provider (SP) is responsible for maintaining and regularly releasing MIS reports. The provided list is indicative and not exhaustive. The SP is expected to generate a variety of reports, including but not limited to the following:

* Required information for RCA preparation will be provided by SP.
* SP will track, maintain, and report faults codes of DGs sets for critical faults of automation failure.
* Weekly/monthly review/governance meeting will be conducted to review following parameters, at SHQ / NHQ
* Energy KPIs
* PM / CM Dashboards.
* NWA (ENB, gNodeB, CSS, MW, UBR, P&U, Fiber Core, Collector etc.)
* Compliances on SAS, HSE, Fire, Statutory & Regulatory etc.
* Quality Dashboard
* EB Payment dashboard
* DG Automation failure Fault code
* HSEF Incidence Dashboard
* Compliance on JPW mobile application
* Fiber Faults
* MTTR
* Automation Tools compliance
* Available Resources like Manpower, Vehicles
* Material Consumption status
* Material Availability status
* Any incident / problem specific data, as and when required.
* SCRUM updation and churn
* Legal / Incident Report actions & pendency
* Network performance improvement plans for OFC, Electronic Equipment & Utilities – information & execution.
* Deployed Manpower & FRTs/TRTs etc. on daily basis

# ROW (Right of Way) Management:

Coordination for getting ROW as required from time to time at various levels for OFC repair / modification work for Intercity and Intracity/FTTx OFC network. All payments for ROW and related activity will be in RJIL scope, however SP will carry out the coordination activities as may be instructed EIC (Engineer In charge). SP to have strong liasioning capability in his work area to take care of management of issues occurring on daily basis during fault restorations; such that the SP will be able to manage on their own all day to day issues (spot management at fault location) with Municipal Corporation, Local Corporators, Electricity Boards, NHAI authorities, PWD Authorities, Railways, Water and Gas pipeline agencies and other agencies working on Jio fiber routes. No relaxation on this account will be granted from SLA/KPI deliverables.

# Co-ordination:

SP will coordinate and supervise Mechanical, Electrical, Civil (MEC), structural Maintenance & FMS / BMS; painting, waterproofing jobs at sites/facilities executed by other parties.

Liasoning with statutory authorities for the sites having DG, if required.

# Training:

Identifying training needs as required to meet the RJIL defined competency level requirements of OFC, Electronics (4G & 5G) and Utility equipment maintenance (including ERP–MM and PM modules), preparing training calendar, getting approved by EIC and imparting the training are in SP’s scope. Trained technicians from NTTF preferred. For Li-ion batteries and connected SMPS, RJIL will train the trainers. RJIL will provide necessary application access to SP.

# Spares Management:

SP’s scope for different categories of spares is as follows:

* FIM Spares/Consumables in RJIL Scope:

RJIL will supply the material and consumables for FIM Spares. The SP's responsibility includes the efficient storage and logistics management of these provided materials.

* Spares/Consumables in OEM Scope:

Coordination for spares and consumables within the Original Equipment Manufacturer's (OEM) scope is under the SP's purview. This involves effective communication and collaboration with the OEM to ensure seamless operations.

* Electronics and P&U Spares/Consumables in RJIL Scope:

RJIL will supply the Electronics and Power & Utilities (P&U) spares and consumables. The SP's role encompasses the logistics management of these materials, ensuring efficient handling and transportation.

* FIM Spares, Consumable Healthy Material Receipt, Storage, Reconciliation, Faulty Material Return, and Quarterly Reports:

The SP is entrusted with comprehensive management tasks related to Free Issue Material (FIM), encompassing the receipt, storage, reconciliation, and organized return of faulty materials. Additionally, the SP will compile and submit quarterly reports to provide updates on the status of spares and consumables within this scope.

# Packaging:

* For electronic cards appropriate packing of the return material to be done by SP preferably using the original packing as received against new card.
* For P&U spares, including controller cards, rectifier modules etc. carton box with bubble wrap to be used to make it transport worthy.
* Packing to be done by SP and packing material will be provided by RJIL.

# HSEF (Health Safety Environment Fire) :

The Service Provider (SP) is mandated to ensure the comprehensive implementation of Health, Safety, Environment, and Fire (HSEF) protocols. This includes ensuring that the field force is fully equipped with appropriate Safety gears and Personal Protective Equipment (PPEs) to guarantee a secure and protected working environment. For detailed guidelines please refer Annexure X.

# Damages/ Asset damages:

SP will be fully responsible for any damages, injury caused to any other third-party property / Persons during fault restorations. In case third party raises any demand note on RJIL/ Company, equivalent amount will be deducted from respective SP and demand note will be settled accordingly at the sole discretion of Company / RJIL as applicable. In case SP repairs the damages made by him to the satisfaction of such third parties; then no separate penalty will be levied on SP, provided SP submit NOC from the third party in a format approved by EIC. Similarly, any tool / TMI provided by RJIL if lost /physically damaged by SP manpower, amount will be recovered from SP.

SP to ensure quality compliance of all the PM activities. Any quality deviation leading to equipment burn, damage, Beyond Economic repair (BER) of any electronics, cards, modules Subsequently declared by repair agency/OEM, the cost of such damages will be recovered from SP.

# Asset and Inventory Management

**Movement of equipment:**

Inter site Movement of equipment/sub assembly/cannibalization, is not permitted. Any such deviation to above will be with prior written approval from CTO/Sectional head at NHQ. All asset changes will be updated in system (NE / GIS) thru RJIL state Planning Coordinator by SP.

**Sign-off of assets:**

During handover and takeover, assets are to be signed off for healthiness and quantity installed. Data is to be updated time to time for the same. Assets are to be handed over in the same good condition as was taken over. All ISP/OSP assets details (including Qty, Make, Model, Serial No.) to be captured during PM & details to be shared in excel format on quarterly basis including MP level sign off.

**RMA Process:**

Any faulty equipment is to be sent to maintenance point within 48 hours and record/document to be maintained for the same. After return in good condition, is to be installed at same site. History card is to be maintained for all equipment at the sites.

# Annexure – I: (A) Field Equipment

|  |  |  |
| --- | --- | --- |
| **Sr. No** | **Product** | **Components** |
| 1 | ENodeB | Baseband Unit (BBU), with UAMA, L9CA, LMD1, LCC2 cards |
| Remote Radio Unit (RRU) |
| Antenna |
| Accessories (eCIPRI, Jumber, Power, AISG, RET cables, GPS, SPD, etc.) |
| 2 | gNodeB | Centralised Distribution Unit (CDU) |
| Remote Radio Unit (RRU) |
| Antenna |
| Accessories (CIPRI, Jumber cables, Power cables, GPS, SPD, etc.) |
| 3 | Microwave | Parabolic Antenna, Microwave Radio |
| Accessories (RF& Power cables, etc.) |
| 4 | Unlicensed Band Radio (UBR) | Standalone / Splatted Radio Unit |
| Accessories (RF& Power cables, etc.) |
| 5 | Fiber Termination equipment | Optical Line Terminal (OLT) |
| WiFi (Aps Switches) |
| Radio Access Network |
| Transport |
| FDPs & Fiber Cables |
| 6 | Access Network | Routers |
| Switches , Wi-Fi access points |
| Patch Cords |
| 7 | Security & Automation Systems | Cameras |
| Other site security related items |
| 8 | Fire Alarm System | Sensors & Detectors |
| Fire Alarm Control Panel (FACP) |
| 9 | Utility Equipment | SMPS |
| UPS |
| PAC |
| Diesel Generator |
| DCDB, MCB, Electrical Panels |
| 10 | Infrastructure | Tower, Pole, Outdoor Cabinet (ODC) |

**Types of Towers & Facilities**

The type of Tower and Facilities are given below which is for indicative purpose and may not restrict only these and may increase/decrease as per the requirements.

|  |  |
| --- | --- |
| **Sr No.** | **Type of Sites** |
| 1 | AG1 (NLD) |
| 2 | AG2 (NLD / Metro) |
| 3 | AG3, SAG2, AG2 +OTN, MCN |
| 4 | ILA/IS |
| 5 | eNodeB / gNodeB (GBM/ GBT/RTT/RTP) |
| 6 | OLT |
| 7 | IP Colo |
| 8 | Outdoor (Small Cell/ Wi-Fi) |
| 9 | IBS |
| 10 | MW Repeater |
| 11 | UBR Repeater |
| 12 | Transmission |
| 13 | Any other Telecom Termination Point |

**Types of Fiber**

The following types of fiber are provided below for indicative purposes and may not be limiting. The selection may vary and can be adjusted based on the specific requirements.

|  |  |  |
| --- | --- | --- |
| **Sr. No** | **Fiber Link** | **Fiber Types** |
| 1 | Intercity (NLD) | 48F G652D / G655 of loose Tube |
| 2 | Intracity INC | 288F/96F of Ribbon Multi Tube & 48F G652 of loose Tube |
| 3 | FTTx | 96F/48F/ 24F/ 12F/ 6F of loose Tube, Figure 8, Figure 8 drop |

# Annexure – II: SLA & KPI for OFC Operation & Maintenance

SLA & KPI for OFC Operation & Maintenance Activity for Intercity and Intracity:

1. **KPI for Preventive Maintenance (PM):**

Below details are for the PM activity to be carried out on Intercity, Intracity, using Jio Patroller App & SAP work orders. Route Surveillance shall be done for 100% routes as per details given by RJIL.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr. No** | **Preventive Maintenance (PM)** | | | | **% Weightage** |
| 1 | Route Surveillance Compliance | Amount Equal to % of Pass WOs | 1 | Each Assigned Span Shall be travelled at least Twice in a Month using two-wheeler. Mobile app is provided for monitoring & tracking of the route. | 20% of PM value |
| 2 | In Case no Travelling against the assigned scope as per the SLA, Penalty @ Rs 10/Km will be applicable |
| 2 | 100% Dark Fiber Availability through mTest = OK (No Cut, No High loss) | Amount Equal to % of Pass WOs | 1 | SLA = WO Released must be closed within same Calendar Month | 80% of PM value |
| 2 | WO Tested & Found OK = 100% Payment for that WO |
| 3 | WO Tested & Found Not OK for 2 Consecutive Month = No Payment for Span/Link KM falling in the criterion. |
| 4 | WO Not Tested in the current month = No Payment for the Span/Link Km |
| 5 | For Calculation PM data of Billing Month & previous one month only |
| 3 | WO Released against **RFMS enabled Span (Closure < = 30** Days) | Amount Equal to % of Rectification WOs within SLA |  | No. of WO Rectified & Closed will be only payable |

1. **KPI for Corrective Maintenance (CM):**

The Score for each SLA shall be computed as under:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **KPI** | **Intercity** | | **Intracity** | |
| **SLA** | **Score** | **SLA** | **Score** |
|  | **Total Mark** |  | **100** |  | **100** |
|  | **Corrective Maintenance** | **-** | **100** | **-** | **100** |
| 1 | FTKM (Fiber, Patch cord Fault Combined) | < 4 | 15 | < 4 | 15 |
| ≥ 4 < 6 | 10 | ≥ 4 < 6 | 10 |
| ≥ 6 < 8 | 5 | ≥ 6 < 8 | 5 |
| ≥ 8 | 0 | ≥ 8 | 0 |
| 2 | MTTR, Hrs. (Fiber & Patch cord Fault) | < 4 | 15 | < 4 | 15 |
| ≥ 4 < 6 | 10 | ≥ 4 < 6 | 10 |
| ≥ 6 < 8 | 5 | ≥ 6 < 8 | 5 |
| ≥ 8 | 0 | ≥ 8 | 0 |
| 3 | TTR (Time to Repair) Compliance | >90% | 15 | >90% | 15 |
| >80% - 90% | 10 | >80% - 90% | 10 |
| >50% - 80% | 5 | >50% - 80% | 5 |
| < = 50% | 0 | < = 50% | 0 |
| 4 | Temp Fault Generation During the Month | < 2% | 15 | < 2% | 15 |
| > 2 - < 5% | 10 | > 2 - < 5% | 10 |
| > 5 - < 10% | 5 | > 5 - < 10% | 5 |
| > 10 | 0 | > 10 | 0 |
| 5 | Temp to Permanent Restoration Compliance (Generated with in the month & closed within 7 Days from TT Clear Date) Including dark fiber restoration & regular PM activity. | > 95% | 10 | > 95% | 15 |
| 80% - < 95% | 5 | 80% - < 95% | 10 |
| < 80% | 0 | < 80% | 0 |
| 6 | GIS Update (Post Fault Repair/Changes due to rerouting) **(≤ 1 Days) Applicable to All Fault (During CM Temp/Permanent Both)** | > 95% | 10 | > 95% | 10 |
| 90% - < 95% | 5 | 90% - < 95% | 5 |
| < 90% | 0 | < 90% | 0 |
| 7 | High loss Aging (Intercity + Intracity) | ≤ 7 Days | 10 | ≤ 7 Days | 15 |
| 8 - 15 Days | 5 | 8 - 15 Days | 10 |
| > 15 Days | 0 | > 15 Days | 0 |
| 8 | Patrolling Compliance  Patrolling on Each span shall be >80% of Assigned Span Scope on patrolling day | > 98% | 5 |  |  |
| 95% - < 98% | 3 |  |  |
| < 95% | 0 |  |  |
| 9 | Patrolling Compliance  Comp. of Travelled Km on Span Vs Assigned Scope | > 98% | 5 |  |  |
| 95% - < 98% | 3 |  |  |
| < 95% | 0 |  |  |

|  |  |
| --- | --- |
| 1 | **Material Penalty: -** Applicable above 8 FTKM on Actual at MP Level (Separate for Inter & Intra).  This is applicable over & above the Penalty Capping. Based on ground conditions CTO can waive off the material penalty. |
| 2 | **PM WO** |
| a | PM WOs for Core/Collector/Metro core will be done progressively via Route Fiber Monitoring System (RFMS). In case of Faults, WO will be released & same has to closed < = 15 Days. |
| b | PM WOs for non-RFMS enabled span/links will be released on monthly basis & required to be closed within that calendar month |
| 3 | **Resource Requirement against > 180 days expansion clause** |
| a | Organization Intend to have FTKM <= 4.0, Whatever additional manpower is required to achieve this will be deployed by SP |
| b | SP has to provide manpower commitment in advance for the resources to be deployed on  ground (Supervisor, Splicer, Asst. Splicer, Patroller & Route Guards) |
| c | Resources Over & Above the agreed quarterly / monthly Commitment, will be provided by Jio, Post CTO Approval |

**Part B1: Penalty (For Part A Scoring)**

|  |  |
| --- | --- |
| **Fiber** | |
| **Score** | **Penalty** |
| ≥85 to < 90 | 2.00% |
| ≥80 to <85 | 3.00% |
| ≥75 to <80 | 4.00% |
| ≥70 to <75 | 5.00% |
| ≥65 to <70 | 6.00% |
| < 65 \* | 7.50% |

\* Warning Letter to be issued for SPs going lower than 65. Multiple Warning Letters may lead to Contract termination.

**Part B2: Reward (based on FTKM)**

|  |  |
| --- | --- |
| **Intracity FTKM** | **Reward** |
| ≥ 3.0 – < 4.0 | 5.00% |
| ≥ 2.0 – < 3.0 | 7.00% |
| < 2.0 | 10.00% |
| **Intercity FTKM** | **Reward** |
| ≥ 2.0 – < 4.0 | 5.00% |
| > 0 – < 2.0 | 7.00% |
| 0 | 10.00% |

All Measurements are to be made Maintenance Point (MP) level.

**Part C: Other Penalty Factors**

1. **Material Debit:** If SP is unable to keep the number of Fiber faults within the SLA and the number of faults (FTKM) goes above the targeted SLA, then 50% value of the FIM shall be deducted to SP. This will be over & above penalty cap of 10 %. Based on ground conditions CTO can waive off the material debit.
2. **Flapping:** Rs 500 per incident for Core Links & Rs 100 per incident for Collector Links. Flapping incidents shall be as per NOC report.
3. **Patch Cord**: Patch Cord Fault at Fiber end (other than Transport / SFP Failure) will be considered as Fiber Cuts / Faults and as such will get added to FTKM and MTTR.
4. **Human Error:** Any activity without taking PE/information to RJIL Rs. 25,000/- per incidence**.**

* State wise Fiber Improvement plan will be shared separately (Half Yearly basis).
* Penalty/Reward and KPI Payments:
* Payments shall be made based on system generated scope (quantity) and KPI/SLA.
* Payments will be made on a monthly basis and will be a percentage of the monthly charges for that particular month. This would be based on the penalty / reward table stated below. Every performance parameter is given a Score as per compliance achieved.

1. **SLA / KPI – FTTX**

**Fiber - Feeder and Distribution**

* + 1. SP Payment is proposed in two ways, against CM & PM
    2. SP to only Invoice for PM where Work order executed (WOCL).

**KPI for Corrective Maintenance (CM) for FTTx network**

|  |  |  |  |
| --- | --- | --- | --- |
| **S. No.** | **KPI** | **Intracity**  **SLA Score** | |
|  | **Total Mark** |  | **100** |
| 1 | FTKM (Fiber, Patch cord Fault Combined) | < 4 | 15 |
| ≥ 4 < 6 | 10 |
| ≥ 6 < 8 | 5 |
| ≥ 8 | 0 |
| 2 | MTTR, Hrs (Fiber & Patch cord Fault) | < 4 | 15 |
| ≥ 4 < 6 | 10 |
| ≥ 6 < 8 | 5 |
| ≥ 8 | 0 |
| 3 | TTR Compliance | >90% | 15 |
| >80% - 90% | 10 |
| >50% - 80% | 5 |
| < = 50% | 0 |
| 4 | Temp Fault Generation During the Month | < 2% | 10 |
| > 2 - < 5% | 8 |
| > 5 - < 10% | 5 |
| > 10 | 0 |
| 5 | Temp to Permanent Restoration Compliance (Generated with in the month & closed within 7 Days from TT Clear Date) | > 95% | 10 |
| 80% - < 95% | 5 |
| < 80% | 0 |
| 6 | GIS Update (Post Fault Repair/Changes due to rerouting) **(≤ 1 Days) Applicable to All Fault (During CM Temp/Permanent Both)** | > 95% | 10 |
| 90% - < 95% | 5 |
| < 90% | 0 |
| 7 | FTTx F&D Availability | > 99.990% | 25 |
| 99.99% - 99.985% | 20 |
| 99.985% - 99.980% | 15 |
| 99.980% to 99.970% | 10 |
| <99.970% | 0 |

1. **Preventive maintenance Weightage**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr No** | **KPI** | **Frequency** | **Weightage with Route surveillance** | **Weightage without Route surveillance** |
| 1 | FAT/S1/S2/JC PM in periodic frequency | 100 % In 6 Months | 30% | 40% |
| 2 | F&D cable PM (Including Sag removal and cable redressing) | Quarterly | 30% | 40% |
| 3 | S2 High Loss Closure | Incident Based- CM TT | 15% | 20% |
| 4 | Route Surveillance for F&D cables | Daily | 25% | 0% |

No Payout for the FSA/Fiber KMs Cumulative OPEN WOs for the Month.

SP will be eligible for billing for complete FTTx scope less WO not executed on monthly basis.

1. **Other Details F&D**

|  |  |
| --- | --- |
| **1** | **Material Penalty: -**Applicable above 8 FTKM on Actual at MP Level (Separate for Inter & Intra). This is applicable over & above the Penalty Capping. Based on ground conditions CTO can waive off the material penalty. |
| **2** | **PM WO** |
| i | * PM will be released FSA wise. * If CMP having “X” number of FSA * No. of FSAs for Six Monthly PM: X/6 * No. of FSAs for Quarterly Monthly PM: X/3 * PM WO will be done only after 100% completion of all activities in FSA. |
| ii | * PM Payment of CMP will be based on %age completion of assigned WOs. * Work Orders assigned for a particular month shall be completed in that month only. * In case there is any pending WO for the month, same will be carried forward for the next month and added to the total scope of the next month. Payments shall be calculated basis percentage completion of Total scope i.e. (BTG WOs of previous month + New WOs for the month) |
|  | **Resource Requirement against > 180 days expansion clause** |
| i | Org Intend to have FTKM <= 4.0, Whatever additional manpower is required to achieve this will be deployed by SP |
| ii | SP has to provide manpower commitment in advance for the resources to be deployed on ground. (Supervisor, Splicer, Asst. Splicer, Patroller & Route Guards) |
| iii | Resources Over & Above the agreed Quarterly / monthly Commitment, will be provided by Jio, Post CTO Approval |

Note: All Measurements are to be made CMP level.

1. **The Performance measurement shall be as under:**

\* Warning Letter to be issued for SPs going lower than 80. Multiple Warning Letters may lead to Contract termination.

**Part B1: Penalty (For Part A Scoring)**

|  |  |
| --- | --- |
| **Fibre F&D** | |
| **Score** | **Penalty** |
| ≥85 to < 90 | 2.00% |
| ≥80 to <85 | 3.00% |
| ≥75 to <80 | 4.00% |
| ≥70 to <75 | 5.00% |
| ≥65 to <70 | 6.00% |
| < 65 \* | 7.50% |

**Part B2: Reward (based on FTKM)**

|  |  |
| --- | --- |
| **Intracity FTKM** | **Reward** |
| ≥ 3.0 – < 4.0 | 5.00% |
| ≥ 2.0 – < 3.0 | 7.00% |
| < 2.0 | 10.00% |

All Measurements are to be made MP level.

**Imp Note:** In case of Core Domain KPIs, it is likely that at some performance levels, Rewards & Penalties, both, will be applicable. In such cases, both shall be computed. Net effect after computations at Circle level shall be paid / deducted, as the case may be.

**SLA / KPI – FTTX OLT**

The Score for each SLA shall be computed as under:

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **KPI** | **SLA** | **Score** |
| 1 | OLT Availability | >99.99 | 70 |
| >99.95- 99.99 | 60 |
| >99.90- 99.95 | 50 |
| >99.50-99.90 | 40 |
| ≤ 99.50 | 30 |
| 2 | Preventive Maintenance Compliance (TT02 orders within TAT defined by Jio) in accordance with all SAP processes | 100% | 30 |
| ≥ 90% - < 100% | 20 |
| ≥ 80% - < 90% | 10 |
| < 80% | 0 |
| 3 | Fatality – Incidents | 0 | 0 |
| 1 | -20 |
| 2 | -40 |

**Measurement at Circle level.**

The Performance measurement shall be as under:

|  |  |
| --- | --- |
| **Score** | **Penalty** |
| 90 | 2.5% |
| 80 | 5% |
| < 80 \* | 7.5% |

\* - Warning Letter to be issued for SPs going lower than 80. Multiple Warning Letters may lead to Contract termination.

|  |  |
| --- | --- |
| **OLT Availability** | **Reward** |
| >99.990 - 99.995 | 5.00% |
| >99.995 - <99.999 | 7.00% |
| 99.999 – 100 | 10.00% |

Remark: Measurement at Circle level.

**Imp Note:** In case of Core Domain KPIs, it is likely that at some performance levels, Rewards & Penalties, both, will be applicable. In such cases, both shall be computed. Net effect after computations at Circle level shall be paid / deducted, as the case may be.

1. **QUALITY PARAMETERS:**

|  |  |  |
| --- | --- | --- |
| **Sr. No** | **Description** | **SLA** |
| 1 | Permanent restoration of temporary restored fault | ≤ 7 days (≤ 15 days for HDD cases) |
| 2 | Route surveillance | As per plan |
| 3 | Fiber Loss | 100% of the Intercity/Intracity Fiber should have loss ≤ 0.30 dB/km |
| 4 | Periodic Dark Fiber measurement | As per RJIL Prescribed Norms |

**Note:**

For HDD/ Micro-trenching, MTTR is for temporary restoration-splicing all fibers / Ribbons.

1. **EXCLUSIONS LIST FOR MEASUREMENT & CALCULATIONS :**

Upon occurrence of one or more of the following events, the KPI measurements of the affected area

shall continue to be performed as normal. SP and RJIL shall mutually agree on the extent of the

exclusion prior to or after the occurrence of the exclusion(s) stated below and the corresponding effect

it shall have on network performance calculations.

* Force majeure, Natural calamities which are beyond the control of SP
* Reasonable Planned downtime for maintenance
* This exclusion list shall be reviewed and modified as needed every 6 months, if required.

1. **PROCESSES :**

The following processes shall be jointly agreed between RJIL and SP for implementation:

* Performance reporting mechanism – List and frequency of the (MIS) reports to be frozen
* Daily Network Outage report (along with reasoning) sign off process
* Planned Downtime

1. **Sign of Processes :**

KPIs after applying exclusions shall be signed off at the state level on a monthly basis by SP on the basis

of NOC report. NOC report shall be considered as final and binding to SP.

|  |  |  |
| --- | --- | --- |
| **Activity** | **Responsible** | **Timeline** |
| Submission of monthly KPI without exclusions  for the month | NHQ SME | 5th day of following month |
| Submission of exclusions jointly signed off | SP & CMM | 10th day of following month |
| Approval of monthly KPIs with exclusions for  the month | CMM & CTO | 15th day of following month |
| JMS Sign Off | SP | 20th of Following Month |
| Submission of Invoice | SP | 25th Of the Following Month |

**Note:**

**KPI shall be monitored on monthly basis i.e. Averaged out on monthly basis for working out the performance of SP. Measurement shall be at MP level and Invoicing will be done on State level.**

**Requirements Tower Requirements:**

**NOTE:**

**• Failure to carry out the above parameters will lead to issue of warning letter, on a consolidated basis, viewed end of the month.**

**• Issue of 4 warning letters may lead to termination of Contract**

**Basic Hygiene Parameters – Essential**

|  |  |
| --- | --- |
| **S.No** | Parameters |
| **1** | Site Cleanliness (No vegetation beyond seasonal  permissible levels) |
| **2** | Safety Compliance |
| **2.1** | Fatality (Zero) |
| **2.2** | Fire Incidents attributable to SP (Zero) |
| **3** | Zabbix Connectivity of Utility Equipment’s (100 %) |
| **3.1** | SMPS Connectivity, Reachability & Correct Parameter |
| **3.2** | Earthing/Grounding Connectivity & Value of same  should be <3 Ohms |
| **4** | WO Closure (100 %) |
|  |  |

**Fiber Requirements:**

|  |  |
| --- | --- |
| **S.No** | **Parameters** |
| 1 | Permanent Restoration (100 %) |
| 2 | Core Cut (Zero) |
| 3 | High Loss removal (No high loss permitted) |
| 4 | WO Closure (100 %) |

NOTE:

1. **Failure to carry out the above parameters will lead to issue of warning letter, on a consolidated basis, viewed end of the month.**
2. **Issue of 4 warning letters may lead to termination of Contract**
3. **General Rewards and Penalties:**

General Penalties and Rewards for the reasons attributable to SP are as under:

|  |  |  |
| --- | --- | --- |
| **Sr. No.** | **Activity** | **Penalty** |
| 1 | Theft cases | Replacement Price of Equipment + 25% or Rs. 1,00,000/- per site (Whichever is less) |
| 2 | Equipment Damaged cases (including Transportation damage due to improper packing of return material) | Replacement Price of Equipment + 25% (to the extent of repair for damage cases and replacement for BER cases) or Rs. 5,00,000/- per site (whicheveris less) |
| 3 | Fire incidents at site | a) The cost of burnt equipment and associated accessories, plus 25%, or Rs. 10,00,000/- whichever is less shall be deducted due to nonperformance from SP, after conclusion with RCA that fire is attributed to SP. b)Zero reward to SP in month of Incident in respective domain), if Fire is attributed due to poor workmanship in final RCA c) This recovery should be over & above Penalty capping cost limit |
| 5 | EB and Fuel Pilferage (Specific Fuel Consumption is fixed based on the DG capacity and load connected at each site. If any deviation >5% than the fixed CPH, then shall be liable for penalty) | 1.07 times the discrepancy value |
| 6 | Site outage due to lapse in fuel filling | Rs. 10,000/- per incidence |
| 7 | Delay in EB bill payment leading to late payment charges (fine) / disconnection | 2 times the Late Payment charges (fine) / Reconnection charges (penalty) |
| 8 | Lost Workday Case (LWC) at Site | a)  Noncompliance charges @₹ 10,000 / Incident will be levied  b)  Penalty must be over & above Penalty capping limit |
| 9 | Non-updatation of SP Employee records in VLMS for transfer / attrition/ unauthorized personnel | Rs. 1,000/- per incidence |
| 10 | Process Non-Compliance: **a.** TT01 (service affecting) work orders not closed within 24 Hours, through JPW,- DG Fuel/EB bill collection & entry not done/ within 48 hrs. of purchase or Incorrect entry done | Rs. 100/- per incidence |
| 11 | Non-Availability of all requisite Tools and Tackles | Rs. 1,000/- Per incidence |
| 12 | Non-usage of PPE by SP personnel | Rs. 5,000/ - Per incidence and Termination of the concerned SP personnel |
| 13 | Non-compliance of EMF signage during audit conducted at Site physically | a) Rs.5,000 per instance per Site |
| 14 | Non-compliance to faulty (repairable) material return timeline (between 261 and 262 movements) from site to MP. Non RSNR material is not to be considered towards this computation. This will not be applicable for delay due to reasons not attributable to SP. | b1) Rs. 5,000/- per instance per Site from 6th day onwards till 7th day or the cost of Equipment, whichever is less.   b2) Rs.10,000 per instance per Site from 8th day onwards for Equipment other than Li Ion Battery, or the cost of Equipment, whichever is less.  b3) Rs.20,000 per instance per Site from 8th day onwards till 10th day, in case of Li Ion Batteries.  b4) Cost of the Battery beyond 10 days. If Battery is later found not to be BER by OEM, debited cost, net of Rs.20,000, to be credited to SP. |
| 15 | Any delay beyond 7 days to integrate new sites in existing LIVE network, offered by RJIL Construction team, after obtaining approval for PE from RJIL NOC | Rs. 5,000 / day / site |
| 16 | Intentional Cuts by SP Personnel | Rs. 25,000 per cut & Rs 10,000 per affected Site |
| 17 | Site down due to Sabotage by SP Personnel– Small Facilities (ENB & MAG1) and dependent down sites | Rs. 25,000 (Take off / Hub ENB and MAG1) Site and Rs 10,000 per dependent Site |
| 18 | Site down due to Sabotage by SP Personnel – Medium Facilities (ILA & NAG1) and dependent down Sites | Rs. 50,000 per Medium Facility and Rs. 10,000 per dependent Site |
| 19 | Deficiencies noticed with respect to the quarterly plan submitted by the SP to EIC, for actual deployment in field of resources and infrastructure, in case SLAs are not being met. | The amount equivalent to the gap against committed numbers will be deducted for the corresponding period. e.g. In case, one Asst. Splicer is found short for one month, the amount of salary of Asst. Splicer will be deducted for one month |
| 20 | Site Vegetation & Beehive Removal so as to have clear access to Site & Tower, considering seasonal permissible levels | Rs. 500 per Site per month |
| 21 | In-scope Jobs carried out by Jio on behalf of the SP in view of work not being done. Multiple cases of this nature will lead to issue of warning letter / termination of contract. | 1.25 times of actual cost |
| 22 | Gap in minimum agreed TRT Count | Equivalent Site Count as per dimensioning will be removed from Billing Scope as per actuals. |
| 23 | Fatal Incident | a)  Zero reward to SP in month of Incident b)  SP to make adequate compensation to Deceased’s Spouse/Mother( If deceased is unmarried) in 7 days’ time c)  Flat Penalty @₹ 10 Lakhs / Incident d)  Penalty must be over & above Penalty capping limit |
| 24 | Tower Collapse /Pole Collapse cases | a) The cost of burnt equipment and associated accessories, plus 25%, or Rs. 10,00,000/- whichever is less shall be deducted due to non-performance from SP, after conclusion with RCA that fire is attributed to SP.  b) Zero reward to SP in month of Incident in respective domain), if Fire is attributed due to poor workmanship in final RCA  c) This recovery should be over & above Penalty capping cost limit |
| 25 | Other penalty of Fiber (over and above of penalty cap of 10%) | Material Penalty: If SP is unable to keep the number of Fiber faults within the SLA and the number of faults (FTKM) goes above the targeted SLA, then 50% value of the FIM shall be deducted to SP. This will be over & |
| above penalty cap of 10 % |
| Flapping: Rs 500 per incident for Core Links & Rs 100 per incident for Collector Links. Flapping incidents shall be as per NOC report |
| Patch Cord: Patch Cord Fault at Fiber end (other than Transport / SFP Failure) will be considered as Fiber Cuts / Faults and as such will get added to FTKM and MTTR. |
| Human Error: Any activity without taking PE/information to RJIL, will attract penalty of Rs. 25,000/- per incidence over and above of penalty cap of 10%. |

**Note:**

All the penalties as mentioned shall be applicable only for those instances / reasons that are attributed to the SP as per Root Cause Analysis.

Any claim settlement received from Insurance Company shall be credited to the SP against the earlier debit made, if any, net of deductible amount as per point no 1, 2 and 3 in above table.

**Overall Cap on Penalty:** Overall cap on all penalties put together (KPI-SLA based and General Penalties) will be **10%** of the total billing of the contract, for the month for the state.

The capping of the cost will not be applicable to Equipment loss (points # 1 & # 14.b4), high CPH (point # 5), PPE (point # 12) and Ins cope (point # 21), Non Compliance of PM for Tower, Fiber, ODSC and FTTX and Fiber material penalty

**Total score shall be calculated as per the SLA score table and payment shall be made based on penalty / reward as applicable as per performance measurement table.**

Percentage of penalty / reward mentioned above shall be the % of the monthly billing for the circle for that particular Network element.

# Annexure – III – O&M SLA & KPI for Tower Sites

### SLA / KPI – Small facilities (Tower/ENB Sites – Own (P1), IP Colo, gNB(5G NR) )

Minimum Resource Requirement:

* Telecom Equipment SME at SHQ and Supervisor at CMP Level.
* 3 Laptop per CMP for fault rectification.
  1. SP Payment is proposed in two parts.
     1. KPI based Score obtained from achieved SLA (State Wise KPI’s)
     2. Preventive Maintenance (Site Wise Billing)
  2. PM Compliance linked with the Quality & Performance**.**
* Preventive Maintenance is to be carried out against the RJIL SAP work order within 90 days.
* Monthly Site PM by Technician
* Fortnightly PM of Solar & GBM sites.
* Quarterly Site PM by Rigger

PM WOs to be considered for billing are, Monthly Site PM by Technician, fortnightly PM of Solar & GBM sites and Quarterly Site PM by Rigger. Quarterly Rigger PM to be considered only after 90 days period completion as per Annexure-IV

* + 1. No PM Work, No Payment. Sites TECOed (Technically Completed) as per PM Checklist shall qualify for invoicing except sites with ZERO Battery Module or ZERO Rectifier Module visibility in Zabbix.
    2. Sites failing in below 2 parameters shall be eligible for 50% invoicing for sites where Jio equipment is installed.
       1. SMPS Reachability in NOC and Zabbix visibility of DG, Battery Modules & Rectifier Modules for minimum 23 days in a month.
       2. Correct Energy Parameter (Mains Cumulative KWH, Load Cumulative KWH, DG KWH, EB KWH, Fuel Level) for minimum 23 days in a month.
    3. PM amount to be paid basis on the below criteria for qualified sites.

1. 50% Payout for the sites down more than 4 Times in a month as a main site due to Operational issue within SP control.

The Score for each SLA shall be computed as under:

| **Sr. No.** | **KPI** | **SLA** | **Score** |
| --- | --- | --- | --- |
| 1 | eNodeB & gNodeB Availability | ≥99.99% | 30 |
| ≥99.95% & <99.99% | 20 |
| ≥99.85% & <99.95% | 10 |
| <99.85% | 0 |
| 2 | Service affecting Alarms (eNodeB, gNodeB, MW & CSS, eBand, High Capacity-UBR) ≤4 hrs | 100% | 10 |
| ≥99.95% & <100% | 8 |
| ≥99.85% & <99.95% | 5 |
| <99.85% | 0 |
| 3 | Non Service affecting Alarms (eNodeB, gNodeB, MW & CSS, eBand, High Capacity-UBR ) ≤ 24 hrs | ≥99% | 10 |
| ≥85% & <99% | 5 |
| <85% | 0 |
| 4 | Infra Uptime | ≥99.999% | 20 |
| ≥99.95% & <99.999% | 10 |
| <99.95% | 0 |
| 5 | DG Failed to Start (Jio Own DG’s) | 100% | 15 |
| ≥95% & <100% | 10 |
| ≥90% & <95% | 5 |
| <90% | 0 |
| 6 | DU Up Cell Down >4 Hrs. eNodeB & gNodeB | 100% | 15 |
| > 99.990 & <100% | 10 |
| > 99.980 & <99.990% | 5 |
| < 99.980 | 0 |

All Measurements are to be made at CMP level.

**Note:** Exclusions to be given by CTO after due validation & explanation for Force Majeure (Natural Calamity, Curfew, local government/Authority Orders), Estate & Authority related issues (Supported by EMG) and RJIO dependency cases.

**The Performance measurement shall be as under:**

|  |  |
| --- | --- |
| **Proposed Rewards & Penalty** | |
| **NWA** | **Reward** |
| 100% | 10% |
| >=99.98% - <100% | 8% |
| >=99.97% - <99.98% | 7% |
| >99.95% - <99.97% | 5% |
| **Score** | **Penalty** |
| 95 | 2.0% |
| 90 | 3.0% |
| 85 | 5.0% |
| <=80 | 7.5% |

\* - Warning Letter to be issued for SPs going lower than 70. Multiple Warning Letters may lead to Contract termination.

|  |  |
| --- | --- |
| **Small Cell Availability** | **Reward** |
| >=99.98 - <99.99 | 5.00% |
| >=99.99 - <100% | 7.00% |
| =100% | 10.00% |

All Measurements are to be made CMP level.

**Note:** In case the eNodeB/gNB (5G NR) / IP Colo Partners or due to lease Fibre cuts (ie. fibre not maintained by SP), such cases will be excluded from the computations on authorization from the CTO.

State wise Tower and Outdoor Small cell Improvement plan for first six month is shared separately.

### SLA / KPI - Medium Facilities (MAG2, NAG2, ILA, NAG1)

* 1. SP Payment is proposed in two parts

1. KPI based Score obtained from achieved SLA
2. Preventive Maintenance
   1. PM Compliance linked with the Quality & Performance.
      1. Sites for which PM not done in one month is not eligible for billing.
      2. Sites with 100% TECO (Technically Completed) compliance for Small Facility and Medium Facility as per PM Checklist.
      3. Ensuring 100% compliance of below parameter for applicable sites where Jio equipment available.
3. Zabbix connectivity & Reachability of SMPS, Battery, DG & Rectifier Module during PM activity
4. Correct Energy Parameter (Mains Cumulative Run Hrs, Mains Cumulative KWH, Battery Cumulative Run Hrs, Battery Cumulative KWH, Load Cumulative KWH, DG Run Hrs, DG KWH, EB KWH, Fuel Level).
   * 1. PM amount to be paid basis on the below criteria for qualified sites.
5. 100% payout for the sites down once in a month as a main site due to Operational issues within SP control.
6. 75% payout for the sites down 2-4 times in a month as a main site due to Operational issue within SP control.
7. 50% Payout for the sites down more than 4 Times in a month as a main site due to Operational issue within SP control.

The Score for each SLA shall be computed as under:

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **KPI** | **SLA** | **Score** |
| **1** | AG2, JCN-AG2,ILA,NLDAG1, Availability | 100% - 99.999% | 40 |
| < 99.999% - ≥ 99.95% | 30 |
| 99.85% - <99.95% | 20 |
| <99.85% | 0 |
| **2** | Site Cleanliness & hygiene maintained | 100% | 20 |
| <100% | 0 |
| **3** | Correct Energy Parameter in Zabbix | 100% | 40 |
| <100% - >=99% | 20 |
| <99% - >=95% | 10 |
| <95% | 0 |

All Measurements are to be made Facility level.

**The Performance measurement shall be as under:**

|  |  |
| --- | --- |
| **Score** | **Penalty** |
| <99.5 | 2% |
| ≤99 | 3% |
| ≤95 | 4% |
| ≤90 | 5% |
| ≤85 | 6% |
| ≤80\* | 7.5% |

\* - Warning Letter to be issued for SPs going lower than 60. Multiple Warning Letters may lead to Contract termination.

|  |  |
| --- | --- |
| **Power Availability** | **Reward** |
| 100 | 5.00% |

All Measurements are to be made MP level.

State wise MFL Improvement plan for first six month is shared separately.

### SLA / KPI – Small Cell (Outdoor) & Enhanced Small Cell (ESC)

1. SP Payment is proposed in two parts.
2. Preventive Maintenance (Site Wise Billing)
3. KPI based Score obtained from achieved SLA.
4. PM Compliance linked with the Quality & Performance.
5. Sites for which PM not done is not eligible for billing.
6. Sites with 100% TECO compliance as per PM Checklist and Zero Critical Alarms.
7. Ensuring 100% compliance of below parameter.
   * + 1. SMPS reachability.
       2. UBR takeoff site on critical load (as per Photographical evidence in PM checklist)
       3. No surge arrestor bypass cases for UBR
       4. Ensure No Manual crimped cables used for UBR (Zero <=10 Mbps throughput cases)
       5. Zero Received Signal Level (RSL) UBR cases due to antenna misalignment.
       6. Ensure SMPS, Rectifier, Controller, Battery module, Inverter are in operational condition.
       7. Alarm re-simulations (Mains fail, Rectifier fail, Invertor fail, Fuse fail)

The Score for each SLA shall be computed as under:

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **KPI** | **SLA** | **Score** |
| 1 | Small cell / Wi-Fi / ESC / UBR Availability | > 99.95 | 40 |
| 99.95 | 35 |
| 99.86 - 99.94 | 30 |
| 99.75 - 99.85 | 20 |
| < 99.75 | 0 |
| 2 | Service affecting Alarms  (Small Cell / Wi-Fi / ESC) ≤4 hrs | 100% | 30 |
| ≥ 95% - < 100% | 25 |
| ≥ 90% - < 95% | 20 |
| ≥ 85% - < 90% | 15 |
| ≥ 80% - < 85% | 10 |
| < 80% | 0 |
| 3 | UBR RSL Degraded cases <=24 hrs(Criteria: <-57 dB level) | 0 | 7.5 |
| >=1 | 0 |
| 4 | SMPS unreachable cases <=4 hrs | 0 | 15 |
| 5 | 10 |
| 10 | 5 |
| >10 | 0 |
| 5 | UBR port negotiation speed <=24 hrs (Criteria: =10 Mbps) | 0 | 7.5 |
| >=1 | 0 |

**Note:** All Measurements are to be made at CMP level

**Note:** Exclusions to be given by CTO after due validation & explanation for Force Majeure (Natural Calamity, Curfew, local government/Authority Orders), Estate & Authority related issues (Supported by EMG) and RJIO dependency cases

**The Performance measurement shall be as under:**

|  |  |
| --- | --- |
| **Score** | **Penalty** |
| >95 | 0% |
| <=95 | 2% |
| <=90 | 3% |
| <=85 | 5% |
| <=80 | 7.5% |

\*- Warning Letter to be issued for SPs going lower than 70. Multiple Warning Letters may lead to Contract termination.

|  |  |
| --- | --- |
| **Small Cell Availability** | **Reward** |
| >=99.98 - <99.99 | 5.00% |
| >=99.99 - <100% | 7.00% |
| =100% | 10.00% |

The following waivers shall be given only in case of Small Cell and Wi - Fi, wherever applicable, by the Chief Maintenance Manager /CTO after validation:

* 1. **Owner Agreement and Rent Issue**: Node switch off due to Customer Agreement or Rent payment issue.
  2. **Operation Hour:** Node Power switch off by customer after closure hours of Shop/Mall/Colleges/Offices.
  3. **Vacation**: Nodes Power Switch off due to vacation in colleges and access not allowed due to security or other reasons.
  4. **By design Battery Bank not available**: Wherever space for Utility Box is not provided or not available. Nodes are connected directly to raw power.
  5. **Renovation**: Building under renovation leading to removal or dismantling of Node to avoid any damage.
  6. **Business issue like Unlimited Data, Lease Line**: Customer / Owner demands such as unlimited data, lease line etc. not fulfilled leading to Nodes Power switch off.
  7. **Event Based Cells / Nodes**: Node are deployed for specific events such as a Cricket match in a Stadium and after event finished, Node are Power switched off.
  8. **EB payment:** Non- payment of EB Bill by Owner / Customer / Jio impacting power availability to Nodes.
  9. Cuts in Fiber N/W not maintained by SP.

**Note:**

**KPI shall be monitored on monthly basis ie. Averaged out on monthly basis for working out the performance of SP. Measurement shall be at Circle level.**

**SLA / KPI – Small facilities (Tower/ENB Sites – Own, RP1, IP Colo, gNB(5G NR))**

**I.** SP Payment is proposed in two parts.

i. KPI based Score obtained from achieved SLA (CMP Wise KPI’s)

ii. Preventive Maintenance (Site Wise Billing)

II. PM Compliance linked with the Quality & Performance.

PM WOs to be considered for billing are, Monthly Site PM by Technician, fortnightly PM of Solar & GBM sites and Quarterly Site PM by Rigger. Quarterly Rigger PM to be considered only after 90 days period completion.

a. No PM Work, No Payment. Sites TECOed as per PM Checklist shall qualify for invoicing except sites with ZERO Battery Module or ZERO Rectifier Module visibility in Zabbix.

b. Sites failing in below 2 parameters shall be eligible for 50% invoicing for sites where Jio equipment is installed.

i. SMPS Reachability in NOC and Zabbix visibility of DG, Battery Modules & Rectifier Modules for minimum 23 days in a month.

ii. Correct Energy Parameter (Mains Cumulative KWH, Load Cumulative KWH, DG KWH, EB KWH, Fuel Level) for minimum 23 days in a month.

c. PM amount to be paid basis on the below criteria for qualified sites.

i. 50% Payout for the sites down more than 4 Times in a month as a main site due to Operational issue within SP control. Sites where PM is not completed for three consecutive months, will have 3 times deduction of PM amount from the State invoicing.

1. SAP Access required for TT01 WO Tracking:

SPs are enabled to get the hourly dump of WOs from system directly. SPOCs (1 per CMP & 1 per SHQ) are getting the dump of WOs on hourly basis.

2. Certification of JMS for CMPs will be done finally at CMP/SHQ level.

3. TECO is Mandatory for Quality PM. CMM to validate and provide the exclusion against Non TECO WOs for invoicing, rest parameter will remain same.

4. All Tower WOs are getting created latest by the last date of previous month. Same will be released to Technician/Rigger by 1st of the current month.

# Annexure – IV - Activities / Tasks to be Performed.

This section covers the list of activities which can be performed on various types of equipment.

Following are legends for tables covering the list activities in this section.

Legend:

D Daily,

W Weekly,

F Fortnightly

M Monthly

Q Quarterly

H Half Yearly

Y Yearly

1. **Activities for FTTX**

| **FTTX** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Activities / Tasks to be Performed | D | W | F | M | Q | H | Y | Remark |
| FTTX\* | HOTO of ODN Network | Yes |  |  |  |  |  |  |  |
| RFS validation for ODN Network |  |  | Yes |  |  |  |  |  |
| Resolution of customer issues/support for  customer activation | Yes |  |  |  |  |  |  |  |
| Liaison with Building owner etc. for feeder and distribution cable maintenance. | Yes |  |  |  |  |  |  |  |
| ODN maintenance |  |  |  | Yes |  |  |  |  |
| Feeder/distribution cable  maintenance/shifting/relocation. |  |  |  |  | Yes |  |  | < 4 Hr Need basis |
| MH/HH shifting, uplifting |  | Yes |  |  |  |  |  | As and when needed |
| Change of port/cable/route for fast  restoration during OFC Cut | Yes |  |  |  |  |  |  | <1 Hr need basis |
| Dark (Unused) Fiber Testing (OTDR/LSPM) |  |  |  |  | Yes |  |  |  |
| As built updation | Yes |  |  |  |  |  |  | As and when needed |
| Break-down maintenance of FTTx/OLT/Hex  ODC | \*\* | | | | | | | As and when needed |
| OLT | Inspect for all Cable Proper Routings, Earthing Cable, Patch cords, SFP Module, Cable/ Pach Cord Connectors, Labelling and  Dummy Plates in unused slots |  |  |  | Yes |  |  |  |  |
| Check for LED Status for proper equipment  working |  |  |  | Yes |  |  |  |  |
| Checking of LVD setting |  |  |  |  |  | Yes |  |  |
| OLT PM (All activities as per WO) |  |  |  | Yes |  |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air  Filter and FAN Module |  |  |  | Yes |  |  |  |  |
| Check the Power and Grounding  Connectivity using Multimeter |  |  |  |  |  | Yes |  |  |
| Check for proper closing of doors |  |  |  | Yes |  |  |  |  |
| Cleaning of the Equipment with duster |  |  |  | Yes |  |  |  |  |
| Hex ODC Preventive Maintenance |  |  |  | Yes |  |  |  | All the activity of ODC PM |
| Standalone OLT Site | Inspect for all Cable Proper Routings, Earthing Cable, Patch cords, SFP Module, Cable/ Pach Cord Connectors, Labelling and  Dummy Plates in unused slots |  |  |  | Yes |  |  |  |  |
| Check for LED Status for proper equipment  working |  |  |  | Yes |  |  |  |  |
| Checking of LVD setting |  |  |  |  |  | Yes |  |  |
| OLT PM (All activities as per WO) |  |  |  | Yes |  |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air  Filter and FAN Module |  |  |  | Yes |  |  |  |  |
| Check the Power and Grounding  Connectivity using Multimeter |  |  |  |  |  | Yes |  |  |
| Check for proper closing of doors |  |  |  | Yes |  |  |  |  |
| Cleaning of the Equipment with duster |  |  |  | Yes |  |  |  |  |
| Hex ODC Preventive and Corrective  Maintenance |  |  |  | Yes |  |  |  |  |
| Infra (SMPS/BB/SPD/Electric Meter etc.) Equipment’s\*\*\* Preventive /Corrective  maintenance |  |  |  | Yes |  |  |  | All the activities of SMPS- BB applicable |

\* FTTx F&D operation all the activities performed in Intracity Fiber applicable for F&D also

\*\* Break-down maintenance - as and when occurred.

\*\*\* All the activities of Infra Equipment’s (SMPS-BB) applicable

1. **Activities for Intercity (NLD) & Intracity (INC) OFC routes**

| **Intercity(NLD) & Intracity(INC) OFC routes** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Route | Elements | Tasks to be Performed | D | W | F | M | Q | H | Y |
| Intercity | Ducts / Cables | Surveillance of route: |  |  |  |  |  |  |  |
| Network is LIVE (No expansion) |  | Yes |  |  |  |  |  |
| Network ready but Not LIVE (No expansion) |  | Yes |  |  |  |  |  |
| Span under any Kind of expansion (LIVE/Not LIVE) | Yes |  |  |  |  |  |  |
| checking of LVD setting | Checking of MH covers, Splice chamber, duct caps, etc. |  |  |  | Yes |  |  |  |
| Hand Hole | Checking of HH covers, duct caps etc. |  |  |  | Yes |  |  |  |
| Markers | Checking of Route Markers |  |  |  | Yes |  |  |  |
| Aerial | Cable Height, sag verification of Aerial Sections |  |  | Yes |  |  |  |  |
| OFC route | Walkthrough of OFC Route |  |  |  |  |  | Yes |  |
| OFC testing | Testing of all dark fibers for Attenuation and splice loss and continuity.(includes Bidirectional OTDR and LSPM testing @ 1550nm)  when network is LIVE |  |  |  |  | Yes |  |  |
| OFC testing | Testing of all dark fibers for Attenuation and splice loss and continuity etc.(includes Unidirectional OTDR and LSPM testing @ 1550nm) when network LIVE ( for fault update) |  |  |  | Yes |  |  |  |
| OFC testing | Testing of 1 Fibre /Tube ) dark fibers for Attenuation and splice loss and continuity includes Unidirectional OTDR and LSPM testing @  1550nm) when network ready but NOTLIVE |  |  |  | Yes |  |  |  |
| As Built | As Built Updation in GIS, Single line diagram preparation and update |  |  |  | Yes |  |  |  |
| Planned Event | Obtaining and completion of planned event | On need basis | | | | | | |
| RCA | RCA Preparation of critical Faults | On need basis | | | | | | |
| Test & Measuring Instruments | Check Instruments calibration status |  |  |  |  |  |  | Yes |
| Cleaning and Upkeep of OTDR / Splice M/c, power meter etc. |  |  |  | Yes |  |  |  |
| Third party  damages | Lodging complaints against third party damages | On need basis | | | | | | |
| PM Compliance | Ensuring 100% compliance for PM through SAP | As per frequency defined in SAP | | | | | | |
| Documentation | Network mitra , POLICE, Important Infra agency details, other telco  details data base, Report preparation, etc. | Yes |  |  |  |  |  |  |
| Intracity | Ducts / Cables | Surveillance of route: |  |  |  |  |  |  |  |
| Network is LIVE (No expansion) |  | Yes |  |  |  |  |  |
| Network ready but Not LIVE (No expansion) |  | Yes |  |  |  |  |  |
| Span under any Kind of expansion ( LIVE/Not LIVE) | Yes |  |  |  |  |  |  |
| Man Hole | Checking of MH covers, Splice chamber, duct caps, etc. |  |  |  | Yes |  |  |  |
| Hand Hole | Checking of HH covers, duct caps etc. |  |  |  | Yes |  |  |  |
| Markers | Checking of Route Markers |  |  |  | Yes |  |  |  |
| Aerial | Cable Height, sag verification of Aerial Sections |  |  | Yes |  |  |  |  |
| OFC route | Walkthrough of OFC Route |  |  |  |  |  | Yes |  |
| OFC testing | Testing of all dark fibers for Attenuation and splice loss and continuity  .(includes Bidirectional OTDR and LSPM testing @ 1550nm) when network is LIVE |  |  |  |  | Yes |  |  |
| OFC testing | Testing of 1 Ribbon/Tube dark fibers for Attenuation and splice loss and continuity etc.(includes Unidirectional OTDR and LSPM testing @ 1550nm) when network LIVE ( for fault update) |  |  |  | Yes |  |  |  |
| OFC testing | Testing of 1Ribbon /Tube ) dark fibers for Attenuation and splice loss and continuity includes Unidirectional OTDR and LSPM testing @ 1550nm) when network ready but NOTLIVE |  |  |  | Yes |  |  |  |
| As Built | As Built Updation in GIS, Single line diagram preparation and update |  |  |  | Yes |  |  |  |
| Planned Event | Obtaining and completion of planned event | On need basis | | | | | | |
| RCA | RCA Preparation of critical Faults | On need basis | | | | | | |
| Test & Measuring Instruments | Check Instruments calibration status |  |  |  |  |  |  | Yes |
| Cleaning and Upkeep of OTDR / Splice M/c, power meter etc. |  |  |  | Yes |  |  |  |
| Third party  damages | Lodging complaints against third party damages | On need basis | | | | | | |
| PM Compliance | Ensuring 100% compliance for PM through SAP | As per frequency defined in SAP | | | | | | |
| Documentation | Network mitra , POLICE, Important Infra agency details, other telco  details data base, Report preparation, etc. | Yes |  |  |  |  |  |  |

1. **Activities for Facility Type - eNodeB / gNodeB**

| **Facility Type - eNodeB / gNodeB** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Equipment /  Activity Category | Activities Tasks to be Performed | D | W | M | Q | H | Y |
| General | Cleaning of Filters, checking of electrical wiring, amperage,  controller setting, overload relay |  |  |  | Yes |  |  |
| Opening and closing of the IME / climbing for OME |  |  |  | Yes |  |  |
| BB & SMPS | Checking of Battery & SMPS, cleaning of rectifier modules |  |  | Yes |  |  |  |
| Checking of health of Surge Protection Device (SPD) |  |  | Yes |  |  |  |
| Checking of LVD setting |  |  | Yes |  |  |  |
| Checking of Battery voltage |  |  | Yes |  |  |  |
| Checking & tightness of MCB, Contactors, DCDB, Terminals |  |  |  |  |  | Yes |
| Battery Functional Discharge Test |  |  |  |  |  | Yes |
| Electrical | Readings of energy meters |  |  | Yes |  |  |  |
| Visual Inspection of meter box condition, Electrical switch |  |  |  |  |  | Yes |
| Earthing system | Checking of connections of earth pits, earth grid. |  |  |  |  |  | Yes |
| Watering of pits |  |  |  | Yes |  |  |
| Checking earth resistance value of earth pit |  |  |  |  |  | Yes |
| Lightning protection checking |  |  |  |  |  | Yes |
| ODC | Checking of FAN operating condition & noise |  |  | Yes |  |  |  |
| Door / gasket - check for healthiness / condition |  |  | Yes |  |  |  |
| Alarm extension  to NOC | Simulation of alarm extension for all Utilities / SAS to NOC / SNOC  and rectification, as required |  |  |  |  |  | Yes |
| Alarm Assurance | E2E alarm testing (NOC/LSMR/SAS) |  |  | Yes |  |  |  |
| Alarm rectification for not communicating E2E |  |  | Yes |  |  |  |
| Fire Alarm System | Checking of Fire detection & security alarms |  |  |  | Yes |  |  |
| Annual checking of Fire detection & security alarms |  |  |  |  |  | Yes |
| Misc. | Checking of door locking system / access control |  |  |  | Yes |  |  |
| Security camera functionality test |  |  |  | Yes |  |  |
| Checking of EMF Signage boards (3) condition & reporting any  discrepancy and fixing (FIM), if not available / damaged |  |  | Yes |  |  |  |
| Premonsoon checks |  |  |  |  |  | Yes |
| Bolt tightening |  |  |  |  |  | Yes |
| Antenna Orientation and weatherproofing |  |  |  |  |  | Yes |
| Civil / Mech. Works | Checking & tightening of fastenters on mast |  |  |  |  |  | Yes |
| Documentation | Documentation & Report preparation |  |  | Yes |  |  |  |
| Travel time | Travel time from MP location to eNodeB/gNodeB & to next  eNodeB/gNodeB |  |  | Yes |  |  |  |
| RAN/IP Elements/ MW (eNB)/ gNB, eBand, High Capacity-UBR | Check for LED Status for proper equipment working |  |  | Yes |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air Filter and FAN Modules |  |  | Yes |  |  |  |
| Inspect for all Cable proper routings, Earthing Cable, eCPRI/ CPRI /  IF/ RF Cable, GPS Cable, RET Cable, Patch cords, Backhaul Cable, SFP Module, GPS Antenna, Surge arrestor, Cable/ Patch Cord Connectors, Gland, RJ45 login cable & Connector, Labelling and Dummy Plates in unused slots |  |  |  | Yes |  |  |
| Check the Power and Grounding Connectivity using Multimeter |  |  |  | Yes |  |  |
| Check for proper closing of doors (eNodeB, gNodeB, ODC, etc) |  |  | Yes |  |  |  |
| Cleaning of the Equipment with duster |  |  | Yes |  |  |  |
| Check MW & UBR Antenna orientation & weatherproofing |  |  |  |  | Yes |  |
| Support activities (Node visibility) |  |  |  |  |  | Yes |
| Support for Optical & Ethernet BER testing |  |  |  |  |  | Yes |
| Check MW Antenna Interface with OMT, Blanking Plate, LOS & Antenna tightness, Support road, Clamps & Pole Mount for proper  tightness to hold the antenna position |  |  |  |  | Yes |  |
| Check Roxtec Cable Entry condition |  |  |  | Yes |  |  |
| Check MW ODU Login & Patch cord cable and Connector at both  end |  |  |  | Yes |  |  |
| Check Power card, Earthing & Power cable termination at. (gNodeB, BBU, GPS Arrestor, RRH, CSS, MW ODU, UBR Radio AC &  DC POE,ODU BNC Connector Cap) |  |  |  | Yes |  |  |
| Check gNodeB, eNB & AG1 Device Temperature, Clean FAN & Filter |  |  | Yes |  |  |  |
| Removing unused cables and Unused all port should be covered by cap for dust proof. Check for gaps within racks or excess cabling that may affect the cooling performance. |  |  |  | Yes |  |  |
| Check for corrosion on router or around router. |  |  | Yes |  |  |  |

1. **Activities for Facility Type - eNodeB/gNodeB (GBM / GBT / RTT / RTP)/ IPCOLO Sites with utility asset provided by Jio to be added (RJIL/GTL)**

| **Facility Type - eNodeB/gNodeB (GBM / GBT / RTT / RTP)/ IPCOLO Sites with utility asset provided by Jio to be added (RJIL/GTL)** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Equipment /  Activity Category | Activities Tasks to be Performed | D | W | M | Q | H | Y |
| General | Visual inspection of site with respect to housekeeping, cleanliness,security,ingress of water, sealing at all cable entry points/ Roxtec,rusting,unauthorized tapping of power from EB Meter Box/ PDB, threat of fire due to wild growth/ piling of  combustible material in close vicinity, |  |  | Yes |  |  |  |
| Opening and closing of the IME / climbing for OME |  |  | Yes |  |  |  |
| EB Supply | Visual Inspection of the connection of HT wire with Overhead line, Gang operated switch (GOD), Dropout fuses and lightning arrestors including the availability and condition of GOD, Dropout Fuses, and Lightening arrestors and Supporting insulators. The SP technician is not supposed to touch or go Near the live/exposed  conductors. |  |  | Yes |  |  |  |
| Visual inspection of transformer with respect to oil leakage, oil level, condition of HT/ LT termination, sealing of cable entry in the Transformer cable boxes, Condition of Silica Gel breather, Support/anchoring of Transformer on DP  structure, |  |  | Yes |  |  |  |
| Checking of LVD setting |  |  | Yes |  |  |  |
| Visual Inspection of meter box and electrical switch/MCB , with respect to  pilfilarge/damage and connection and condition cables |  |  | Yes |  |  |  |
| ODC | Visual inspection and checking of the ODC as per activities mentioned in Annexure  no. VI (A) |  |  |  | Yes |  |  |
| Cleaning of Filters, (The frequency of cleaning will differ from site to site as per dust  hazard/High temp. alarm recorded in system) |  |  | Yes |  |  |  |
| SMPS | Visual inspection and checking of the SMPS as per activities mentioned in  Annexure no. VI (A) |  |  | Yes |  |  |  |
| Checking & tightness of connections at MCB, Contactors, DCDB, Terminal blocks |  |  |  |  |  | Yes |
| Replacement of defective Rectifier, Controller, MCB, SPD, including transportation  of new HW from MP and return of defective HW to MP | As and when required | | | | | |
| Battery | Visual inspection and checking of the Battery as per activities mentioned in  Annexure no. VI (A) |  |  | Yes |  |  |  |
| Replacement of defective Battery module, Fuses, including transportation of new  HW from MP and return of defective HW to MP | As and when required | | | | | |
| Battery Functional Discharge Test |  |  |  |  |  | Yes |
| Earthing system | Checking of the earthing as per activities mentioned in Annexure no. VI (A) |  |  |  |  |  | Yes |
| Watering of pits |  |  |  | Yes |  |  |
| Checking earth resistance value of earth pit |  |  |  |  |  | Yes |
| Alarm extension to NOC (utility, fire,  SAS) | Simulation of alarm extension for all Utilities to NOC and reporting the defects if  any to O&M Lead/Engineer/SME |  |  |  |  | Yes |  |
| Checking of Fire & security (door locking, access control and security camera )  alarms and reporting the defects if any to O&M Lead/Engineer/SME |  |  |  | Yes |  |  |
| Misc | Checking of EMF Signage boards (3) condition & reporting any discrepancy and fixing (FIM), if not available / damaged |  |  | Yes |  |  |  |
| Premonsoon checks as per the check sheet in SAP |  |  |  |  |  | Yes |
| Bolt tightening |  |  |  |  |  |  |
| Antenna Orientation and weatherproofing |  |  |  |  |  | Yes |
| GBM | Checking of GBM as per the check sheet in SAP |  |  |  |  |  | Yes |
| GBM | Checking of GBT as per the check sheet in SAP |  |  |  |  |  | Yes |
| Documentation | Documentation & Report preparation as per formats in SAP |  |  | Yes |  |  |  |
| Travel time | Travel time from TRT location to eNodeB/gNodeB & to next eNodeB/gNodeB |  |  | Yes |  |  |  |
| RAN/IP Elements/ MW  - (eNB/) gNB, eBand, High Capacity-UBR | Check for LED Status for proper equipment working |  |  | Yes |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air Filter and FAN Modules |  |  | Yes |  |  |  |
| Inspect for all Cable proper routings, Earthing Cable, eCPRI, CPRI / IF/ RF Cable, GPS Cable, RET Cable, Patch cords, Backhaul Cable, SFP Module, GPS Antenna, Surge arrestor , Cable/ Patch Cord Connectors, Gland, RJ45 login cable &  Connector,Labelling and Dummy Plates in unused slots |  |  |  | Yes |  |  |
| Check the Power and Grounding Connectivity using Multimeter |  |  |  | Yes |  |  |
| Check for proper closing of doors (ISP service racks) |  |  | Yes |  |  |  |
| Cleaning of the Equipment with duster ( details required) |  |  | Yes |  |  |  |
| Support activities (Node visibility) |  |  |  |  |  | Yes |
| Replacement/swapping of antenna, eNB, gNB, RRH, IP elements (Router/MDS/L2 Switch...), MW, UBR, eBand, High Capacity-UBR as part of routine maintenance. | Yes |  |  |  |  |  |
| Support for Optical & Ethernet BER testing |  |  |  |  |  | Yes |
| Check MW Antenna Interface with OMT, Blanking Plate, LOS & Antenna tightness, Support road, Clamps & Pole Mount for proper tightness to hold the antenna  Position. |  |  |  |  | Yes |  |
| Check Roxtec Cable Entry condition |  |  |  | Yes |  |  |
| Check MW ODU Login & Patch cord cable and Connector at both end |  |  |  | Yes |  |  |
| Check Power card, Earthing & Power cable termination at. (gNodeB, BBU, GPS Arrestor, RRH, CSS, MW ODU, UBR Radio AC & DC POE,ODU BNC Connector Cap) |  |  |  | Yes |  |  |
| Check gNodeB, eNB & AG1 Device Temperature, Clean FAN & Filter |  |  | Yes |  |  |  |
| Removing unused cables and Unused all port should be covered by cap for dust  proof. Check for gaps within racks or excess cabling that may affect the cooling performance. |  |  |  | Yes |  |  |
| Check for corrosion on router or around router. |  |  | Yes |  |  |  |

1. **Activities for Facility Type - eNodeB/gNodeB + AG1 + OLT**

| **Facility Type - eNodeB/gNodeB + AG1 + OLT** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Equipment /  Activity Category | Activities Tasks to be Performed | D | W | M | Q | H | Y |
| General | Cleaning of Filters, checking of electrical wiring, amperage, controller setting, overload relay |  |  |  | Yes |  |  |
| Opening and closing of the IME / climbing for OME |  |  |  | Yes |  |  |
| BB & SMPS | Checking of Battery & SMPS, cleaning of rectifier modules |  |  | Yes |  |  |  |
| Checking of health of Surge Protection Device (SPD) |  |  | Yes |  |  |  |
| Checking of LVD setting |  |  | Yes |  |  |  |
| Checking of Battery voltage |  |  | Yes |  |  |  |
| Checking & tightness of MCB, Contactors, DCDB, Terminals |  |  |  |  |  | Yes |
| Battery Functional Discharge Test |  |  |  |  |  | Yes |
| Electrical | Readings of energy meters |  |  | Yes |  |  |  |
| Visual Inspection of meter box condition, Electrical switch |  |  |  |  |  | Yes |
| Earthing system | Checking of connections of earth pits, earth grid |  |  |  |  |  | Yes |
| Watering of pits |  |  |  | Yes |  |  |
| Checking earth resistance value of earth pit |  |  |  |  |  | Yes |
| Lightning protection checking |  |  |  |  |  | Yes |
| ODC | Checking of FAN operating condition & noise |  |  | Yes |  |  |  |
| Door / gasket - check for healthiness / condition |  |  | Yes |  |  |  |
| Alarm extension  to NOC | Simulation of alarm extension for all Utilities / SAS to NOC / SNOC  and rectification, as required |  |  |  |  |  | Yes |
| Alarm Assurance | E2E alarm testing (NOC/LSMR/SAS) |  |  | Yes |  |  |  |
| Alarm rectification for not communicating E2E |  |  | Yes |  |  |  |
| Fire Alarm System | Checking of Fire detection & security alarms |  |  |  | Yes |  |  |
| Annual checking of Fire detection & security alarms |  |  |  |  |  | Yes |
| Misc. | Checking of door locking system / access control |  |  |  | Yes |  |  |
| Security camera functionality test |  |  |  | Yes |  |  |
| Checking of EMF Signage boards (3) condition & reporting any discrepancy and fixing (FIM), if not available / damaged |  |  | Yes |  |  |  |
| Premonsoon checks |  |  |  |  |  | Yes |
| Bolt tightening |  |  |  |  |  | Yes |
| Antenna Orientation and weatherproofing |  |  |  |  |  | Yes |
| Civil / Mech. Works | Checking & tightening of fasteners on mast |  |  |  |  |  | Yes |
| Documentation | Documentation & Report preparation |  |  | Yes |  |  |  |
| Travel time | Travel time from MP location to eNodeB/gNodeB & to next  eNodeB/gNodeB |  |  | Yes |  |  |  |
| RAN/IP Elements/MW - (eNB + AG1+OLT)/ gNB, eBand, High Capacity-UBR | Check for LED Status for proper equipment working |  |  | Yes |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air Filter and FAN Modules |  |  | Yes |  |  |  |
| Inspect for all Cable proper routings, Earthing Cable, eCPRI/ CPRI /  IF/ RF Cable, GPS Cable, RET Cable, Patch cords, Backhaul Cable, SFP Module, GPS Antenna, Surge arrestor , Cable/ Patch Cord Connectors, Gland, RJ45 login cable & Connector,Labelling and  Dummy Plates in unused slots |  |  |  | Yes |  |  |
| Check the Power and Grounding Connectivity using Multimeter |  |  |  | Yes |  |  |
| Check for proper closing of doors (gNodeB, eNodeB, ODC, etc.) |  |  | Yes |  |  |  |
| Cleaning of the Equipment with duster |  |  | Yes |  |  |  |
| Check MW & UBR Antenna orientation & weatherproofing |  |  |  |  | Yes |  |
| Support activities (Node visibility) |  |  |  |  |  | Yes |
| Support for Optical & Ethernet BER testing |  |  |  |  |  | Yes |
| Replacement/swapping of antenna, eNB, gNB, RRH, IP elements (Router/MDS/L2 Switch...), MW, UBR, eBand, High Capacity-UBR as part of routine maintenance. | Yes |  |  |  |  |  |
| Check MW Antenna Interface with OMT, Blanking Plate, LOS &  Antenna tightness, Support road, Clamps & Pole Mount for proper tightness to hold the antenna position |  |  |  |  | Yes |  |
| Check Roxtec Cable Entry condition |  |  |  | Yes |  |  |
| Check MW ODU Login & Patch cord cable and Connector at both  end |  |  |  | Yes |  |  |
| Check Power card, Earthing & Power cable termination at. (BBU, GPS Arrestor, RRH, CSS, MW ODU, UBR Radio AC & DC POE,ODU  BNC Connector Cap) |  |  |  | Yes |  |  |
| Check gNodeB, eNB & AG1 Device Temperature, Clean FAN & Filter |  |  | Yes |  |  |  |
| Removing unused cables and Unused all port should be covered by cap for dust proof. Check for gaps within racks or excess cabling  that may affect the cooling performance. |  |  |  | Yes |  |  |
| Check for corrosion on router or around router. |  |  | Yes |  |  |  |

1. **Activities for Facility Type - eNodeB/gNodeB + AG1 + OLT**

| **Facility Type - eNodeB/gNodeB + AG1 + OLT (with DG) / COW / BTS** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Equipment /**  **Activity Category** | **Activities Tasks to be Performed** | **D** | **W** | **M** |  |  | **Q** | **H** | **Y** |
| General | Cleaning of Filters, checking of electrical wiring, amperage, controller setting, overload relay |  |  |  |  |  | Yes |  |  |
| Opening and closing of the IME / climbing for OME |  |  |  |  |  | Yes |  |  |
| DG | Checking of lub oil in engine & top up if reqd |  | Yes |  |  |  |  |  |  |
| Checking of battery terminals, battery sp gravity/color indication |  |  | Yes |  |  |  |  |  |
| Checking of LVD setting |  |  | Yes |  |  |  |  |  |
| Cleaning of air filter for D.G.Set |  |  | Yes |  |  |  |  |  |
| Checking of coolant water in radiators for D.G.Set |  | Yes |  |  |  |  |  |  |
| Checking & record of parameters for D.G.Set |  | Yes |  |  |  |  |  |  |
| Checking of leakages, Fuel & injector pipes, exhaust manifold -oil  filter & other area, coolant hose |  |  | Yes |  |  |  |  |  |
| Checking of fuel level & recording for D.G.Set |  | Yes |  |  |  |  |  |  |
| Emission visual check |  |  | Yes |  |  |  |  |  |
| Fuel filling as and when required |  |  |  |  |  |  |  |  |
| BB & SMPS | Checking of Battery & SMPS, cleaning of rectifier modules |  |  | Yes |  |  |  |  |  |
| Checking of health of Surge Protection Device (SPD) |  |  | Yes |  |  |  |  |  |
| Checking of LVD setting |  |  | Yes |  |  |  |  |  |
| Checking of Battery voltage |  |  | Yes |  |  |  |  |  |
| Checking & tightness of MCB, Contactors, DCDB, Terminals |  |  |  |  |  |  |  | Yes |
| Battery Functional Discharge Test |  |  |  |  |  |  |  | Yes |
| Electrical | Inspection of AMF Panel for cleanliness, tightening of connections,  etc. |  |  |  |  |  | Yes |  |  |
| Visual Inspection of meter box condition, Electrical switch |  |  |  |  |  |  |  | Yes |
| Readings of energy meters |  |  | Yes |  |  |  |  |  |
| Earthing system | Checking of connections of earth pits, earth grid, |  |  |  |  |  |  |  | Yes |
| Watering of pits |  |  |  |  |  | Yes |  |  |
| Checking earth resistance value of earth pit |  |  |  |  |  |  |  | Yes |
| Lightning protection checking |  |  |  |  |  |  |  | Yes |
| ODC | Checking of FAN operating condition & noise |  |  | Yes |  |  |  |  |  |
| Door / gasket - check for healthiness / condition |  |  | Yes |  |  |  |  |  |
| Alarm extension  to NOC | Simulation of alarm extension for all Utilities / SAS to NOC / SNOC  and rectification, as required |  |  |  |  |  |  |  | Yes |
| Alarm Assurance | Checking of Fuel sensor, Zabbix Connecting cable Intact |  | Yes |  |  |  |  |  |  |
| E2E alarm testing (NOC/LSMR/Zabbix/SAS) |  |  | Yes |  |  |  |  |  |
| Alarm rectification for not communicating E2E |  |  | Yes |  |  |  |  |  |
| Fire Alarm System | Checking of Fire detection & security alarms |  |  |  |  |  | Yes |  |  |
| Annual checking of Fire detection & security alarms |  |  |  |  |  |  |  | Yes |
| Misc. | Checking of door locking system / access control |  |  |  |  |  | Yes |  |  |
| Security camera functionality test |  |  |  |  |  | Yes |  |  |
| Checking of EMF Signage boards (3) condition & reporting any discrepancy and fixing (FIM), if not available / damaged |  |  | Yes |  |  |  |  |  |
| Premonsoon checks |  |  |  |  |  |  |  | Yes |
| Bolt tightening |  |  |  |  |  |  |  | Yes |
| Antenna Orientation and weatherproofing |  |  |  |  |  |  |  | Yes |
| Civil / Mech. Works | Checking & tightening of fasteners on mast |  |  |  |  |  |  |  | Yes |
| Documentation | Documentation & Report preparation |  | Yes |  |  |  |  |  |  |
| Travel time | Travel time from MP location to eNodeB/gNodeB & to next  eNodeB/gNodeB |  | Yes |  |  |  |  |  |  |
| RAN/IP Elements/MW - (eNB + AG1+OLT)/ gNB, eBand, High Capacity-UBR | Check for LED Status for proper equipment working |  |  | Yes |  |  |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air Filter and FAN Modules |  |  | Yes |  |  |  |  |  |
| Inspect for all Cable proper routings, Earthing Cable, eCPRI/ CPRI /  IF/ RF Cable, GPS Cable, RET Cable, Patch cords, Backhaul Cable, SFP Module, GPS Antenna, Surge arrestor , Cable/ Patch Cord Connectors, Gland, RJ45 login cable & Connector,Labelling and Dummy Plates in unused slots |  |  |  |  |  | Yes |  |  |
| Check the Power and Grounding Connectivity using Multimeter |  |  |  |  |  | Yes |  |  |
| Check for proper closing of doors (gNodeB, eNodeB, ODC, etc.) |  |  | Yes |  |  |  |  |  |
| Cleaning of the Equipment with duster |  |  | Yes |  |  |  |  |  |
| Check MW & UBR Antenna orientation & weatherproofing |  |  |  |  |  |  | Yes |  |
| Support activities (Node visibility) |  |  |  |  |  |  |  | Yes |
| Support for Optical & Ethernet BER testing |  |  |  |  |  |  |  | Yes |
| Replacement/swapping of antenna, eNB, gNB, RRH, IP elements (Router/MDS/L2 Switch.), MW, UBR, eBand, High Capacity-UBR as part of routine maintenance. | Yes |  |  |  |  |  |  |  |
| Check MW Antenna Interface with OMT, Blanking Plate, LOS & Antenna tightness, Support road, Clamps & Pole Mount for proper  tightness to hold the antenna position |  |  |  |  |  |  | Yes |  |
| Check Roxtec Cable Entry condition |  |  |  |  |  | Yes |  |  |
| Check MW ODU Login & Patch cord cable and Connector at both  end |  |  |  |  |  | Yes |  |  |
| Check Power card, Earthing & Power cable termination at. (gNodeB, BBU, GPS Arrestor, RRH, CSS, MW ODU, UBR Radio AC &  DC POE,ODU BNC Connector Cap) |  |  |  |  |  | Yes |  |  |
| Check eNB, gNodeB & AG1 Device Temperature, Clean FAN & Filter |  |  | Yes |  |  |  |  |  |
| Removing unused cables and Unused all port should be covered by cap for dust proof. Check for gaps within racks or excess cabling that may affect the cooling performance. |  |  |  |  |  | Yes |  |  |
| Check for corrosion on router or around router. |  |  | Yes |  |  |  |  |  |

1. **Activities for Facility Type - IP CoLo**

| **Facility Type - IP CoLo** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Equipment /**  **Activity Category** | Activities Tasks to be Performed | D | W | M | Q | H | Y |
| RAN/IP  Elements/MW/OLT - (IP CoLo)/ eNB,gNB, eBand, High Capacity-UBR | Check for LED Status for proper equipment working |  |  | Yes |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air Filter and FAN Modules |  |  | Yes |  |  |  |
| Inspect for all Cable proper routings, Earthing Cable, eCPRI/ CPRI/ IF/ RF Cable, GPS Cable, RET Cable, Patch cords,Backhaul Cable, SFP Module, GPS Antenna, Surge arrestor , Cable/ Patch Cord Connectors, Gland, RJ45 login cable & Connector, Labelling and Dummy Plates in unused slots |  |  |  | Yes |  |  |
| Check the Power and Grounding Connectivity using  Multimeter |  |  |  | Yes |  |  |
| Check for proper closing of doors (GBM, ODC) |  |  | Yes |  |  |  |
| Cleaning of the Equipment with duster |  |  | Yes |  |  |  |
| Check MW & UBR Antenna orientation and  weatherproofing |  |  |  |  | Yes |  |
| Support activities (Node visibility) |  |  |  |  |  | Yes |
| Support for Optical & Ethernet BER testing |  |  |  |  |  | Yes |
| Replacement/swapping of antenna, eNB, gNB, RRH, IP elements (Router/MDS/L2 Switch.), MW, UBR, eBand, High Capacity-UBR as part of routine maintenance. | Yes |  |  |  |  |  |
| Check MW Antenna Interface with OMT, Blanking Plate, LOS & Antenna tightness, Support road, Clamps & Pole Mount for proper tightness to hold the antenna position |  |  |  |  | Yes |  |
| Check Roxtec Cable Entry condition |  |  |  | Yes |  |  |
| Check MW ODU Login & Patch cord cable and Connector at both end |  |  |  | Yes |  |  |
| Check Power card, Earthing & Power cable termination at. (gNodeB, BBU, GPS Arrestor, RRH, CSS, MW ODU, UBR Radio AC & DC POE,ODU BNC Connector Cap) |  |  |  | Yes |  |  |
| Check AG1 Device Temperature, FAN Status, gNodeB, eNB FAN filter Cleaning |  |  |  | Yes |  |  |
| Removing unused cables and Unused all port should be  covered by cap for dust proof. Check for gaps within racks or excess cabling that may affect the cooling performance. |  |  |  | Yes |  |  |
| Check for corrosion on router or around router |  |  |  |  |  | Yes |
| Inspect all the surge protectors or power strips on a regular basis to ensure that they are not damaged or have any signs of wear and tear or damaged by rodents |  |  |  |  |  | Yes |
| Visual Check Automation status of DG set & DG battery  availability at site.snapshot for the same |  |  | Yes |  |  |  |
| Visual Check Battery status at the site |  |  | Yes |  |  |  |
| Visual Check of SMPS & PAC machine at site. Report the same. |  |  | Yes |  |  |  |
| Misc. | Checking of Earthing connections / resistance and input  DC voltage at ODC end |  |  |  | Yes |  |  |
| Checking of EMF Signage boards (3 nos.) condition &  reporting any discrepancy and fixing (only on ODC), if not available / damaged.Signage board is FIM |  |  | Yes |  |  |  |
| Premonsoon checks |  |  |  |  |  | Yes |
| Reporting for Shelter leakage |  |  |  |  |  | Yes |
| Reporting for vegetation and Site Hygine |  |  |  | Yes |  |  |
| Antenna Orientation and weatherproofing |  |  |  |  |  | Yes |
| Reporting for any Owner/site access issues |  |  | Yes |  |  |  |
| Documentation | Documentation & Report preparation |  |  | Yes |  |  |  |
| Travel time | Travel time from MP location to site & to next site |  |  | Yes |  |  |  |
| ODC | Checking of FAN operating condition & noise |  |  | Yes |  |  |  |
| Door / gasket - check for healthiness / condition |  |  | Yes |  |  |  |
| Alarm extension  to NOC | Simulation of alarm extension to NOC and rectification, as  required |  |  |  |  |  | Yes |
| Alarm Assurance | E2E alarm testing (NOC/LSMR etc.) |  |  | Yes |  |  |  |
| Alarm rectification for not communicating E2E |  |  | Yes |  |  |  |

1. **Activities for Facility Type - AG1 (NLD)**

| Facility Type - AG1 (NLD) | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Equipment / Activity Category | Activities Tasks to be Performed | D | W | M | Q | H | Y |
| PAC / EFC | Cleaning of Air Filters |  |  | Yes |  |  |  |
| Cleaning of cooling Coils |  |  |  | Yes |  |  |
| Checking of unit vibration & noise(By hand & hearing) |  |  | Yes |  |  |  |
| Checking of compressor pressure HP / LP |  |  |  |  | Yes |  |
| Checking of LVD setting |  |  |  | Yes |  |  |
| DG | Checking of lub oil in engine & top up if reqd |  | Yes |  |  |  |  |
| Checking of battery terminals, battery sp gravity/color indication |  |  | Yes |  |  |  |
| Checking of fan belts |  |  | Yes |  |  |  |
| Cleaning of air filter for D.G.Set |  |  | Yes |  |  |  |
| Checking of water in radiators for D.G.Set |  | Yes |  |  |  |  |
| Checking & record of parameters for D.G.Set |  | Yes |  |  |  |  |
| Checking of leakages, Fuel & injector pipes, exhaust manifold -oil  filter & other area, coolant hose |  |  | Yes |  |  |  |
| Checking of fuel level & recording for D.G.Set |  | Yes |  |  |  |  |
| Emission visual check |  |  | Yes |  |  |  |
| AMF panel wiring tightness check |  |  |  | Yes |  |  |
| Fuel filling as and when required |  |  |  |  |  |  |
| BB & SMPS | Checking of Battery & SMPS, cleaning of rectifier modules |  |  | Yes |  |  |  |
| Checking of health of Surge Protection Device (SPD) |  |  | Yes |  |  |  |
| Checking of LVD setting |  |  | Yes |  |  |  |
| Checking of Battery voltage |  |  | Yes |  |  |  |
| Checking & tightness of MCB, Contactors, DCDB, Terminals |  |  |  |  |  | Yes |
| Battery Functional Discharge Test |  |  |  |  |  | Yes |
| Electrical Panel | Readings of energy meters |  |  | Yes |  |  |  |
| Visual inspection of pole mounted transformer, meter box |  |  | Yes |  |  |  |
| Checking, Replacement of bulbs, tube lights |  |  |  | Yes |  |  |
| Earthing system | Checking of connections of earth pits, earth grid, |  |  |  |  |  | Yes |
| Watering of pits |  |  | Yes |  |  |  |
| Checking earth resistance value of earth pit |  |  |  |  |  | Yes |
| Lightning protection checking |  |  |  |  |  | Yes |
| Alarm extension  to NOC | Simulation of alarm extension for all Utilities / SAS to NOC / SNOC  and rectification, as required |  |  |  |  |  | Yes |
| Alarm Assurance | Checking of Fuel sensor, Zabbix Connecting cable Intact |  | Yes |  |  |  |  |
| E2E alarm testing (NOC/LSMR/Zabbix/SAS) |  |  | Yes |  |  | Yes |
| Alarm rectification for not communicating E2E |  |  | Yes |  |  |  |
| Fire Alarm System | Checking of Fire detection & security alarms |  |  |  | Yes |  |  |
| Annual checking of Fire detection & security alarms |  |  |  |  |  | Yes |
| Miscellaneous | Equipment room housekeeping (inside shelter) |  |  |  | Yes |  |  |
| Checking of door locking system / access control |  |  |  | Yes |  |  |
| Security camera functionality test |  |  |  | Yes |  |  |
| Checking of EMF Signage boards (3) condition & reporting any  discrepancy and fixing (FIM), if not available / damaged |  |  | Yes |  |  |  |
| Premonsoon checks |  |  |  |  |  | Yes |
| Bolt tightening |  |  |  |  |  | Yes |
| Antenna Orientation and weatherproofing |  |  |  |  |  | Yes |
| Civil Works | Painting work checking |  |  |  |  |  | Yes |
| Water seepage / leakage checking |  |  |  |  |  | Yes |
| Road, drainage, general civil works, fencing etc. checking |  |  |  |  |  | Yes |
| Documentation | Documentation & Report preparation |  | Yes |  |  |  |  |
| Travel time | Travel time from MP to NAG1 & back |  | Yes |  |  |  |  |
| RAN / IP Elements / MW / ILA / OLT - (AG1) | Check for LED Status for proper equipment working |  |  | Yes |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air Filter and FAN Modules |  |  | Yes |  |  |  |
| Inspect for all Cable proper routings, Earthing Cable, CPRI / IF/ RF Cable, GPS Cable, RET Cable, Patch cords, Backhaul Cable, SFP Module, GPS Antenna, Surge arrestor , Cable/ Patch Cord Connectors, Gland, RJ45 login cable & Connector,Labelling and Dummy Plates in unused slots |  |  |  | Yes |  |  |
| Check the Power and Grounding Connectivity using Multimeter |  |  |  | Yes |  |  |
| Check for proper closing of doors (eNodeB, ODC, etc.) |  |  | Yes |  |  |  |
| Cleaning of the Equipment with duster |  |  | Yes |  |  |  |
| Check MW & UBR Antenna orientation & weatherproofing |  |  |  |  | Yes |  |
| Support activities (Node visibility) |  |  |  |  |  | Yes |
| Support for Optical & Ethernet BER testing |  |  |  |  |  | Yes |
| Check MW Antenna Interface with OMT, Blanking Plate, LOS & Antenna tightness, Support road, Clamps & Pole Mount for proper  tightness to hold the antenna position |  |  |  |  | Yes |  |
| Check Roxtec Cable Entry condition |  |  |  | Yes |  |  |
| Check MW ODU Login & Patch cord cable and Connector at both  end |  |  |  | Yes |  |  |
| Check Power card, Earthing & Power cable termination at. (BBU, GPS Arrestor, RRH, CSS, MW ODU, UBR Radio AC & DC POE,ODU  BNC Connector Cap) |  |  |  | Yes |  |  |
| Check eNB & AG1 Device Temperature, Clean FAN & Filter |  |  | Yes |  |  |  |
| Removing unused cables and Unused all port should be covered by cap for dust proof. Check for gaps within racks or excess cabling that may affect the cooling performance. |  |  |  | Yes |  |  |
| Check for corrosion on router or around router. |  |  | Yes |  |  |  |

1. **Activities for Facility Type - ILA / IS**

| **Facility Type - ILA / IS** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Equipment / Activity Category | Activities Tasks to be Performed | D | W | M | Q | H | Y |
| PAC / EFC | Cleaning of Air Filters |  |  | Yes |  |  |  |
| Cleaning of cooling Coils |  |  |  | Yes |  |  |
| Checking of unit vibration & noise (by hand & hearing) |  |  | Yes |  |  |  |
| Checking of compressor pressure HP / LP |  |  |  |  | Yes |  |
| Checking of LVD setting |  |  |  | Yes |  |  |
| DG | Checking of lub oil in engine & top up if reqd |  | Yes |  |  |  |  |
| Checking of battery terminals, battery sp gravity/color indication |  |  | Yes |  |  |  |
| Checking of fan belts |  |  | Yes |  |  |  |
| Cleaning of air filter for D.G.Set |  |  | Yes |  |  |  |
| Checking of water in radiators for D.G.Set |  | Yes |  |  |  |  |
| Checking & record of parameters for D.G.Set |  | Yes |  |  |  |  |
| Checking of leakages, Fuel & injector pipes, exhaust manifold -oil  filter & other area, coolant hose |  |  | Yes |  |  |  |
| Checking of fuel level & recording for D.G.Set |  | Yes |  |  |  |  |
| Emission visual check |  |  | Yes |  |  |  |
| AMF panel wiring tightness check |  |  |  | Yes |  |  |
| Fuel filling as and when required |  |  |  |  |  |  |
| BB & SMPS | Checking of Battery & SMPS, cleaning of rectifier modules |  |  | Yes |  |  |  |
| Checking of health of Surge Protection Device (SPD) |  |  | Yes |  |  |  |
| Checking of LVD setting |  |  | Yes |  |  |  |
| Checking of Battery voltage |  |  | Yes |  |  |  |
| Checking & tightness of MCB, Contactors, DCDB, Terminals |  |  |  |  |  | Yes |
| Battery Functional Discharge Test |  |  |  |  |  | Yes |
| Electrical Panel | Readings of energy meters |  |  | Yes |  |  |  |
| Visual inspection of pole mounted transformer, meter box |  |  | Yes |  |  |  |
| Checking, Replacement of bulbs, tube lights |  |  |  | Yes |  |  |
| Earthing system | Checking of connections of earth pits, earth grid, |  |  |  |  |  | Yes |
| Watering of pits |  |  | Yes |  |  |  |
| Checking earth resistance value of earth pit |  |  |  |  |  | Yes |
| Lightning protection checking |  |  |  |  |  | Yes |
| Alarm extension  to NOC | Simulation of alarm extension for all Utilities / SAS to NOC / SNOC  and rectification, as required |  |  |  |  |  | Yes |
| Alarm Assurance | Checking of Fuel sensor, Zabbix Connecting cable Intact |  | Yes |  |  |  |  |
| E2E alarm testing (NOC/LSMR/Zabbix/SAS) |  |  | Yes |  |  | Yes |
| Alarm rectification for not communicating E2E |  |  | Yes |  |  |  |
| Fire Alarm System | Checking of Fire detection & security alarms |  |  |  | Yes |  |  |
| Annual checking of Fire detection & security alarms |  |  |  |  |  | Yes |
| Miscellaneous | Equipment room housekeeping (inside shelter) |  | Yes |  |  |  |  |
| Checking of door locking system / access control |  |  |  | Yes |  |  |
| Security camera functionality test |  |  |  | Yes |  |  |
| Premonsoon checks |  |  |  |  |  | Yes |
| Civil Works | Painting work checking |  |  |  |  |  | Yes |
| Water seepage / leakage checking |  |  |  |  |  | Yes |
| Road, drainage, general civil works, fencing etc. checking |  |  |  |  |  | Yes |
| Documentation | Documentation & Report preparation |  | Yes |  |  |  |  |
| Travel time | Travel time from MP to ILA & back |  | Yes |  |  |  |  |
| IP Elements / Tx Mux / ILA / OLT | Inspect for all Cable Proper Routings, Earthing Cable, Patch cords, SFP Module, Cable/ Pach Cord Connectors, Labelling and Dummy  Plates in unused slots |  |  |  | Yes |  |  |
| Check for LED Status for proper equipment working |  |  | Yes |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air Filter and FAN Module |  |  | Yes |  |  |  |
| Check the Power and Grounding Connectivity using Multimeter |  |  |  | Yes |  |  |
| Check for proper closing of doors |  |  | Yes |  |  |  |
| Cleaning of the Equipment’s with duster |  |  | Yes |  |  |  |

1. **Activities for Facility Type - AG2 (NLD)**

| Facility Type - AG2 (NLD) | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Equipment /  Activity Category | Activities Tasks to be Performed | D | W | M | Q | H | Y |
| PAC | Cleaning of Air Filters |  |  | Yes |  |  |  |
| Cleaning of Cooling Coils (indoor unit) |  |  |  |  | Yes |  |
| Cleaning of Condenser Coils (outdoor unit) |  |  | Yes |  |  |  |
| Checking of unit vibration & noise (by hand & hearing) |  |  |  | Yes |  |  |
| Checking of LVD setting |  |  |  |  | Yes |  |
| Checking of electrical wiring, amperage, controller setting,  overload relay |  |  | Yes |  |  |  |
| DG | Checking of lub oil in engine & top up if reqd |  | Yes |  |  |  |  |
| Checking of battery terminals, battery sp gravity/color indication |  |  | Yes |  |  |  |
| Checking of fan belts |  |  | Yes |  |  |  |
| Cleaning of air filter for D.G.Set |  |  | Yes |  |  |  |
| Checking of water in radiators for D.G.Set |  | Yes |  |  |  |  |
| Checking & record of parameters for D.G.Set |  | Yes |  |  |  |  |
| Checking of leakages, Fuel & injector pipes, exhaust manifold -oil  filter & other area, coolant hose |  |  | Yes |  |  |  |
| Checking of fuel level & recording for D.G.Set |  | Yes |  |  |  |  |
| Emission visual check |  |  | Yes |  |  |  |
| AMF panel wiring tightness check |  |  |  | Yes |  |  |
| Fuel filling as and when required |  |  |  |  |  |  |
| BB & SMPS | Checking of Battery & SMPS, cleaning of rectifier modules |  |  | Yes |  |  |  |
| Checking of health of Surge Protection Device (SPD) |  |  | Yes |  |  |  |
| Checking of LVD setting |  |  | Yes |  |  |  |
| Checking of Battery voltage |  |  | Yes |  |  |  |
| Checking & tightness of MCB, Contactors, DCDB, Terminals |  |  |  |  |  | Yes |
| Battery Functional Discharge Test |  |  |  |  |  | Yes |
| Electrical Panel (HT & LT) | Visual inspection of pole mounted transformer / GOD switch,  meter box condition |  |  |  | Yes |  |  |
| Annual Transformer Oil checks |  |  |  |  |  | Yes |
| Readings of energy meter |  |  | Yes |  |  |  |
| Inspection of LT Panel for cleanliness, tightening of connection etc.,  cable alley inspection |  |  |  |  |  | Yes |
| Checking of outgoing feeders |  |  |  | Yes |  |  |
| Checking of Lighting and Power DB. |  |  |  |  |  | Yes |
| Checking, Replacement of bulbs, tube lights |  |  |  | Yes |  |  |
| Earthing system | Checking of connections of earth pits and earth grid. |  |  |  |  |  | Yes |
| Watering of earth pits |  |  | Yes |  |  |  |
| Checking earth resistance value of earth pit |  |  |  |  |  | Yes |
| Lightning protection checking |  |  |  |  |  | Yes |
| Alarm extension to  NOC | Simulation of alarm extension for all Utilities / SAS to NOC / SNOC  and rectification, as required |  |  |  |  |  | Yes |
| Alarm Assurance | Checking of Fuel sensor, Zabbix Connecting cable Intact |  | Yes |  |  |  |  |
| E2E alarm testing (NOC/LSMR/Zabbix/SAS) |  |  | Yes |  |  | Yes |
| Alarm rectification for not communicating E2E |  |  | Yes |  |  |  |
| Fire Alarm System | Fire alarm system simulation |  |  |  | Yes |  |  |
| Annual checking of Fire detection & security alarms |  |  |  |  |  | Yes |
| Miscellaneous | Housekeeping inside Equipment / panel room |  | Yes |  |  |  |  |
| Checking of door locking system / access control |  |  |  | Yes |  |  |
| Security camera functionality test |  |  |  | Yes |  |  |
| Premonsoon checks for cable entries, water seepage, ODU of PACs |  |  |  |  |  | Yes |
| Civil Works | Painting work checking |  |  |  |  |  | Yes |
| Water seepage / leakage checking |  |  |  |  |  | Yes |
| Road, drainage, general civil works etc. checking |  |  |  |  |  | Yes |
| Documentation | Documentation & Report preparation |  | Yes |  |  |  |  |
| Travel | Travel time from MP to AG2 & back |  | Yes |  |  |  |  |
| IP Elements/ Tx Mux/ ILA/ OLT - (AG2 NLD) | Inspect for all Cable Proper Routings, Earthing Cable, Patch cords, SFP Module, Cable/ Patch Cord Connectors, Labelling and Dummy  Plates in unused slots |  |  |  | Yes |  |  |
| Check for LED Status for proper equipment working |  |  | Yes |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air Filter |  |  | Yes |  |  |  |
| Check the Power and Grounding Connectivity using Multimeter |  |  |  | Yes |  |  |
| Check for proper closing of doors |  |  | Yes |  |  |  |
| Cleaning of the Equipment with duster |  |  | Yes |  |  |  |

1. **Activities for Facility Type - AG2 (Metro)**

| **Facility Type - AG2 (Metro)** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Equipment /  Activity Category | Activities Tasks to be Performed | D | W | M | Q | H | Y |
| PAC | Cleaning of Air Filters |  |  | Yes |  |  |  |
| Cleaning of Cooling Coils (indoor unit) |  |  |  |  | Yes |  |
| Cleaning of Condenser Coils (outdoor unit) |  |  | Yes |  |  |  |
| Checking of unit vibration & noise (by hand & hearing) |  |  |  | Yes |  |  |
| Checking of LVD setting |  |  |  |  | Yes |  |
| Checking of electrical wiring, amperage, controller setting,  overload relay |  |  | Yes |  |  |  |
| DG | Checking of lub oil in engine & top up if reqd |  | Yes |  |  |  |  |
| Checking of battery terminals, battery sp gravity/color indication |  |  | Yes |  |  |  |
| Checking of fan belts |  |  | Yes |  |  |  |
| Cleaning of air filter for D.G.Set |  |  | Yes |  |  |  |
| Checking of water in radiators for D.G.Set |  | Yes |  |  |  |  |
| Checking & record of parameters for D.G.Set |  | Yes |  |  |  |  |
| Checking of leakages, Fuel & injector pipes, exhaust manifold -oil  filter & other area, coolant hose |  |  | Yes |  |  |  |
| Checking of fuel level & recording for D.G.Set |  | Yes |  |  |  |  |
| Emission visual check |  |  | Yes |  |  |  |
| AMF panel wiring tightness check |  |  |  | Yes |  |  |
| Fuel filling as and when required |  |  |  |  |  |  |
| BB & SMPS | Checking of Battery & SMPS, cleaning of rectifier modules |  |  | Yes |  |  |  |
| Checking of health of Surge Protection Device (SPD) |  |  | Yes |  |  |  |
| Checking of LVD setting |  |  | Yes |  |  |  |
| Checking of Battery voltage |  |  | Yes |  |  |  |
| Checking & tightness of MCB, Contactors, DCDB, Terminals |  |  |  |  |  | Yes |
| Battery Functional Discharge Test |  |  |  |  |  | Yes |
| Electrical Panel (HT & LT) | Visual inspection of pole mounted transformer / GOD switch,  meter box condition |  |  |  | Yes |  |  |
| Annual Transformer Oil checks |  |  |  |  |  | Yes |
| Readings of energy meter |  |  | Yes |  |  |  |
| Inspection of LT Panel for cleanliness, tightening of connection etc.,  cable alley inspection |  |  |  |  |  | Yes |
| Checking of outgoing feeders |  |  |  | Yes |  |  |
| Checking of Lighting and Power DB. |  |  |  |  |  | Yes |
| Checking, Replacement of bulbs, tube lights |  |  |  | Yes |  |  |
| Earthing system | Checking of connections of earth pits and earth grid. |  |  |  |  |  | Yes |
| Watering of earth pits |  |  | Yes |  |  |  |
| Checking earth resistance value of earth pit |  |  |  |  |  | Yes |
| Lightning protection checking |  |  |  |  |  | Yes |
| Alarm extension to  NOC | Simulation of alarm extension for all Utilities / SAS to NOC / SNOC  and rectification, as required |  |  |  |  |  | Yes |
| Alarm Assurance | Checking of Fuel sensor, Zabbix Connecting cable Intact |  | Yes |  |  |  |  |
| E2E alarm testing (NOC/LSMR/Zabbix/SAS) |  |  | Yes |  |  | Yes |
| Alarm rectification for not communicating E2E |  |  | Yes |  |  |  |
| Fire Alarm System | Fire alarm system simulation |  |  |  | Yes |  |  |
| Annual checking of Fire detection & security alarms |  |  |  |  |  | Yes |
| Miscellaneous | Housekeeping inside Equipment / panel room |  | Yes |  |  |  |  |
| Checking of door locking system / access control |  |  |  | Yes |  |  |
| Security camera functionality test |  |  |  | Yes |  |  |
| Premonsoon checks for cable entries, water seepage, ODU of PACs |  |  |  |  |  | Yes |
| Civil Works | Painting work checking |  |  |  |  |  | Yes |
| Water seepage / leakage checking |  |  |  |  |  | Yes |
| Road, drainage, general civil works etc. checking |  |  |  |  |  | Yes |
| Documentation | Documentation & Report preparation |  | Yes |  |  |  |  |
| Travel | Travel time from MP to AG2 & back |  | Yes |  |  |  |  |
| IP Elements/ Tx Mux/ ILA/ OLT - (AG2  Metro) | Inspect for all Cable Proper Routings, Earthing Cable, Patch cords, SFP Module, Cable/ Patch Cord Connectors, Labelling and Dummy  Plates in unused slots |  |  |  | Yes |  |  |
| Check for LED Status for proper equipment working |  |  | Yes |  |  |  |
| Cleaning or Replacement of Dust Filter/ Air Filter |  |  | Yes |  |  |  |
| Check the Power and Grounding Connectivity using Multimeter |  |  |  | Yes |  |  |
| Check for proper closing of doors |  |  | Yes |  |  |  |
| Cleaning of the Equipment with duster |  |  | Yes |  |  |  |

1. **Activities for Facility Type - Outdoor (Small Cell / Wi-Fi)**

| Facility Type - Outdoor (Small Cell / Wi-Fi) | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Equipment /  Activity Category | Activities Tasks to be Performed | D | W | M | Q | H | Y |
| Travel | Travel to & fro |  |  | Yes |  |  |  |
| Access | Getting access |  |  | Yes |  |  |  |
| Pole/Wall Mount | Opening of Utility Box and Hydra/Ladder erection |  |  | Yes |  |  |  |
| Battery & SMPS | Checking of Battery & SMPS, cleaning of rectifier modules |  |  | Yes |  |  |  |
| Checking of LVD setting |  |  | Yes |  |  |  |
| Checking & tightness of ACDB / DCDB Terminals |  |  |  | Yes |  |  |
| Battery Functional Discharge Test |  |  |  |  | Yes |  |
| Electrical Panel, Energy meter box | Visual inspection of Panel & energy meter box for condition,  cleanliness, tightening of connections, etc. |  |  | Yes |  |  |  |
| Readings of energy meters |  |  | Yes |  |  |  |
| Earthing & Power System | Check Earthing & Power cable termination. |  |  | Yes |  |  |  |
| Checking earth resistance value of earth pit |  |  |  | Yes |  |  |
| Alarm extension  to NOC | Simulation of alarm extension for all Utilities / SAS to NOC / SNOC  and rectification, as required |  |  | Yes |  |  |  |
| Security Alarm System | Checking of security alarms, door locking system / access control |  |  | Yes |  |  |  |
| Miscellaneous | Housekeeping around the Site |  |  | Yes |  |  |  |
| Cable Entry check |  |  | Yes |  |  |  |
| Door Gasket check |  |  | Yes |  |  |  |
| Documentation | Documentation & Report preparation |  |  | Yes |  |  |  |
| Small Cell / L2 Switch / Wi-Fi / UBR | Check Power/CPRI cable and Connector at both ends  (Label/Routing) |  |  |  | Yes |  |  |
| Grounding Checks for UBR, Small Cell and L2 Switch. |  |  | Yes |  |  |  |
| Small Cell/UBR/Wi-Fi AP mounting check |  |  |  | Yes |  |  |
| Small Cell / UBR Antenna Weather proof check |  |  |  | Yes |  |  |
| RF/GPS Antenna check |  |  |  | Yes |  |  |
| Check Antenna Mounts & bolts and Receive Level |  |  | Yes |  |  |  |
| Validate Line Of Sight to Far End Site |  |  | Yes |  |  |  |
| Check UBR Antenna orientation |  |  | Yes |  |  |  |
| Check physical LED status Small Cell, AP, L2 Switch. |  |  | Yes |  |  |  |
| Fan Operational Status of L2 Switch |  |  | Yes |  |  |  |
| Support activities (Node visibility/Liasioning for site access) |  |  | Yes |  |  |  |

1. **Activities for Facility Type - Outdoor (Small Cell / Wi-Fi)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Outdoor Wi-Fi | | | | | | | | |
| Equipment /  Activity Category | Activities / Tasks to be Performed | D | W | F | M | Q | H | Y |
|  | On site support for any Wi-Fi Special events | \*\* | | | | | | |
| Check power availability to Access Point/Switches |  |  |  | Yes |  |  |  |
| Visual Check of LEDs on the Access Point/Switches Cable/Fiber patch cord replacement/Jack In/out / Change SFP Module |  |  |  | Yes |  |  |  |
| Checking the physical connectivity (using ethernet  tester/Optical Power meter) |  |  |  |  | Yes |  |  |
| Wi-Fi Access PoE & Aggregator Switch | Checking of LVD setting |  |  |  | Yes |  |  |  |
| FAN Operational Status |  |  |  | Yes |  |  |  |
| Cable Routing & Labeling |  |  |  |  | Yes |  |  |
| Power Connectivity |  |  |  | Yes |  |  |  |
| Power Supply redundancy |  |  |  |  | Yes |  |  |
| Fibre Optical RX Low power alarm on Switch Gig Port |  |  |  | Yes |  |  |  |

\*\* As and when occurred.

1. **Procedure for FTTx Preventive Maintenance**

|  |  |  |
| --- | --- | --- |
| Sr. No | KPI | Frequency |
| 1 | FAT/S1/S2/OTB PM in periodic frequency | Six Monthly |
| 2 | F&D cable PM ( Including Sag removal and cable redressing ) | Quarterly |
| 3 | PON/S2 High Loss/Degrade Closure | With 3 Days |
| 4 | Route Surveillance | Need Basis |

1. FAT/S1/S2/OTB PM in periodic frequency:
   1. PM shall be done for all ODN for all the FSAs in scope once in six months
   2. Below activities shall be done under this PM activity:
      1. FAT/FDC/OTB Fixing & Tightening
      2. Proper Labelling of Splitters/OTB/FAT Box
      3. F&D Cable Routing correction through Rubber bush
      4. Proper sealing at cable entry and exit point for F&D cables at FDC/FAT/OTB etc
      5. Securing cable loop & Loop clamp at FAT/OTB
      6. Damaged FDC/FAT/OTB box and jubilee clamp replacement
      7. Vegetation clearance on Pole and ODN equipment
      8. FAT Door Working properly and closed
      9. S2/OTB Optical Power measurement (No customer cases), Remove HL if any
   3. Work Orders shall be released to FRT FSA wise with the details of the PM activity to be done monthly
   4. CMP, CHQ and NHQ shall monitor compliance
   5. Reward/penalty shall be calculated based on the compliance at the end of the month
2. F&D cable PM ( Including Sag removal and cable redressing):
   1. PM shall be done for all complete F&D scope for all FSAs once in three months
   2. Below are the activities that shall be done for this PM activity:
      1. OTDR/LSPM of Feeder Dark Fibres, correction of not OK Fiber
      2. SAG Removal & Cable Re-Dressing
      3. JC Rehab
      4. Rerouting/Safe-Guarding
      5. MH/HH Cleaning (Nos)- In case of UG Cable
      6. MH/HH Uplifting/Shifting (Nos)- In case of UG Cable
      7. Proper cable routing for bend radius in MH/HH (No. of MH /HH in feeder section)
      8. Pole Insulation /clearance form EB line/Maintenance of Damaged pole.
      9. Damaged aerial accessories replacement
      10. IBD cabling check in MDU
      11. Checking & replacement of faulty F&D hardware i.e. helix, clamps, thimble, turn buckles etc.

Note: Cable rerouting/Safe-Guarding, MH/HH Shifting or uplifting, JC rehab and SAG removal is not limited to PM only, this is totally need/demand basis.

* 1. Work Orders shall be released to FRT FSA wise with the details of the PM activity to be done monthly
  2. NHQ shall monitor compliance
  3. Reward/penalty shall be calculated based on the compliance at the end of the month

Guidelines for Monthly WO’s Generation:

* PM will be released FSA wise
* If CMP having “X” number of FSA
* No. of FSAs for Six Monthly PM : X/6
* No. of FSAs for Quarterly Monthly PM : X/3
* Six Monthly PM will be done in same FSAs where Quarterly PM is planned.
* WOCL will be done only after 100% completion of all activities in FSA.
* TECO will be done within 7 days of WOCL by FTTx Engineers.
* Compliance calculation will be done based on TECO of WOs
* WOs for the month will be generated First week of the every month.

Guideline for Payment Calculation

* Payment will be calculated CMP wise.
* PM Payment of CMP will be based on %age completion of assigned WOs.
* Work Orders assigned for a particular months shall be completed in that month only
* In case there is any pending WO for the month, same will be carried forward for the next month and added to the total scope of the next month. Payments shall be calculated basis %age completion of Total scope i.e.(BTG WOs of previous month + New WOs for the month)
* If the CMP meets the relaxed Target shared, then it will get complete points for it and in case any CMP is not able to meet the Target set, it will not get any points for the same.

Below is the checklist for PM-1 and PM-2:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Domain | Device codes | Operation short text | Frequency | Photo Requirement | Options for filling |
| FTTx | OLT\_F&D | FDC/FAT/OTB properly fixed and tightened | Half Yearly | Y Note-1 | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | Proper cable looping done within FAT | Half Yearly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | Cable routing through rubber bush/ gland | Half Yearly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | Proper Labelling in place on FAT/S2 | Half Yearly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | FAT Box Door Closed | Half Yearly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | FAT Fixed & Locked Properly working | Half Yearly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | S2 power level within limit (<23.5dBm) | Half Yearly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | Dust Cap available in free ports | Half Yearly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | OTDR of all Dark Fibres done | Quarterly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | All Dark Fibres ok and losses within limit | Quarterly | Y Note-2 | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | F&D Route walk and identification of issues and correction | Quarterly | Y Note-3 | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | Tightening and replacement of damaged/aged aerail accessories | Quarterly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | Verification of Pole extender/Cable Loop condition and correction | Quarterly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | F&D Cable/ODN clearnce form EB line as per Specification | Quarterly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | SAG Removed & Cable Re-Dressing Done | Quarterly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | MH/HH Shifting Done In case of UG Cable | Quarterly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | MH/HH Uplifting Done In case of UG Cable | Quarterly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | MH/HH Cleaning Done In case of UG Cable | Quarterly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | Cable Loop tied Properly on Pole/Wall | Quarterly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |
| FTTx | OLT\_F&D | Own Pole Condition verification and correction | Quarterly |  | OK / Corrected / Not OK - To be corrected / Not Applicable |

Note-1 : Photograph of filled annexure-1 to be attached,

Note-2 : Photograph of filled annexure-3 to be attached. Two separate test reports to be attached for Feeder-1 and Feeder-2

Note-3: Photograph of filled annexure-2 to be attached.

All the Annexures shall be maintained at CMP for the period of 2 years

1. PON/S2 High Loss/Degrade Closure:
   1. PON/S2 High Loss/Degrade TTs will be generated by NOC based on Alarms.
   2. Monthly dump shall be taken from HPSM
   3. Reward/Penalty shall be calculated basis compliance of TT closure within 3 days
2. Route Surveillance:

SP staff shall perform route surveillance on need basis. Monitoring of these route surveillance to be done by respective FTTx Engineer. Route surveillance frequency to be planned by MP based on type of network, criticality, no of cuts, expansion activities or any other local parameter.

The surveillance visit shall be planned based on information received from various sources, security information systems or any other source regarding any threat envisaged to our F&D network.

In such cases, the team shall be mobilized immediately to reach the designated location as informed. The threat envisaged to F&D network mainly because of some activities being carried out in vicinity of the Route/FSA/DSA or exposed OFC.

Detailed investigation by patroller shall be carried out taking into consideration site condition and associated anticipated risk to the network simply by observing activities near a cable route and identifying those that could cause possible damage.

1. **Procedure for Tower Preventive Maintenance**

# Preventive Maintenance Scheduling

* + - The Core Maintenance team shall prepare the Preventive Maintenance Schedule based on the condition of the equipment for the financial year (April to March).
    - For Time-based scheduling, the functional team shall prepare the Equipment Service sheet based on different time cycles.
    - For Performance (Run Based) scheduling the functional team shall prepare the Equipment Service sheet based on usage parameters / run hours.
    - For Condition based scheduling, the operating parameters of the equipment shall be maintained. Any variation / change beyond threshold value will automatically trigger a Maintenance Work Order.
    - The Maintenance system shall generate PM work orders detailing specific tasks to be performed in that time cycle / interval. / Usage parameter or surveillance.
    - Based on the schedule prepared for the equipment’s, the PM order will be automatically triggered from the system.
    - If scheduling period is not entered, the system ensures that at least one waiting release exists.
    - The details for triggering of PM Work Order in the system & the float allowed for its execution shall be as below:

|  |  |  |  |
| --- | --- | --- | --- |
| Sr.  No. | Frequency | Work Order Trigger | Time Period for Execution |
| 1 | Fortnightly | 1st and 15th of month | 15 Day (for GBM & Solar) |
| 2 | Monthly | 1st Day of Month | 30 days |
| 3 | Quarterly | 1st Day of Quarter | 30 Days |
| 4 | Yearly | 1st Day of Year | 365 days |

Note: The preventive maintenance execution shall be carried out through JPW.

# New Equipment Addition

When a new equipment is Phased In the system, the maintenance strategy for same shall be decided by the Core Maintenance team based on the Equipment service sheet, provided by the functional teams. It will be then uploaded in the system based on which automatic PM work order will be triggered.

# Deviation from PM plan

* Some situations may arise requiring deviation from the PM schedule. These can be in the form of early visits to sites based on some alarms, OEM non-availability, site access issues, spare part availability, other systems dependence, etc.
* In such cases, the field team shall prepare a brief note explaining reason for deviation and shall maintain same along with the PM schedule. This note shall be authenticated by the Infra Lead in case the deviation. In such case, CMM approval shall be sought through Email citing the Work Order No. and reason for delay and confirmation that the deviation has not resulted in any untoward harm to the concerned equipment.
* The PM activity shall be carried out at the earliest opportunity and actual date to be recorded in the PM schedule and also on the deviation note.

1. **Check Sheet (Task List):**
   1. **P1 GBM Technician:**

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency  (W) | Photo  Requirement | Options for  filling |
| 15 DAYS PM OF SITE |  |  |  |
| Air-Filter (B-type Filter) cleaning of BBU. | 15D | y | C03 |
| Air Filter cleaning of PAR Router | 15D | y | C02 |
| Monthly PM OF SITE |  |  |  |
| Check New EMF Sign board available | 1M | y | C02 |
| Check Danger Sign available on EB meter and DG Set. | 1M | y | C02 |
| Check Aviation warning lamp is functioning. | 1M | y | C03 |
| Check Lightening arrestor, Earthing is available and measure its resistance value. | 1M | y | C02 |
| Check Battery Comm, Power, Earthing cable Connection & there must be gap between 2 Modules. | 1M |  | C02 |
| Ensure no dust, water droplet on Battery module. Check if BM is over  heated or bulged. | 1M |  | C02 |
| Visibility of BMS communication on SMPS controller. | 1M |  | C02 |
| Check for Tightening of loose connection for Battery and J Box, CBMS,  Busbars. | 1M | y | C02 |
| Check DG connections & sensors in DG canopy, (BB, Capacitor, Solenoid) AMF & Alternator. | 1M | y | C03 |
| Check Full DG de-dusting, No leakages, AMF Connection, No looping, bypassing MCB, Contactor. | 1M |  | C03 |
| Check for DG coolant, fuel, lube oil levels, leakages. Top up the coolant ,  Lube oil level | 1M |  | C03 |
| Check for DG Air system, radiator, belt, fan, Filter, Exhaust, and Simulate & Check all DG alarms. | 1M |  | C03 |
| SEB-DG KWH to be checked, if reqd correct CT Settings, Check correctness SEB, Load KWH value. | 1M |  | C01 |
| Check DG Controller Comm with Zabbix ,Check Parameters of DG,BB visible in SMPS Controller | 1M |  | C03 |
| Chk AC or DC Cables harness are not touching Engine body, any insulation abrasion or damages. | 1M |  | C03 |
| Check DG controller Parameter setting for mains SEB voltage and DC  Battery voltage. | 1M |  | C01 |
| Check and Ensure DG operation mode is selected for 3 phase EB connection settings. | 1M |  | C01 |
| Check DG fuel level sensor communication with DG controller via SMPS to Zabbix. | 1M | y | C01 |
| Check Health of DG Battery. Ensure Electrolyte level & Sp. Gr. of DG  Battery. | 1M | y | C03 |
| Check Super Capacitor Status and its functionality. | 1M |  | C03 |
| Check and Ensure Fuel inlet and return hose is metallic braided. | 1M |  | C03 |
| Check for DG neutral, body, alternator, AMF panel earthing & Neutral to Earth Voltage. | 1M |  | C03 |

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Chk Class B SPD Healthy status, Loose connection also SPD & connection between SPD earths. | 1M | y | C03 |
| Check GBM Door , Filters ,GBM Status , No Gap between GBM Doors | 1M |  | C03 |
| Check operation of both bay ODC cooling fans, Clean ODC door filters, Check ODC Controller. | 1M | y | C03 |
| Check ODC condition for damages, Rust and unused Gland hole sealing, No Gap in ODC Door. | 1M | y | C03 |
| Check sufficient gap between ODC filter & BB terminal bus bar, Check ODC  Filter Status. | 1M |  | C03 |
| Check SEB service connection and ensure no joints, Extension of cable in  cable. | 1M |  | C02 |
| Check for healthiness of SEB meter and its operation visually. | 1M |  | C03 |
| Check for Loose connection, Overheating, termination, looping ,bypassing at Fuse box, MCBs. | 1M | y | C02 |
| Tightening of loose connection at MCB, SPD, and Parts. No Bypass, looping at MCB, AC-DC Terminals. | 1M |  | C02 |
| Chk rectifier working, sharing Load & Remove Rectifier Modules 1 by 1,Clean RM Module. | 1M |  | C02 |
| Chk RMs working & sharing Load. Remove all Modules one by one, de-dust with low pressure blower | 1M | y | C02 |
| Chk Colour coding MDS cable. Open Cable should be shorted; locking door strip rod working. | 1M | y | C02 |
| Clean Cat6 connector & E-SFP, Do proper routing of MDS, Cat6, Power cable & SAS Connections. | 1M |  | C02 |
| Check Voltage at controller, MDS, MDS positioning & Alignment. | 1M | y | C02 |
| Show card, check and confirm lock is opening with Card. | 1M |  | C02 |
| Check door panels alignment status for smooth locking. | 1M |  | C02 |
| Test of SAS Closed circuit video - CCTV (if available). | 1M |  | C03 |
| Ensure testing of SAS, Door lock, Motion detector. | 1M |  | C02 |
| Ensure unused ports & slots in BBU, 5G unit (DU), ESR, PAR covered with Dummy Plates ,Caps. | 1M |  | C02 |
| Power connection 4G/5G units properly terminated with std connector/crimping, No decolouring, signs overheating. | 1M |  | C02 |
| Check earthing connection for 4G/5G units (DU, GPS Arrestor, RRH, CPRI Cables, RU, MMU, GPS, and CPRI). | 1M |  | C02 |
| For RRH, FRH, FRU, 5G RU, MMU ensure ROTEX cable entry is sealed & U shaping of cable before entry. | 1M | y | C02 |
| Visually Inspect, No obstruction in 4G/5G RF antenna/GPS antenna sight, Ensure Cable routing, labelling. | 1M |  | C02 |
| ESR, PAR are grounded, Power Cable properly connected. No signs of overheating, decolouration. | 1M | y | C02 |
| Ensure All ESR, PAR cables are properly routed & labelled. | 1M |  | C02 |
| Check PAR FAN status, Check ESR, PAR device temperature. | 1M |  | C03 |
| Maintain Housekeeping, Dust free 4G/5G DU, Cables. Unused material removal & Vegetation at site. | 1M | y | C03 |
| Hard Copy of Golders Parameter Chis to be filled manually & photo of same to be attached in WO. | 1M | y | C02 |
| Check Earthing value (<1 Ohm), Condition of earth pits, interconnection IGB, EBG, TGB. (photograph of earth value) | 1M | y | C02 |
| Check No Water Droplet, Seepage on CDU, RDU, 5G DU, BH cable, CPRI Cable, CPRI cable, Power Cable, GPS Cable. | 1M |  | C02 |

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Ensure 4G/5G DU, RRH, RU, MMU, GPS, and RF Antenna fixed with clamp- connector and tightened. Should not be fixed with any type of rope, cable  ties | 1M |  | C02 |
| Discharge battery by switching off AC Power for 10 Min (Photo of SMPS controller) | 1M | Y | C02 |
| Monthly PM of Solar Site |  |  |  |
| Wet cleaning of solar panels. Water cleaning.- If Needed | 1M | Y | C03 |
| Visual inspection of power cable termination at MPPT, SMPS, Battery, Earthing. | 1M |  | C03 |
| Connection tightness in Junction box, MC4 Connector tightness. | 1M | Y | C03 |
| Alarm Simulation (Communication fail) | 1M |  | C03 |
| Dry cleaning of solar panels, Visual check for any cracks on panels or Theft. | 1M | Y | C03 |
| Visual check of Solar charge controller modules (Healthiness or  Availability). | 1M | Y | C03 |
| RTU Connection, Working. | 1M |  | C03 |
| Working of MPPT (Input-Output Voltage and Current). | 1M |  | C03 |
| MPPT MCB healthiness | 1M |  | C03 |
| MPPT Qty. configuration in SMPS controller | 1M |  | C03 |
| MPPT Qty. in Rack and in Controller should be same | 1M |  | C03 |
| Adaptive charging software in SMPS to limit DG loading | 1M |  | C03 |
| All Installed Battery modules are healthy and connected. | 1M |  | C03 |
| DG trigger voltage setting should be less than 48.5 V. | 1M |  | C03 |
| DG run time setting should be 90 Minutes. | 1M |  | C03 |
| One Picture of covering all Solar panels from front | 1M | Y | C03 |
| 3 Monthly PM OF SITE |  |  |  |
| Check condition of earth pits, interconnection EP, TGB & TMGB ,TGB support insulator | 3M |  | C02 |
| Ensure for Rectifier Phase assignment by noting the line voltages data on SMPS controller. | 3M |  | C02 |
| Ensure for Rectifiers are placed in different Phase to ensure no single phase loading. | 3M |  | C02 |
| Chk for tower & DG foundation Status and foundation bolts tightness. | 3M | y | C02 |
| Health Check-ups of ladder, fall arrestor, Water ingress, monsoon prevention, water logging. | 3M |  | C03 |
| Checking of ODC smoke detector alarm by actual smoke activation ( Bay- 1,Bay-2, Bay-3) | 3M |  | CO2 |
| Visual check of intactness and continuity of EB transformer neutral | 3M |  | CO2 |
| Check proper rating of MCB and contactor (80/100A for 5G) and condition and connection. | 3M |  | CO2 |
| Checking of DG adaptive charging limit, by discharging and recharging of  battery on DG | 3M |  | C03 |
| Half Yearly /Yearly PM |  |  |  |
| Tightness of Solar structure foundation bolts, Members, Antitheft  hardware. | 6M |  | C03 |
| Open Circuit-Voc-checks of PV modules at Input MPPT.MPPT should be Off. | 6M |  | C03 |
| Tree branch trimming for shadow casting on solar panel. | 6M |  | C03 |
| Repair and Maintenance of earthing system | 12M |  | CO2 |
| Maintenance and Cleaning of GBM (Removal of bird nest from inside, cable dressing inside GBM, Foundation bolt checking, Bird Nest cleaning  (mesh) / installation | 12M |  | C03 |

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Discharge test of battery bank up to LVD operation setting by reducing LVD setting and DG start voltage setting | 12M |  | CO1 |

* 1. **P1 Non GBM Technician:**

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Monthly PM OF SITE |  |  |  |
| Check New EMF Sign board available | 1M | y | C02 |
| Check Danger Sign available on EB meter and DG Set. | 1M | y | C02 |
| Check Aviation warning lamp is functioning. | 1M | y | C03 |
| Check Lightening arrestor, Earthing is available and measure its resistance value. | 1M | y | C02 |
| Air-Filter (B-type Filter) cleaning of BBU. | 1M | y | C03 |
| Air Filter cleaning of PAR Router. | 1M | y | C02 |
| Check Battery Comm, Power, Earthing cable Connection & there must be gap between 2 Modules. | 1M |  | C02 |
| Ensure no dust, water droplet on Battery module. Check if BM is over heated or bulged. | 1M |  | C02 |
| Visibility of BMS communication on SMPS controller. | 1M |  | C02 |
| Check for Tightening of loose connection for Battery and J Box, CBMS, Busbars. | 1M | y | C02 |
| Check DG connections & sensors in DG canopy, (BB, Capacitor, Solenoid) AMF & Alternator. | 1M | y | C03 |
| Chk Full DG de-dusting, No leakages, AMF Connection, No looping, bypassing MCB, Contactor. | 1M |  | C03 |
| Check for DG coolant, fuel, lube oil levels, leakages. Top up the coolant , Lube oil level | 1M |  | C03 |
| Check for DG Air system, radiator, belt, fan, Filter, Exhaust, and Simulate & Check all DG alarms. | 1M |  | C03 |
| SEB-DG KWH to be checked, if reqd correct CT Settings, Chk correctness SEB, Load KWH value. | 1M |  | C03 |
| Check DG Controller Comm with Zabbix ,Check Parameters of DG,BB visible in SMPS Controller | 1M |  | C03 |
| Chk AC or DC Cables harness are not touching Engine body, any insulation abrasion or damages. | 1M |  | C03 |
| Check DG controller Parameter setting for mains SEB voltage and DC Battery voltage. | 1M |  | C01 |
| Check and Ensure DG operation mode is selected for 3 phase EB connection settings. | 1M |  | C01 |
| Check DG fuel level sensor communication with DG controller via SMPS to Zabbix. | 1M | y | C01 |
| Check Health of DG Battery. Ensure Electrolyte level & Sp. Gr. of DG Battery. | 1M | y | C03 |
| Check Super Capacitor Status and its functionality. | 1M |  | C03 |
| Check and Ensure Fuel inlet and return hose is metallic braided. | 1M |  | C03 |
| Check for DG neutral, body, alternator, AMF panel earthing & Neutral to Earth  Voltage. | 1M |  | C03 |

9711056170

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Chk Class B SPD Healthy status, Loose connection also SPD & connection between SPD earths. | 1M | y | C03 |
| Check GBM Door , Filters ,GBM Status , No Gap between GBM Doors | 1M |  | C03 |
| Check operation of both bay ODC cooling fans, Clean ODC door filters, Check ODC Controller. | 1M | y | C03 |
| Check ODC condition for damages, Rust and unused Gland hole sealing, No Gap in ODC Door. | 1M | y | C03 |
| Check sufficient gap between ODC filter & BB terminal bus bar, Check ODC Filter Status. | 1M |  | C03 |
| Check SEB service connection and ensure no joints, Extension of cable in cable. | 1M |  | C02 |
| Check for healthiness of SEB meter and it's operation visually | 1M |  | C03 |
| Check for Loose connection, Overheating, termination, looping or bypassing at Fuse box,MCBs. | 1M | y | C02 |
| Tightening of loose connection at MCB, SPD, and Parts. No Bypass, looping at MCB, AC-DC Terminals. | 1M |  | C02 |
| Chk rectifier working, sharing Load & Remove Rectifier Modules 1 by 1,Clean RM Module. | 1M |  | C02 |
| Chk RMs working & sharing Load. Remove all Modules one by one, de-dust with low pressure blower | 1M | y | C02 |
| Chk Colour coding MDS cable. Open Cable should be shorted; locking door strip rod working. | 1M | y | C02 |
| Clean Cat6 connector & E-SFP, Do proper routing of MDS, Cat6, Power cable & SAS Connections. | 1M |  | C02 |
| Check Voltage at controller, MDS, MDS positioning & Alignment | 1M | y | C02 |
| Show card, check and confirm lock is opening with Card. | 1M |  | C02 |
| Check door panels alignment status for smooth locking. | 1M |  | C02 |
| Test of SAS Closed circuit video - CCTV (if available). | 1M |  | C02 |
| Ensure testing of SAS, Door lock, Motion detector. | 1M |  | C02 |
| Ensure unused ports & slots in BBU, 5G unit (DU), ESR, PAR covered with Dummy Plates ,Caps. | 1M |  | C02 |
| Power connection 4G/5G units properly terminated with std connector/crimping, No decolouring, signs overheating. | 1M |  | C02 |
| Check earthing connection for 4G/5G units (DU, GPS Arrestor, RRH, CPRI Cables, RU, MMU, GPS, and CPRI). | 1M |  | C02 |
| For RRH, FRH, FRU, 5G RU, MMU ensure ROTEX cable entry is sealed & U shaping of cable before entry. | 1M | y | C02 |
| Visually Inspect, No obstruction in 4G/5G RF antenna/GPS antenna sight, Ensure Cable routing, labelling. | 1M |  | C02 |
| ESR, PAR are grounded, Power Cable properly connected. No signs of overheating, decolouration. | 1M | y | C02 |
| Ensure All ESR, PAR cables are properly routed & labelled. | 1M |  | C02 |
| Check PAR FAN status, Check ESR, PAR device temperature. | 1M |  | C03 |
| Maintain Housekeeping, Dust free 4G/5G DU, Cables. Unused material removal & Vegetation at site. | 1M | y | C03 |
| Hard Copy of golden Parameter Chks to be filled manually & photo of same to be attached in WO. | 1M | y | C02 |
| Check Earthing value (<1 Ohm), Condition of earth pits, interconnection IGB, EBG, TGB. (photograph of earth value) | 1M | y | C02 |
| Check No Water Droplet, Seepage on CDU, RDU, 5G DU, BH cable, CPRI Cable, eCPRI cable, Power Cable, GPS Cable. | 1M |  | C02 |

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Ensure 4G/5G DU, RRH, RU, MMU, GPS, RF Antenna fixed with clamp-connector and tightened. Should not be fixed with any type of rope, cable ties | 1M |  | C02 |
| Discharge battery by switching off AC Power for 10 Min (Photo of SMPS controller) | 1M | Y | C02 |
| Simulation of smoke alarm for ODC Bay-1 and check for alarm received at SMPS | 1M |  | C03 |
| Simulation of smoke alarm for ODC Bay-2 and check for alarm received at SMPS | 1M |  | C03 |
| Simulation of smoke alarm for ODC Bay-3 and check for alarm received at SMPS | 1M |  | C03 |
| Monthly PM of Solar Site |  |  |  |
| Wet cleaning of solar panels. Water cleaning.- If Needed | 1M | Y | C03 |
| Visual inspection of power cable termination at MPPT, SMPS, Battery, Earthing. | 1M |  | C03 |
| Connection tightness in Junction box, MC4 Connector tightness. | 1M | Y | C03 |
| Alarm Simulation (Communication fail) | 1M |  | C03 |
| Dry cleaning of solar panels, Visual check for any cracks on panels or Theft. | 1M | Y | C03 |
| Visual check of Solar charge controller modules (Healthiness or Availability). | 1M | Y | C03 |
| RTU Connection, Working. | 1M |  | C03 |
| Working of MPPT (Input-Output Voltage and Current). | 1M |  | C03 |
| MPPT MCB healthiness | 1M |  | C03 |
| MPPT Qty. configuration in SMPS controller | 1M |  | C03 |
| MPPT Qty. in Rack and in Controller should be same | 1M |  | C03 |
| Adaptive charging software in SMPS to limit DG loading | 1M |  | C03 |
| All Installed Battery modules are healthy and connected. | 1M |  | C03 |
| DG trigger voltage setting should be less than 48.5 V. | 1M |  | C03 |
| DG run time setting should be 90 Minutes. | 1M |  | C03 |
| One Picture of covering all Solar panels from front | 1M | Y | C03 |
| 3 Monthly PM OF SITE |  |  |  |
| Check condition of earth pits, interconnection EP, TGB & TMGB, TGB support insulator. | 3M |  | C02 |
| Ensure for Rectifier Phase assignment by noting the line voltages data on SMPS controller. | 3M |  | C02 |
| Ensure for Rectifiers are placed in different Phase to ensure no single phase loading. | 3M |  | C02 |
| Chk for tower & DG foundation Status and foundation bolts tightness. | 3M | y | C02 |
| Health Check-ups of ladder, fall arrestor, Water ingress, monsoon prevention, water logging. | 3M |  | C03 |
| Visual check of intactness and continuity of EB transformer neutral | 3M |  | CO2 |
| Check proper rating of MCB and contactor (80/100A for 5G) and condition and connection. | 3M |  | CO2 |
| Checking of DG adaptive charging limit, by discharging and recharging of battery on DG | 3M |  | CO3 |
| Half Yearly /Yearly PM |  |  |  |
| Tightness of Solar structure foundation bolts, Members, Antitheft hardware. | 6M |  | CO3 |
| Open Circuit-Voc-checks of PV modules at Input MPPT.MPPT should be Off. | 6M |  | CO3 |
| Tree branch trimming for shadow casting on solar panel. | 6M |  | CO3 |
| Repair and Maintenance of earthing system | 12M |  | CO2 |
| Maintenance and Cleaning of GBM (Removal of bird nest from inside, cable dressing inside GBM, Foundation bolt checking, Bird Nest cleaning (mesh) / installation | 12M |  | CO3 |
| Discharge test of battery bank up to LVD operation setting by reducing LVD setting and DG start voltage setting | 12M |  | CO1 |

* 1. **RP1 Non GBM Technician:**

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Monthly PM OF SITE |  |  |  |
| Check New EMF Sign board available | 1M | Y | C02 |
| Check Danger Sign available on EB meter and DG Set. | 1M | Y | C02 |
| Check Aviation warning lamp is functioning. | 1M | Y | C03 |
| Check Lightening arrestor, Earthing is available and measure its resistance value. | 1M | Y | C02 |
| Air-Filter (B-type Filter) cleaning of BBU. | 1M | Y | C03 |
| Air Filter cleaning of PAR Router. | 1M | Y | C02 |
| Check Battery Comm, Power, Earthing cable Connection & there must be gap between 2 Modules. | 1M |  | C02 |
| Ensure no dust, water droplet on Battery module. Check if BM is over heated or bulged. | 1M |  | C02 |
| Visibility of BMS communication on SMPS controller. | 1M |  | C02 |
| Check for Tightening of loose connection for Battery and J Box, CBMS, Busbars. | 1M | Y | C02 |
| Check DG connections & sensors in DG canopy, (BB, Capacitor, Solenoid) AMF & Alternator. | 1M | Y | C03 |
| Chk Full DG de-dusting, No leakages, AMF Connection, No looping, bypassing MCB, Contactor. | 1M |  | C03 |
| Check for DG coolant, fuel, lube oil levels, leakages. Top up the coolant, Lube oil level. | 1M |  | C03 |
| Check for DG Air system, radiator, belt, fan, Filter, Exhaust, and Simulate & Check all DG alarms. | 1M |  | C03 |
| SEB-DG KWH to be checked, if reqd correct CT Settings, Chk correctness SEB, Load KWH value. | 1M |  | CO1 |
| Check DG Controller Comm with Zabbix, Check Parameters of DG, and BB visible in SMPS Controller. | 1M |  | C03 |
| Chk AC or DC Cables harness are not touching Engine body, any insulation abrasion or damages. | 1M |  | C03 |
| Check DG controller Parameter setting for mains SEB voltage and DC Battery voltage. | 1M |  | CO1 |
| Check and Ensure DG operation mode is selected for 3 phase EB connection settings. | 1M |  | CO1 |
| Check DG fuel level sensor communication with DG controller via SMPS to Zabbix. | 1M | Y | CO1 |
| Check Health of DG Battery. Ensure Electrolyte level & Sp. Gr. of DG Battery. | 1M | Y | C03 |
| Check Super Capacitor Status and its functionality. | 1M | Y | C03 |
| Check and Ensure Fuel inlet and return hose is metallic braided. | 1M |  | C03 |
| Check for DG neutral, body, alternator, AMF panel earthing & Neutral to Earth Voltage. | 1M |  | C03 |

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Chk Class SPD Healthy status,Loose connection also SPD & connection between SPD earths. | 1M | Y | C03 |
| Check GBM Door , Filters ,GBM Status , No Gap between GBM Doors. | 1M |  | C03 |
| Check operation of both bay ODC cooling fans ,Clean ODC door filters, Check ODC Controller. | 1M |  | C03 |
| Check ODC condition for damages, Rust and unused Gland hole sealing ,No Gap in ODC Door. | 1M | Y | C03 |
| Check sufficient gap between ODC filter & BB terminal bus bar, Check ODC Filter Status. | 1M |  | C03 |
| Check SEB service connection and ensure no joints , Extension of cable in cable. | 1M |  | C02 |
| Check for healthiness of SEB meter and it's operation visually | 1M |  | C03 |
| Check for healthiness of SEB meter,Loose connection, Overheating, termination, looping or bypassing at Fuse box,MCBs. | 1M | Y | C03 |
| Tightening of loose connection at MCB,SPD,Parts. No Bypass, looping at MCB,AC-DC Terminals. | 1M |  | C02 |
| Chk rectifier working, sharing Load & Remove Rectifier Modules 1 by 1,Clean RM Module. | 1M |  | C02 |
| Chk RMs working & sharing Load. Remove all Modules one by one, de-dust with low pressure blower | 1M | Y | C02 |
| Chk Colour coding MDS cable. Open Cable should be shorted; locking door strip rod working. | 1M | Y | C03 |
| Clean Cat6 connector & E-SFP, Do proper routing of MDS, Cat6, Power cable & SAS Connections. | 1M |  | C03 |
| Check Voltage at controller, MDS, MDS positioning & Alignment | 1M | Y | C03 |
| Show card, check and confirm lock is opening with Card. | 1M |  | C03 |
| Check door panels alignment status for smooth locking. | 1M |  | C03 |
| Test of SAS Closed circuit video - CCTV (if available). | 1M |  | C03 |
| Ensure testing of SAS,Door lock, Motion detector. | 1M |  | C03 |
| Check for DG neutral, body ,alternator,AMF panel earthing & Neutral to Earth Voltage. | 1M |  | C03 |
| Check for Loose connection, Overheating, poor termination at Fuse box,MCBs . | 1M | Y | C02 |
| Check any RCOM Shelter Leakage , Shelter Faults , Shelter related issues any . | 1M | Y | C02 |
| Check ETSI Rack Status for Indoor Sites , Grouting , Structure Stability | 1M | Y | C03 |
| Check for Loose connection Tightening & earthing contact for all eqpt. | 1M |  | C02 |
| Ensure unused ports & slots in BBU, 5G unit (DU), ESR, PAR covered with Dummy Plates ,Caps. | 1M |  | C02 |
| Power connection 4G/5G units properly terminated with std connector/crimping, No decolouring, signs overheating. | 1M |  | C02 |
| Check earthing connection for 4G/5G units (DU, GPS Arrestor, RRH, CPRI Cables,RU, MMU, GPS, eCPRI). | 1M |  | C02 |
| For RRH,FRH,FRU,5G RU,MMU ensure ROTEX cable entry is sealed & U shaping of cable before entry. | 1M | y | C02 |
| Visually Inspect, No obstruction in 4G/5G RF antenna/GPS antenna sight, Ensure Cable routing ,labelling. | 1M |  | C02 |
| ESR,PAR are grounded ,Power Cable properly connected. No signs of overheating, decolouration. | 1M | y | C02 |
| Ensure All ESR , PAR cables are properly routed & labelled. | 1M |  | C02 |
| Check PAR FAN status ,Check ESR,PAR device temperature. | 1M |  | C03 |
| Maintain Housekeeping , Dust free 4G/5G DU, Cables. Unused material removal & Vegetation at site. | 1M | y | C03 |

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Hard Copy of golden Parameter Chks to be filled manually & photo of same to be attached in WO. | 1M | y | C02 |
| Check Earthing value (<1 Ohm), Condition of earth pits, interconnection IGB, EBG, TGB. (photograph of earth value) | 1M | y | C02 |
| Check No Water Droplet, Seepage on CDU, RDU, 5G DU, BH cable, CPRI Cable, eCPRI cable, Power Cable, GPS Cable. | 1M |  | C02 |
| Ensure 4G/5G DU, RRH, RU, MMU, GPS, RF Antenna fixed with clamp-connector and tightened. Should not be fixed with any type of rope,cable ties | 1M |  | C02 |
| Discharge battery by switching off AC Power for 10 Min (Photo of SMPS controller) | 1M | Y | C02 |
| Simulation of smoke alarm for ODC Bay-1 and check for alarm received at SMPS | 1M |  | C03 |
| Simulation of smoke alarm for ODC Bay-2 and check for alarm received at SMPS | 1M |  | C03 |
| Simulation of smoke alarm for ODC Bay-3 and check for alarm received at SMPS | 1M |  | C03 |
| Shelter & PAC Monthly PM |  |  |  |
| Check PAC Cooling | 1M |  | C03 |
| Check FCU Operational | 1M |  | C03 |
| PAC -Check for Set Point as per guideline | 1M |  | C03 |
| Check PAC Filter cleaning | 1M | Y | C03 |
| Cleaning of ODU | 1M | Y | C03 |
| Sunlight test of Shelter (In dark shelter, sun light should not be visible) | 1M |  | C03 |
| Proper sealing of Roxtec | 1M | Y | C03 |
| Proper fixing of EGB & IGB along with connectivity | 1M |  | C03 |
| Check Door alignment | 1M |  | C03 |
| Check Door locking | 1M |  | C03 |
| 3 Monthly PM OF SITE |  |  |  |
| Ensure for Rectifier Phase assignment by noting the line voltages data on SMPS controller. | 3M |  | C02 |
| Chk for tower & DG foundation Status and foundation bolts tightness. | 3M | Y | C02 |
| Check condition of earth pits, interconnection EP, TGB & TMGB ,TGB support insulator | 3M |  | C02 |
| Health Check-ups of ladder, fall arrestor, Water ingress, monsoon prevention, water logging | 3M |  | C03 |
| Structure Health Checks of Foundation, Platform, Anti corrosive painting, Structure, Bolts. | 3M | Y | C02 |
| Checking of ODC smoke detector alarm by actual smoke activation ( Bay-1, Bay-2, Bay-3) | 3M |  | C02 |
| Visual check of intactness and continuity of EB transformer neutral | 3M |  | C02 |
| Check proper rating of MCB and contactor (80/100A for 5G) and condition and connection. | 3M |  | C02 |
| Checking of DG adaptive charging limit, by discharging and recharging of battery on DG | 3M |  | CO3 |
| Half Yearly /Yearly PM |  |  |  |
| Tightness of Solar structure foundation bolts, Members, Antitheft hardware. | 6M |  | CO3 |
| Open Circuit-Voc-checks of PV modules at Input MPPT.MPPT should be Off. | 6M |  | CO3 |
| Tree branch trimming for shadow casting on solar panel. | 6M |  | CO3 |
| Repair and Maintenance of earthing system | 12M |  | C02 |
| Maintenance and Cleaning of GBM (Removal of bird nest from inside, cable dressing inside GBM, Foundation bolt checking, Bird Nest cleaning (mesh) / installation | 12M |  | CO3 |
| Discharge test of battery bank up to LVD operation setting by reducing LVD setting and DG start voltage setting | 12M |  | CO1 |

* 1. **IPCOLO Non GBM Technician:**

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Monthly PM OF SITE |  |  |  |
| Check New EMF Sign board available | 1M | y | C02 |
| Air-Filter (B-type Filter) cleaning of BBU. | 1M | y | C03 |
| Air Filter cleaning of PAR Router. | 1M | y | C02 |
| Check operation of all ODC cooling fans, Clean ODC door filters, Check ODC Controller & ODC. | 1M |  | C02 |
| Check ODC condition for damages, Rust & unused Gland sealing, No Gap between  ODC Door. | 1M | y | C02 |
| Check sufficient gap between filter and Battery terminal bus bar, Check ODC Filter Status. | 1M | y | C02 |
| Check Colour coding MDS cable. Open Cable should be shorted; locking door strip rod working. | 1M | y | C03 |
| Clean Cat6 connector & E-SFP, Proper routing of MDS, Cat6, and Power cable. | 1M |  | C03 |
| Check Voltage at controller, MDS; MDS positioning & Alignment. | 1M | y | C03 |
| Show card, check and confirm lock is opening with Card. | 1M |  | C03 |
| Check door panels alignment status for smooth locking. | 1M | y | C03 |
| Test of SAS Closed circuit video - CCTV (if available). | 1M |  | C03 |
| Ensure testing of SAS,Door lock, Motion detector | 1M |  | C03 |
| Check SEB Meter, SEB service connection, ensure no joints, Extension of cable (Visual). | 1M |  | C02 |
| Check for healthiness of SEB meter and its operation visually (Visual Checks). | 1M |  | C02 |
| Check for Loose connection, Overheating, termination, looping OR bypassing at Fuse box,MCBs. | 1M | y | C02 |
| Check any Shelter Leakage , Shelter Faults , Shelter related issues any (Visual Checks) | 1M | y | C03 |
| Check for Loose connection Tightening & earthing contact for all eqpt. (Visual  Checks). | 1M | y | C03 |
| Check Status of RJIL VRLA BB OR Li-Ion BB and Its Functioning, Any Fault to Close. | 1M | y | C03 |
| Check Status of RJIL DG and Its Functioning, Any Fault, Alarm to Close. | 1M | y | C03 |
| Check ETSI Rack Status for Indoor Sites, Grouting, Structure Stability (Indoor Site). | 1M | y | C03 |
| Check Status of RJIL SMPS and Its Functioning, Any Fault, Alarm to Close. | 1M | y | C03 |
| Ensure unused ports & slots in BBU, 5G unit (DU), ESR, PAR covered with Dummy  Plates ,Caps. | 1M |  | C02 |
| Power connection 4G/5G units properly terminated with stud connector/crimping, No decolouring, signs overheating. | 1M |  | C02 |
| Check earthing connection for 4G/5G units (DU, GPS Arrestor, RRH, CPRI Cables, RU, MMU, GPS, eCPRI). | 1M |  | C02 |
| For RRH,FRH, FRU, 5G RU, MMU ensure ROTEX cable entry is sealed & U shaping of  cable before entry. | 1M | y | C02 |

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Visually Inspect, No obstruction in 4G/5G RF antenna/GPS antenna sight, Ensure Cable routing ,labelling. | 1M |  | C02 |
| ESR,PAR are grounded ,Power Cable properly connected. No signs of overheating,  decolouration. | 1M | y | C02 |
| Ensure All ESR, PAR cables are properly routed & labelled. | 1M |  | C02 |
| Check PAR FAN status, Check ESR,PAR device temperature. | 1M |  | C03 |
| Maintain Housekeeping, Dust free 4G/5G DU, Cables. Unused material removal & Vegetation at site. | 1M | y | C03 |
| Check Earthing value (<1 Ohm), Condition of earth pits, interconnection IGB, EBG,  TGB. (photograph of earth value) | 1M | y | C02 |
| Check No Water Droplet, Seepage on CDU, RDU, 5G DU, BH cable, CPRI Cable, eCPRI cable, Power Cable, GPS Cable. | 1M |  | C02 |
| Ensure 4G/5G DU, RRH, RU, MMU, GPS, RF Antenna fixed with clamp-connector and tightened. Should not be fixed with any type of rope, cable ties | 1M |  | C02 |
| 3 Monthly PM OF SITE |  |  |  |
| Check condition of earth pits, EP, TGB & TMGB, TGB support insulator (Visual Checks). | 3M |  | C03 |
| Check for tower & DG foundation Status and foundation bolts tightness. | 3M | y | C03 |
| Checking of ODC smoke detector alarm by actual smoke activation ( Bay-1,Bay-2, Bay-3) | 3M |  | CO2 |
| Visual check of intactness and continuity of EB transformer neutral | 3M |  | CO2 |
| Check proper rating of MCB and contactor (80/100A for 5G) and condition and  connection. | 3M |  | CO2 |
| Checking of DG adaptive charging limit, by discharging and recharging of battery on DG | 3M |  | CO3 |
| Half Yearly /Yearly PM |  |  |  |
| Tightness of Solar structure foundation bolts, Members, Antitheft hardware. | 6M |  | CO3 |
| Open Circuit-Voc-checks of PV modules at Input MPPT.MPPT should be Off. | 6M |  | CO3 |
| Tree branch trimming for shadow casting on solar panel. | 6M |  | CO3 |
| Repair and Maintenance of earthing system | 12M |  | CO2 |
| Maintenance and Cleaning of GBM (Removal of bird nest from inside, cable dressing inside GBM, Foundation bolt checking, Bird Nest cleaning (mesh) / installation | 12M |  | CO3 |
| Discharge test of battery bank up to LVD operation setting by reducing LVD setting  and DG start voltage setting | 12M |  | CO1 |

* 1. **ESC Non GBM Technician:**

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Monthly PM OF SITE |  |  |  |
| Air-Filter (B-type Filter) cleaning of BBU | 1M | Y | C03 |
| Check New EMF Sign board available | 1M | Y | C02 |
| Check Danger Sign available on EB meter and DG Set. | 1M | Y | C02 |
| Check Aviation warning lamp is functioning. | 1M | Y | C03 |
| Check Lightening arrestor, Earthing is available and measure its resistance value. | 1M | Y | C02 |
| Check Battery Comma, Power, Earthing cable Connection & there must be gap between 2 Modules. | 1M |  | C02 |
| Ensure no dust, water droplet on Battery module. Check if BB is over heated or bulged. | 1M |  | C02 |
| Ensure Node ID for Battery Modules & Visibility of BMS communication on SMPS  controller. | 1M |  | C02 |
| Check for Tightening of loose connection for Battery and J Box, CBMS , Bus bars | 1M | Y | C02 |
| Check DG connections & sensors in DG canopy, (BB, Capacitor, Solenoid) AMF & Alternator. | 1M | Y | C03 |
| Check Full DG de-dusting, No leakages, AMF Connection, No looping, bypassing  MCB, Contactor. | 1M |  | C03 |
| Check for DG coolant, fuel, lube oil levels, leakages. Top up the coolant, Lube oil level. | 1M |  | C03 |
| Check for DG Air system, radiator, belt, fan, Filter, Exhaust, and Simulate & Check all DG alarms. | 1M |  | C03 |
| SEB-DG KWH to be checked, if red correct CT Settings, Check correctness SEB,  Load KWH value. | 1M |  | C03 |
| Check DG Controller Comm with Zabbix ,Check Parameters of DG,BB visible in SMPS Controller. | 1M |  | C03 |
| Chk AC or DC Cables harness are not touching Engine body, any insulation  abrasion or damages. | 1M |  | C03 |
| Check DG controller Parameter setting for mains SEB voltage and DC Battery voltage. | 1M |  | C03 |
| Check and Ensure DG operation mode is selected for 3 phase EB connection settings. | 1M |  | C03 |
| Check DG fuel level sensor communication with DG controller via SMPS to  Zabbix. | 1M | Y | C03 |
| Check Health of DG Battery. Ensure Electrolyte level & Sp. Gr. of DG Battery. | 1M | Y | C03 |
| Check Super Capacitor Status and its functionality. | 1M |  | C02 |
| Check and Ensure Fuel inlet and return hose is metallic braided. | 1M |  | C03 |
| Check for DG neutral, body ,alternator,AMF panel earthing & Neutral to Earth Voltage. | 1M |  | C03 |

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Check Loose Conns ,Correction,Tightening of Earthing contact for Eqt,Elect,Earthing Conns. | 1M |  | C03 |
| Chk ClassB SPD Healthy status,Loose connection also SPD & connection  between SPD earths. | 1M | Y | C03 |
| Check GBM Door, Filters ,GBM Status , No Gap between GBM Doors. | 1M |  | C03 |
| Check operation of both bay ODC cooling fans ,Clean ODC door filters, Check ODC Controller. | 1M | Y | C03 |
| Check ODC condition for damages, Rust and unused Gland hole sealing ,No Gap  in ODC Door. | 1M | Y | C03 |
| Check sufficient gap between ODC filter & BB terminal bus bar, Check ODC Filter Status. | 1M |  | C03 |
| Check SEB service connection and ensure no joints , Extension of cable in cable. | 1M |  | C02 |
| Check for healthiness of SEB meter and it's operation visually | 1M |  | C03 |
| Check for Loose connection, Overheating, termination, looping or bypassing at  Fuse box,MCBs. | 1M | Y | C02 |
| Tightening of loose connection at MCB,SPD,Parts. No Bypass, looping at MCB,AC-DC Terminals. | 1M |  | C02 |
| Chk rectifier working, sharing Load & Remove Rectifier Modules 1 by 1,Clean RM Module. | 1M |  | C02 |
| Chk RMs working & sharing Load. Remove all Modules one by one, de-dust with  low pressure blower | 1M | Y | C02 |
| Chk Colour coding MDS cable. Open Cable should be shorted; locking door strip rod working. | 1M | Y | C02 |
| Clean Cat6 connector & E-SFP, Do proper routing of MDS, Cat6, Power cable & SAS Connections. | 1M |  | C02 |
| Check Voltage at controller, MDS, MDS positioning & Alignment | 1M | Y | C02 |
| Show card, check and confirm lock is opening with Card. | 1M |  | C02 |
| Check door panels alignment status for smooth locking. | 1M |  | C02 |
| Test of SAS Closed circuit video - CCTV (if available). | 1M |  | C03 |
| Ensure testing of SAS,Door lock, Motion detector. | 1M |  | C02 |
| Chk earthing connection for DU,GPS Arrestor, RRH, CPRI, HPODSC. | 1M |  | C02 |
| Ensure unused ports & slots in BBU,ESR, PAR, HPODSC covered with Dummy Plates , Caps, Nobs. | 1M |  | C02 |
| Ensure no unused material is lying at site | 1M |  | C02 |
| Visually Inspect for no obstruction in RF & GPS antenna sight | 1M |  | C02 |
| For RRH, FRH, FRU ensure ROTEX cable entry is sealed and U shaping of cable before entry. | 1M | Y | C02 |
| Ensure All ESS cables are properly routed & labelled | 1M |  | C02 |
| Ensure all ESS are grounded & power cable properly connected | 1M | Y | C02 |
| Ensure ODC door fits properly & fan functioning | 1M |  | C02 |
| Hard Copy of golden Parameter Checks to be filled manually & photo of same to  be attached in WO. | 1M | Y | C02 |
| Discharge battery by switching off AC Power for 10 Min (Photo of SMPS controller) | 1M | Y | C02 |
| Simulation of smoke alarm for ODC Bay-1 and check for alarm received at SMPS | 1M |  | C03 |
| Simulation of smoke alarm for ODC Bay-2 and check for alarm received at SMPS | 1M |  | C03 |
| Simulation of smoke alarm for ODC Bay-3 and check for alarm received at SMPS | 1M |  | C03 |
| 3 Monthly PM OF SITE |  |  |  |
| Check condition of earth pits, interconnection EP, TGB & TMGB, TGB support insulator. | 3M |  | C02 |
| Ensure for Rectifier Phase assignment by noting the line voltages data on SMPS controller. | 3M |  | C02 |

|  |  |  |  |
| --- | --- | --- | --- |
| Operation short text | Frequency (W) | Photo Requirement | Options for filling |
| Ensure for Rectifiers are placed in different Phase to ensure no single phase loading. | 3M |  | C02 |
| Check for tower & DG foundation Status and foundation bolts tightness. | 3M | Y | C03 |
| Health Check-ups of ladder, fall arrestor, Water ingress, monsoon prevention,  water logging. | 3M |  | C03 |

1. **Corrective Activities to be performed for various equipment**

|  |  |
| --- | --- |
| **Equipment / Activity**  **Category** | **Activities / Tasks to be performed - Corrective** |
| RAN/ CSS/ MW/UBR | HW Hard Reset & Replacement (gNodeB, UAMA, L9CA, LMD1, LCC2, GPS arrestor ,  Surge Arrestor Replacement, CSS Router & L2 Switch, DU Shelf , FAN , Filter & SFP) |
| RAN/ CSS/ MW/UBR | HW Reset & Replacement (5G NR, RRH, ODU, IDU , MDU, OMT, POE ,UBR Radio,  RET , SFP, RF Antenna, GPS Antenna,MW Antenna) |
| RAN/ CSS/ MW/UBR | MW & UBR Antenna alignment , XPIC Alignment, LOS Check, Antenna Height change |
| RAN/ CSS/ MW/UBR | Support Activities (Node visibility / Local Login),Hard loop break activity,diagnosis,  configuration, Reparenting , 2nd support rod installation |
| RAN/ CSS/ MW/UBR | Checking of LVD setting |
| RAN/ CSS/ MW/UBR | Cable Change / Replacement / Connectrisation - RAN, CSS & MW, Backhaul Cable, eCPRI, CPRI Cable , GPS Cable ,RET Cable,AISGCable ,Y cable, MW IF Cable, Login  Cable, Power Cable, patch cord , Jumper cable including Weather proofing. |
| RAN/ CSS/ MW/UBR | Optical Power measurement, DC Power measurement at Radio end. |
| RAN/ CSS/ MW/UBR | Handling of Tools & TMI like Ethernet / VSWR Tester & LSPM |
| RAN/ CSS/ MW/UBR | Support RF optimization / Antenna tilt / azimuth changes |
| RAN/ CSS/ MW/UBR | Spare Parts arrangement/Return |
| DG | DG Fail to Start / Common fault |
| OSP / ISP | Spare Parts arrangement/Return |
| Battery & SMPS | Battery fuse Fail / SMPS Rectifier Fail |
| Small Cell | Patch Cord/CPRI cable replacement |
| Small Cell | Power cable Replacement |
| Small Cell | Check the physical connections of GPS antenna |
| Small Cell | Improve location of GPS antenna for better sky view |
| Small Cell | Replace GPS antenna |
| Small Cell | Check the physical connections of GPS antenna and cable |
| Small Cell | Reboot the base station |
| Small Cell | Small Cell Unit Replacement |
| Small Cell | Login for Configuration and NOC Visibility |
| Wi-Fi | Visual check of LEDs on the equipment. |
| Wi-Fi | Checking the power availability to switches/access Points. |
| Wi-Fi | Check physical connectivity (using LAN tester/Optical Power Meter) |
| Wi-Fi | Check OFC/Fiber related issues |
| Wi-Fi | Physical replacement of switches and replacement of Access Points onto Ceiling and  Poles |
| Wi-Fi | Replacement of faulty cables with proper routing. |
| Wi-Fi | Console login into access point for trouble shooting and OS upgrade |
| Wi-Fi | Optimization Activity of Wi-Fi RF Network |
| UBR | Patch Cord/CPRI cable replacement |
| UBR | Antenna Alignment and LOS clearance |
| UBR | Login for Configuration |
| UBR | Radio Replacement |
| UBR | Check Power availability and Connectivity |
| UBR | Replacement of faulty cables with proper routing. |
| L2 Switch | Login, Configuration and NOC Visibility |
| L2 Switch | Hardware Replacement |
| L2 Switch | Check Power availability and Connectivity |
| L2 Switch | Patch Cord/CPRI cable replacement |

Any other activity not listed above (corrective/preventive) and necessary for health of the Network incl 4G and 5G equipment will be communicated time to time.

1. **DG Maintenance**

|  |  |
| --- | --- |
| Sr. No | Activities |
| 1 | Simulate all alarms and confirm with NOC |
| 2 | Check connections and sensors |
| 3 | Check DG AMF function |
| 4 | Check air system, LO, FO Filters |
| 5 | Checking of LVD setting |
| 6 | Check coolant level, leakages |
| 7 | Check radiator, belt, fan etc. |
| 8 | Check cooling tower and its auxiliaries |
| 9 | Check fuel level, leakages |
| 10 | Check Exhaust system |
| 11 | Check DG battery & connections |
| 12 | Check alternator, AMF panel and earthing |
| 13 | Record all operational parameters |
| 14 | Lube oil Top up (LO in RJIL scope) |
| 15 | Diesel Filling & Supervision |

1. **PAC / EFC Maintenance**

|  |  |
| --- | --- |
| Sr. No | Activities |
| 1 | Take trial of standby PAC and record operational parameters |
| 2 | Check and clean filters, coil |
| 3 | Check blower rotation and no dust deposit on blades |
| 4 | Check rotation of the condenser fan and no deposit on blades |
| 5 | Check Refrigerant lines for leakages, painting & support |
| 6 | Check the indication in the sight glass for refrigerant moisture |
| 7 | Check Sealing of the gap around the unit. |
| 8 | Ensure no active alarm present |
| 9 | Check Evaporator and Condenser coil condition |
| 10 | Check the Drain Pipe. Clean if required. |
| 11 | Check insulation of water piping in case of CHW units |
| 12 | Check Power and Control Cable and earthing connections |
| 13 | Simulate alarms and interlocks for functionality |
| 14 | Check the Condenser fan motor and compressor for undue |
| 15 | Record operational parameters of running PAC/EFC |

1. **SMPS Maintenance**

| Sr. No | Activities |
| --- | --- |
| 1 | Checking and cleaning of Rectifier Fan tray and its ventilation path |
| 2 | Check Surge Protection Device (SPD) - OK/ Not OK |
| 3 | Clear/check alarm with NOC |
| 4 | Check All rectifier working & sharing Load |
| 5 | Check Software Version of SMPS Controller |
| 6 | Recording of all operational parameters |
| 7 | Check No. of Batteries configured in SMPS |
| 8 | Check All Batteries communication & SOC / SOH |
| 9 | LVD/BLVD setting check |
| 10 | Check Zabbix Integration Done (OK / Not OK) |
| 11 | Check All Parameters visible on Zabbix - DG/Batt |
| 12 | Check Load on Battery (OK / Not OK) |
| 13 | Check DG Start/Stop as per AMF function |
| 14 | Simulate & NOC Confirm: Fire/Smoke Alarm |
| 15 | Hardware Replacement - Rectifier, Controller, Communication |
| 16 | Handing over the defective hardware to MP |

1. **SMPS L1 & L2 Support**

| Sr. No | Problem description | L1 support | L2 Support (site visit) | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Delta | Vertiv/Emerson | Exicom | VNT | Lineage/GE |
| 1 | Controller Faulty / replacement | On call with OEM | Yes | Yes | Yes | Yes | Yes |
| 2 | LVD Faulty | On call with OEM | Yes | Yes | Yes | Yes | Yes |
| 3 | Communication Fail between SMPS to Battery | TRT -> Engineer | No | No | No | No | No |
| 4 | Communication fail between Rectifier to controller | TRT -> Engineer | No | No | No | No | No |
| 5 | MCB Faulty | TRT | No | No | No | No | No |
| 6 | SPD faulty | TRT | No | No | No | No | No |
| 7 | Contactor Faulty | TRT | No | No | No | No | No |
| 8 | Rectifier Faulty | TRT | No | No | No | No | No |
| 9 | Wiring Harness Faulty | On call with OEM | Yes | Yes | Yes | Yes | Yes |
| 10 | Back plain Faulty | On call with OEM | Yes | Yes | Yes | Yes | Yes |
| 11 | DCIO Card faulty | TRT | NA | NA | No | NA | NA |
| 12 | Pushpak replacement | TRT | No | NA | NA | NA | NA |
| 13 | Software upgrade controller | TRT->Engineer->NOC | No | No | No | No | No |
| 14 | Pushpak Software upgrade | TRT->Engineer->NOC | No | No | No | No | No |
| 15 | Installation of SMPS | Contractor | No | No | No | No | No |
| 16 | SO7 / Alarm integration | TRT | No | No | No | No | No |
| 17 | Supply of spares | Jio | No | No | No | No | No |
| 18 | Battery Visibility | On call with OEM | No | No | No | No | No |

**Battery Maintenance**

|  |  |
| --- | --- |
| **Sr. No** | **Activities** |
| 1 | Check for no water ingress/leakage in battery module. |
| 2 | Check battery module for abnormal temperature |
| 3 | Check Present status of Battery Alarm LED |
| 4 | Check Mode of operation (Float/Charge/Discharge) |
| 5 | Check Battery Voltage/SOC/Temperature |
| 6 | Check battery comm./power/earthing cable connection. |
| 7 | Check Power Terminal shrouding |
| 8 | Fuse replacement |
| 9 | Battery Discharge test |
| 10 | Battery Collection & Movement & Replacement |
| 11 | Check Make & No. of Batteries on Site. All batteries should be of the  same make. |

1. **Battery L1 & L2 Support**

| **Sr. No.** | **Problem description** | **L1 Support** | **L2 Support (site visit)** | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Coslight** | **Vision** | **Exicom** | **Panasonic** | **Saft** |
| 1 | Battery Discharge test | TRT-> Engineer | No | No | No | No | No |
| 2 | Preventive maintenance | TRT-> Engineer | No | No | No | No | No |
| 3 | Communication fail between SMPS and Battery | TRT-> Engineer | No | No | No | No | No |
| 4 | Addressing of battery module | TRT-> Engineer | No | No | No | No | No |
| 5 | Communication Cable Faulty | TRT-> Engineer | No | No | No | No | No |
| 6 | Battery configuration > 4Nos | On call with OEM | NA | NA | NA | NA | Yes |
| 7 | CBMS software change | -- | NA | NA | Yes | NA | NA |
| 8 | Visibility | On call with OEM | No | No | No | No | No |
| 9 | Low SOH | TRT-> Engineer | No | No | No | No | No |
| 10 | Low backup | TRT-> Engineer | No | No | No | No | No |
| 11 | Replacement of faulty BMS | On call with OEM | Yes | Yes | Yes | NA | NA |
| 12 | Power board replacement | On call with OEM | NA | NA | NA | NA | Yes |
| 13 | Busbar replacement | On call with OEM | NA | NA | NA | NA | No |
| 14 | Fuse replacement | TRT-> Engineer | NA | NA | NA | No | No |
| 15 | Battery / cell bulged | TRT-> Engineer | No | No | No | No | No |
| 16 | Cell leaking | TRT-> Engineer | No | No | No | No | No |
| 17 | Cell under voltage | TRT-> Engineer | No | No | No | No | No |
| 18 | Deep Discharged | TRT-> Engineer | No | No | No | No | No |
| 19 | Water Ingress | TRT-> Engineer | No | No | No | No | No |
| 20 | Burnt | TRT-> Engineer | No | No | No | No | No |
| 21 | MCB Faulty | TRT-> Engineer | No | No | No | No | No |
| 22 | WCBMS Card faulty | TRT-> Engineer | NA | NA | No | NA | NA |
| 23 | CBMS Controller Faulty | TRT-> Engineer | NA | NA | No | NA | NA |
| 24 | Low SOC | TRT-> Engineer | No | No | No | No | No |
| 25 | High Temperature | On call with OEM | Yes | Yes | Yes | Yes | Yes |
| 26 | Battery Damaged | TRT-> Engineer | No | No | No | No | No |

**G) ODC Maintenance**

|  |  |
| --- | --- |
| **Sr. No** | **Activities** |
| 1 | ODC condition check for rusting, damage if any |
| 2 | Check Door closing & lock condition |
| 3 | Check SAS Lock status |
| 4 | Check sealing and Cable roxtec condition |
| 5 | Check Rubber gasket & Groomet |
| 6 | Check for any leakages. |
| 7 | Filter Cleaning |
| 8 | Check Noise Level of fan |
| 9 | Check Fan condition |
| 10 | ODC Cleaning |
| 11 | Housekeeping nearby ODC |
| 12 | Emergency / EMF Signages check - intact, in place |
| 13 | Smoke detector testing |
| 14 | Scrubbing and application of primer & paint at places on ODC / Canopy outer surfaces where paint is peeled off using Can Spray Paint (FIM). |

1. **Earthing Maintenance**

|  |  |
| --- | --- |
| Sr. No | Activities |
| 1 | Check availability of earth pits/earth electrode at EB DP structure |
| 2 | Check earthing of DP structure, fencing, Transformer body and lightening arrestors at equipment /  earth pit ends |
| 3 | Check Transformer Neutral earthing at Transformer and earth pit ends |
| 4 | Check proper connection at earth electrode bolted joints |
| 5 | Record Voltage between Neutral & Earth |
| 6 | Check earthing bonding at all points |
| 7 | Check DG neutral earthing. |
| 8 | Check earth connections of ODC, cable racks |
| 9 | Check interconnection all EP, TGB & TMGB |
| 10 | Check and clean the TMGB & TGB support insulator |
| 11 | Check connection between SPD and earth flat. |
| 12 | Check earthing between +ve bus & TGB. |
| 13 | Check the earthing of LT panel, ACDB |
| 14 | Check riveted, bolted joints earthing |
| 15 | Fasteners to be opened and Earth Strips joints cleaned |
| 16 | Check condition of earth pits. |
| 17 | Record grid earth resistance. |
| 18 | Earth pit resistance measurement and record |

1. **Tower Maintenance**

|  |  |
| --- | --- |
| Sr. No | Activities |
| 1 | Bolt Tightness check |
| 2 | Foundation intact / Foundation bolt check |
| 3 | Aviation lamp / EMF signage (3) check if available and fix (FIM) if not available / damaged |
| 4 | Aviation lamp check if available |
| 5 | GBM Door Gasket check |
| 6 | Check Energy Meter status Healthy /Damage |
| 7 | Electricity Bill collection & Deposition |
| 8 | Site Hygiene check |

1. **ISP Maintenance**

|  |  |
| --- | --- |
| Sr. No | Activities |
| 1 | Carrying out corrective actions as per the instructions of NOC |
| 2 | Reset and/or Replacement of HW /cards |
| 3 | Replacing Faulty cards with Healthy Spares at site |
| 4 | Bring the faulty Module from Site to CMP |
| 5 | Providing data for Consumption booking in SAP |
| 6 | Node Hygiene check, Clearing of unwanted alarms |
| 7 | Cleaning of Air Filters, FAN Modules including RRF units FAN (if any ) |
| 8 | Check health status of the stand by modules |
| 9 | Any other activity not listed above (Corrective/Preventive) and necessary for health of the Network incl. 4G and 5G equipment will be  communicated time to time |

1. **Maintenance Activities for all Facilities**

|  |  |
| --- | --- |
| Maintenance Activities for all Facilities | |
| Sr. No | Activities |
| 1 | Patch Cord/ eCPRI /CPRI Cable/ Power Cable Cleaning and replacement on faults (Routing/ Labelling/ Tieing should be proper after replacement of HW. Faulty Cable/ Cord should be removed) |
| 2 | Replacement of Air-Filter/ Fan Module/ Cards/HW/ RRH FAN, SFP modules etc. on Faults |
| 3 | Support for NE Visibility to NOC and any configuration implementation under the guidance of NOC using console. |
| 4 | Co-ordination with NOC on Fault Clearence |
| 5 | Active Antennas of 5G /RF Antenna Electric/ Mechanical Tilt, Antenna Height Up and Down, Antenna Replacement etc. |
| 6 | Corrective repair of ODSC/IBS / Wi-Fi Hotspot (AP) switches |
| 7 | Corrective repairs of equipment against Alarms / TT |
| 8 | Any other activity not listed above (Corrective/Preventive) and necessary for health of the Network incl. 4G and 5G equipment will be communicated time to time |

Any other activity not listed above (corrective/preventive) and necessary for health of the Network incl 4G and 5G equipment will be communicated time to time.

# Annexure – V: Manpower Dimensioning for Tower & Fiber Network

Dimensioning of Resources shall be done considering following points.

1. The number of resources mentioned are minimum requirement. This being a purely SLA/KPI based maintenance contact, SP will deploy the required resources and infrastructure as needed to achieve / sustain the defined KPI/SLA. However, for additional manpower requirement/ deployment has to be agreed with CTO on quarterly basis and signed of one month before the start of each quarter. In case SP envisages the higher attrition rate w.rt to availability of skillset SP will need to consider keeping the bench strength. SP will share the manpower details as and when demanded by CTO. These additional manpower needs to be factored in the cost and no additional cost will be paid.
2. The SPs which are also rendering project services to RJIL will ensure that there are separate teams and supervisors deployed, each for project and O&M activities.
3. Multi skill approach to be followed for technician. Technician also to be imparted training to work at height.
4. SP to depute one Key Account Manager (KAM) who will operate as a single point contact from their end.

### Resource Dimensioning

* 1. **Fiber Restoration Team (FRT)**

1. Splicer: 1 No.
2. Assistant Splicer: 1 No.
3. Labor: 2 Nos.
4. Vehicle with Driver
   1. **FTTx Maintenance Team (FTMT)**
5. Engineer: 1 No.
6. Technician: 1 No.
7. FTMT @ 1per Jio Center (JC) / 12 OLTs.
   1. **Tower Restoration Team (TRT)**
8. Technician - 1 No.
9. Rigger- 1 No.

### Skill set of Resources.

The required skill set for the resources to be deployed will be as below. SP will take ownership for arrangement of skilled manpower with required certifications.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Skill Set Requirement for Network O&M Resources** | | | | |
| **Sr. No** | **Resources** | **Qualification & Skill Set** | **Experience** | **Mandatory Document** |
| 1 | Tower Technician | ITI (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 4-7 yrs. | Medical Certificate, Driving License, Police NOC |
| 2 | Tower Rigger | 10+2 / ITI (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 1-3 yrs. | Medical Certificate, Driving License, Police NOC |
| 3 | Tower Supervisor | Diploma Engineer (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 6-10 yrs. | Medical Certificate, Driving License, Police NOC |
| 4 | Patroller | 10th & above | 1-2 yrs. | Medical Certificate, Driving License, Police NOC |
| 5 | Asst. Splicer | 10th /10+2 or ITI / Diploma (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 2-4 yrs. | Medical Certificate, Police NOC |
| 6 | Splicer | 10th /10+2 or ITI / Diploma (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 4-6 yrs. | Medical Certificate, Police NOC |
| 7 | Fibre Supervisor | Diploma Engineer (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 4‐6 yrs. | Medical Certificate, Driving License, Police NOC |
| 8 | FTTx Engineer | Graduate Engineer/Diploma (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 2-4 yrs. | Medical Certificate, Driving License, Police NOC |
| 9 | FTTx Technician | ITI (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 2-4 yrs. | Medical Certificate, Driving License, Police NOC |
| 10 | WH I/C cum security | 10+2 experience in Warehousing | 2-4 yrs. |  |
| 11 | Operations Head - State Level | Graduate Engineer (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 10-15 yrs. | Medical Certificate, Driving License, Police NOC |
| 12 | Utility SME - State Level | Graduate Engineer (ELE/E&E) | 8-12 yrs. | Medical Certificate, Driving License, Police NOC |
| 13 | Fiber SME - State Level | Graduate Engineer (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 8-12 yrs. | Medical Certificate, Driving License, Police NOC |
| 14 | MP Lead | Graduate Engineer (ELE / E&E / E&C / Electronics / E&I / Instrumentation / Mechanical) | 5-10 yrs. | Medical Certificate, Driving License, Police NOC |
| 15 | HSEF Officer-State Level | Graduate Engineer (any Trade) | 5-10 yrs. | Medical Certificate, Driving License, Police NOC, Diploma in Safety |

### Proposed Minimum Manpower calculation basis for O&M of Fiber Network & Tower sites

| **Sr. No** | **Job Role** | **Proposed Criteria** |
| --- | --- | --- |
| 1 | Technician (4G only , 4G + 5G ) | Refer to Minimum Dimensioning – Tower table for further details |
| 2 | Rigger (4G only , 4G + 5G ) | Refer to Minimum Dimensioning – Tower table for further details |
| 3 | FRT (1-Splicer, 1-Asst. Splicer, 2-Helper, 1-Driver,1-Vehicle) | Refer to FRT dimensioning table for further details |
| 4 | FRT Supervisor | **Intracity & Intercity Fiber -**  1- One Supervisor for every 2 FRT teams  **FTTx -**  1- One Supervisor for every 3 FRT teams |
| 5 | Utility Supervisor | 1 per 300 Sites |
| 7 | Telecom Equipment Supervisor(ISP Engr) | 2 per CMP |
| 8 | Analyst- CMP | 10 per CMP  (Two-Utility, Two – Power & Fuel, Two – Fiber/ FTTx, Two - Material, Two -D2D) |
| 9 | Circle Analyst Support team & Leads | 13 for Chennai ( common for TN1)  Details captured on page 100 |
| 10 | Circle Head | 1 per Circle for Chennai ( Common for TN1) |
| 11 | Fiber Engineer | 2 per CMP |
| 12 | Fiber SME | 1 per Circle for Chennai |
| 13 | FTTx SME | 1 per Circle for Chennai |
| 14 | Utility SME | 1 per Circle for Chennai |
| 15 | Telecom Equipment SME(ISP) | 1 per Circle for Chennai |
| 16 | Patroller | Mentioned in the below matrix |
| 15 | Route Guard in area where Fiber is lying on Road/ under GCC construction | Mentioned in the below matrix |
| 16 | Material Vehicle/ Utility Vehicle (Vehicle+ 2 Helper) | 3 Material Vehicle per CMP |
| 17 | MP WH in charge | 1 per CMP |
| 18 | NOC - Diploma/Engineer (Alarm Monitoring) | 10 per CMP  Breakup of Manpower –  3 Persons- Low SOC/ Site Down/MFL Alarms, ESC, HPODSC & Small Cells(1 per shift) 3 Persons- Fiber/FTTx( 1 per shift ) 2 Persons - Reliver  2 Persons - Geneal shift |
| 19 | FTMT Team | 1 FTMT per 12 OLT Capping |
| 20 | Diesel Filling Vehicle | 2 per CMP |
| 21 | Vegetation clearance | 6 per CMP |
| 22 | OMCR (Per Shift manpower requirement - Operation & Maintenance Call Record  1- Low SOC/ Site Down,  1- Fiber  1- FTTx 1- MFL Alarms, ESC, HPODSC & Small Cells,  2-Shift Lead/General shift  4-Reliver | 24\*7 Monitoring teams are required  18 required for Chennai @ SHQ (Common TN1)  Details captured on page 101 |
| 23 | Civil Teams (4-Labour, 1-Driver,1-Vehicle) | Mentioned in the below matrix |
| 24 | CMP Lead | For Chennai -  Fiber Lead - 2 per CMP Utility Lead - 2 per CMP |
| 25 | Utility Engineer | 1 per CMP |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Indicative Dimensioning -Tower** | | | | |
| **Sr no** | **Site Type** | **4G or 4G+5G (TRT)** | | |
|  |  | **METRO** | **NORMAL** | **HILLY** |
| 1 | eNodeB-P1 Non Dg | 42 | 41 | NA |
| 2 | eNodeB-P1 / Rcom Colo-RP1 with DG | 27 | 26 |
| 3 | IP Colo-IP1 | 50 | 52 |
| 4 | Outdoor Small Cell with UBR/Backhaul | 50 | 55 |
| 5 | 4G ESC (Non Dg) with UBR | 60 | 60 |
| 6 | MFL | 10 | 10 |
| 7 | Solar | 24 | 20 |

**FRT Dimensioning for Chennai :**

| **Si No.** | **Category** | **Design Basis** | **Domain** | **Unit** | **Chennai** |
| --- | --- | --- | --- | --- | --- |
| 1 | FRTs requirement | NLD-Intercity | Fiber | One Number | Per 150 KM |
| 2 | Intracity | Fiber | One Number | Per 150 KM |
| 3 | PM | Fiber | One Number | 3 Per CMP |
| 4 | FTTx | FTTx | One Number | Per 200 KM |
| 5 | Civil team | Civil team | Fiber & FTTx | One Number | 30% of FRT Team |
| 6 | Patroller | Patroller - NLD Intercity | Fiber | One Number | Per 80 KM |
| 7 | Patroller - Intracity | Fiber | One Number | Per 80 KM |
| 8 | Patroller Night | Fiber | One Number | Per 100 KM |
| 9 | Route guard | Route Guard - Fiber | Fiber | One Number | Per 50 KM |
| 10 | Route Guard - FTTx | FTTx | One Number | Per 2 JC |
| 11 | FTMT Team | FTTx | FTTx | One Number | Per 12 OLTs |

Note 1 : Intercity + Intracity to be maintained by FRT

Note 2 : F&D to be maintained by FTTx FRT Team

**Hilly Terrain State (MP) :-**

AS, HP, JA, UA, KS, NE, WB (Siliguri)

**Metro Cities/Top 20 cities :-**

DL-NCR, MU, Kolkata, Bangalore, AP ( Vishakhapatnam), Gujarat ( Vadodara, Surat , Ahmedabad), Kerala (Ernakulum), MP ( Indore, Bhopal), MH ( Pune, Nagpur), PB (Chandigarh), RJ ( Jaipur), TG (

Hyderabad), UE ( Lucknow, Kanpur), TN ( Chennai, Coimbatore)

**Normal Terrain:-**

States and CMP not covered under Hilly and Metro/ Top 20 cities are covered under Normal Terrain.

Minimum SHQ and MP Job Role Structure for SP O & M Manpower

Hierarchy of Job Roles is as below :

**GCC Liaison Lead**

State Operation Head

FRT Supervisor

**GCC Liaison Supervisor**

Utility Supervisor

CMP Lead

State Utility SME

State Fibre SME

Utility Engineer

State ISP SME

Fibre Engineer

State Planning Mgr

ISP Engineer

State Material Mgr

State HSEF Officer

Analyst

OMCR Resources

Energy Lead

Warehouse Incharge

cum Security

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function** | **Job Role** | **SHQ** | **MP** | **Maximum headcount onboarding**  **Allowed** |
| Fibre | State Operation Head | Yes |  | 1 at State Level / Geography |
| Fibre | State Fibre SME | Yes |  | 1 at State Level / Geography |
| Utility | State Utility SME | Yes |  | 1 at State Level / Geography |
| ISP | State ISP SME | Yes |  | 1 at State Level / Geography |
| Utility | Energy Lead | Yes |  | 1 at State Level / Geography |
| Support Function | State Planning Manager | Yes |  | 1 at State Level / Geography |
| Support Function | State Material Manager | Yes |  | 1 at State Level / Geography |
| Support Function | State HSEF Officer | Yes |  | 1 at State Level / Geography |
| Support Function | Analyst | Yes | Yes | 10 per MP & 13 at SHQ ( Small State) |
|  |
| Support Function | OMCR Resources | Yes | Yes |  |
| 10 per MP & 18 at SHQ ( Small State) |
| Utility | CMP Lead |  | Yes | 4 per MP(fiber 2 + utility 4 ) |
| Utility | Utility Engineer |  | Yes | 1 per MP |
| Fibre | Fibre Engineer |  | Yes | 1 per MP |
| ISP | ISP Engineer |  | Yes | 2 per MP |
| Support Function | Warehouse Incharge cum Security |  | Yes | 1 per MP |

|  |  |  |  |
| --- | --- | --- | --- |
| **Large States ( More than 5 MP )** | | | |
| **Job Role** | **Proposed Max Analyst Resources**  **per MP** |  | **Proposed Max Analyst**  **Resources at**  **SHQ** |
| **Total** | **6** |  | **22** |
| Analyst – Utility | 1 |  | 4 |
| Analyst -Power & Fuel | 2 |  | 4 |
| Analyst -Fiber | 1 |  | 2 |
| Analyst -Material | 1 |  | 2 |
| Analyst -D2D | 1 |  | 2 |
| Analyst -Project |  |  | 1 |
| Analyst -ISP |  |  | 1 |
| Analyst -Planning |  |  | 1 |
| Analyst -HSEF |  |  | 1 |
| Analyst -SAS |  |  | 1 |
| Analyst -FTTX |  |  | 1 |
| Analyst -IPCOLO |  |  | 1 |
| Analyst -PMO |  |  | 1 |

|  |  |  |
| --- | --- | --- |
| **Small States \* ( Less than 5 MP )** | | |
| **Proposed Max Analyst Resources per**  **MP** |  | **Proposed Analyst Resources at**  **SHQ** |
| **6** |  | **13** |
| 1 |  | 1 |
| 2 |  | 1 |
| 1 |  | 1 |
| 1 |  | 1 |
| 1 |  | 1 |
|  |  | 1 |
|  |  | 1 |
|  |  | 1 |
|  |  | 1 |
|  |  | 1 |
|  |  | 1 |
|  |  | 1 |
|  |  | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Large States ( More than 5 MP )** | | | |
| **Details** | **Proposed OMCR**  **Resources at**  **MP** |  | **Proposed OMCR**  **Resources at**  **SHQ** |
| **Total Resources** | **4** |  | **26** |
| No of Shifts | 3 |  | 3 |
| Person per shift | 1 |  | 6 |
| Reliever | 1 |  | 6 |
| G Shift Persons |  |  | 2 |

|  |  |  |
| --- | --- | --- |
| **Small States\* ( Less than 5 MP )** | | |
| **Proposed OMCR Resources at MP** |  | **Proposed OMCR Resources at**  **SHQ** |
| **4** |  | **18** |
| 3 |  | 3 |
|  |  | 4 |
| 1 |  | 4 |
|  |  | 2 |

# Annexure – VI: List of Free Issue material (FIM) and Test & Measurement Instruments (TMI)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **LIST OF SPECIAL TMI EQUIPMENT PER NLD FRT** | | | | |
| **THAT SHALL BE SUPPLIED BY RJIL TO SP AS FIM** | | | | |
| **Sr. No.** | **Item Description** | **UOM** | **Quantity** | **Remarks** |
| 1 | Splice Machine, Single Fiber | No | 1 |  |
| 2 | Optical Time Domain Reflectometer (OTDR) | No | 1 |  |
| 3 | Optical Light Source (OLS) | No | 2 |  |
| 4 | Optical Power Meter (OPM) | No | 2 |  |
| 5 | Cable Route Locator | No | 1 |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **LIST OF SPECIAL TMI EQUIPMENT PER INC FRT** | | | | |
| **THAT SHALL BE SUPPLIED BY RJIL TO SP AS FIM** | | | | |
| **Sr. No.** | **Item Description** | **UOM** | **Quantity** | **Remarks** |
| 1 | Splice Machine, Single Fiber | No | 1 |  |
| 2 | Splice Machine, Ribbon Fiber | No | 1 |  |
| 3 | Optical Time Domain Reflectometer (OTDR) | No | 1 |  |
| 4 | Optical Light Source (OLS) | No | 2 |  |
| 5 | Optical Power Meter (OPM) | No | 2 |  |
| 6 | Cable Route Locator | No | 1 |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **LIST OF SPECIAL TMI EQUIPMENT PER FTMT** | | | | |
| **THAT SHALL BE SUPPLIED BY RJIL TO SP AS FIM** | | | | |
| **Sr. No.** | **Item Description** | **UOM** | **Quantity** | **Remarks** |
| 1 | Red Light Identifier /Visual Fault Locator (VFL) | No | 1 |  |
| 2 | Optical Light Source (OLS) | No | 2 |  |
| 3 | Optical Power Meter (OPM) | No | 2 |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **LIST OF SPECIAL TMI EQUIPMENT PER F&D FRT** | | | | |
| **THAT SHALL BE SUPPLIED BY RJIL TO SP AS FIM** | | | | |
| **Sr. No.** | **Item Description** | **UOM** | **Quantity** | **Remarks** |
| 1 | Splice Machine, Single Fiber | No | 1 |  |
| 2 | Optical Time Domain Reflectometer (OTDR) | No | 1 |  |
| 3 | Optical Light Source (OLS) | No | 2 |  |
| 4 | Optical Power Meter (OPM) | No | 2 |  |
| 5 | Cable Route Locator (For UG Section Only) | No | 1 |  |

**Note:**

1. All the above special TMI equipment shall be supplied by RJIL to SP as FIM
2. AMC/CAMC and calibration of the above equipment are in RJIL scope.
3. Co-ordination with the AMC/CAMC vendor shall be in SP scope.
4. Balance all equipment mentioned in Annexure-II is in SP scope.

|  |  |  |  |
| --- | --- | --- | --- |
| **Annexure - VI** | | | |
| **List of Tools in FRT** | | | |
| **Sr. No.** | **Item Description** | **Specifications** | **Remarks** |
| 1 | Fusion Splicing Machine, Single Fiber with cleaver, Heater, Battery, AC Adaptor with Hard Case |  | FIM |
| 2 | Fusion Splicing Machine, Ribbon Fiber with cleaver, Heater, Battery, AC Adaptor with Hard Case |  | FIM (Optional for NLD FRT) |
| 3 | Optical Fiber Cable Preparation Tool Kit consisting of: |  | FIM |
| a | Universal Screwdriver set with replaceable Bits |  |  |
| b | Long Screwdriver Flat, Min 12 inch |  |  |
| c | Long Screwdriver Star, Min 12 inch |  |  |
| d | Torch |  |  |
| e | Measuring Tape 5 m |  |  |
| f | Utility Knife with replaceable blade (02 no’s) |  |  |
| g | Socket Wrench-SW8/ SW10/ SW11/ SW13: screw M5/M6/M6/M8 respectively for Opening and closing of joint closures and general purpose |  |  |
| h | Tweezers: Universal |  |  |
| i | Hammer (1 kg) |  |  |
| j | Fiber Stripper 0.6 -1.1 mm, 0.18-0.30 mm: for stripping tight jacketed fiber & 250 um coating respectively |  |  |
| k | Square Nose Plier: Universal |  |  |
| l | Needle Nose Pliers: Universal |  |  |
| m | Cable Sheath/ Jacket Rotary Stripper |  |  |
| n | Cable Cutter (suitable up to 25mm diameter of cable-suitable for cutting metal armour and strength member) |  |  |
| o | Cable Alpha Cutter/ Hacksaw 6-8 inches with 02 spare blades |  |  |
| p | Allen Key set 4-10mm |  |  |
| q | Bolt Cutter - for cutting central strength member (Steel Wire) up to 2.2mm diameter |  |  |
| r | Loose tube Cutter suitable for 1.5mm to 5.2mm diameter. |  |  |
| s | Mid span cable sheath cutter (suitable for 10mm to 25mm diameter of armoured cable with sheath thickness of 1.5mm to 2.5mm) |  |  |
| t | Duct Cutter (suitable for 10mm to 50mm diameter of duct). Min 1000 cycles of operation |  |  |
| u | Shampering tool for Ducts (suitable for 10mm to 50mm diameter) |  |  |
| v | Mid span tool for buffer tube suitable to slit buffer tube suitable for tube diameter of 1.8 mm to 5.2mm diameter. Min 500 cycles of operation |  |  |
| w | Ceramic Kevlar Scissors: Universal, to cut Kevlar/ Aramid yarn, rip chord |  |  |
| x | Carrying Case for entire tool Kit: Suitable carrying case to hold all the tools either soft or hard |  |  |
| 4 | Optical Light Source & Power meter (LSPM) with accessories (Carrying case, patch cord set, battery, AC adaptor) |  | FIM |
| 5 | Tripod with chain pulley (For manhole cover lifting) or any other suitable arrangement for lifting MH covers |  |  |
| 6 | Optical Time Domain Reflectometer (OTDR) |  | FIM |
| 7 | Cable Route Locator |  | FIM |
| 8 | Generator set 2KVA with fuel can or charged Battery Pack with extension board |  | for lighting, hot air blower, OTDR, Splicing machines |
| 9 | Light Lamp (Preferably, LED light) |  |  |
| 10 | Portable Splicing Tent for conducting splicing | Suggested size 6'x6'x7' | Portable quick erect enclosure for use where splice cannot be made in FRT vehicle |
| 11 | CleTop / Clean Master (pen type cleaning kit) |  | FIM |
| 12 | Joint Closures/OFC/Duct/Couplers/Plugs |  | FIM |
| 13 | Misc. Digging Tools |  |  |
| 14 | Hook Connected to Vehicle for pulling Mobile DG | To be able to pull 1 Ton Load of Mobile DG |  |
| 15 | Fire Extinguisher |  |  |
| 16 | Seat Belt, Spare Tyre, jack and tool Kit, Warning Sign |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Annexure-VI** | | | |
| **LIST OF TOOLS WITH FTMT** | | | |
| **Sr. No** | **Item** | **Specification** | **Remark** |
| 1 | Universal Screwdriver set with replaceable Bits |  |  |
| 2 | Long Screwdriver Flat, Min 12 inch |  |  |
| 3 | Long Screwdriver Star, Min 12 inch |  |  |
| 4 | Torch |  |  |
| 5 | Tweezers: Universal |  |  |
| 6 | Hammer (1 kg) |  |  |
| 7 | Square Nose Plier: Universal |  |  |
| 8 | Needle Nose Pliers: Universal |  |  |
| 9 | Multimeter |  |  |
| 10 | Cletop Cleaning Kit (2.5/1.25 mm pen type & connector cleaner) |  |  |
| 11 | Air Blower for HexODC/OLT PM |  |  |
| 12 | Drill machine |  | @ one per JC for ODN Fixing |
| 13 | HSEF KIT |  |  |
| 14 | Folding ladder for ODN Maintenance |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Annexure-VI** | | | |
| **LIST OF TOOLS IN MATERIAL VEHICLE** | | | |
| **Sr. No** | **Item Description** | **Specifications** | **Remarks** |
| 1 | Information Boards | Information Boards Collapsible Traffic Sign Size 750 mm. | As required |
| a. Road Works Signs | As required |
| b. Pedestrian arrow | As required |
| c. Guard Barriers/Rails | As required |
| d. Traffic Cones | As required |
| e. Road Safety Lamps | As required |
| f. Stop Go Signs | As required |
| 2 | Portable Lighting System | LED Lamp with necessary cable length, suitable for night Operations | For night operations |
| 3 | Dewatering Pump (3 HP) with Hoses along with Fuel Can to carry extra fuel. | Recommended capacity 600 LPM, head 30M, 3HP, 3500 RPM (fuel driven) | To be kept ready at MP or in Material Vehicle |
| 4 | Trench Shovel | With Wooden Handle, Light Weight Spade, With Slightly Dished Blade, Length - 1M. | Hand-digging trenches to expose damaged duct or cable |
| 5 | Digging Bar | Size 1500 X 32 mm and Style Diamond / Chisel or Equivalent | For digging in difficult soils & awkward places |
| 6 | Pick | General Purpose PICK, With Chisel and Diamond Point Ends, Length - 1M . | For breaking hard soils |
| 7 | Crowbar | Size 1500 X 32 mm and Style Diamond / Chisel or Equivalent | For driving and levering |
| 8 | Punner | Weight 10 Pound, Length 1400mm, Head 130 x 130 mm or Equivalent. | For compaction of excavation backfill materials |
| 9 | Manhole/Handhole Cover Lifting Hook | Suitable to take care of 1 Ton weight | For safe handling of covers |
| 10 | Duct Rodder | 8 mm continuous Rod 300 m | FIM. For continuous pulling / drawing string or duct tracing with a duct rod Oscillator. As required. |
| 11 | Cable Guides | Suitable for upto 40 mm duct. | FIM. To protect and guide cable when entering & leaving duct. As required. |
| 12 | D Shackle, 1 T Chain pulley block 3 T x 9 meter or suitable arrangement to lift Manhole covers and Manholes. |  | As required |
| 13 | Derrick Pipe |  |
| 14 | Bearing Type, Single / Double Pulley Rope, Pulley Sling, wire rope, 1 T |  |
| 15 | Hook Connected to Vehicle for pulling Mobile DG | To be able to pull 1 Ton Load of Mobile DG |
| 16 | Fire Extinguisher |  |
| 17 | Seat Belt, Spare Tyre, jack and tool Kit, Warning Sign |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Material:** | |  | |  | |
| 1 | OFC | |  | | FIM | |
| 2 | Joint Closure with accessories | |  | | FIM | |
| 3 | Duct | |  | | FIM | |
| 4 | MH/HH | |  | | FIM | |
| 5 | Duct Coupler | |  | | FIM | |
| 6 | Simplex plugs | |  | | FIM | |
| 7 | End plugs | |  | | FIM | |
|  | | | | | | | |
| **Annexure-VI** | | | | | | | |
| **LIST OF TOOLS WITH TECHNICIAN / RIGGER** | | | | | | | |
| **Sr. No** | | **Item Description** | | **Specifications** | | **Remarks** | |
| 1 | | Allen Key set | | (1.5 - 10) mm | |  | |
| 2 | | Allen Key set | | (1/16 to 3/8 ") | |  | |
| 3 | | Crimping tool | | (1.5-16) sqmm | |  | |
| 4 | | D Spanners set | | (6-32) mm | |  | |
| 5 | | Ring Spanners set | | (6-32) mm | |  | |
| 6 | | Screwdriver set | | Multi heads | |  | |
| 7 | | Hacksaw frame with blade | | 6-19 mm | |  | |
| 8 | | Flat File, course and fine | |  | |  | |
| 9 | | Round file, course and fine | |  | |  | |
| 10 | | Hammer with Handle | | 3 LB | |  | |
| 11 | | Screw spanner | | 12 inches | |  | |
| 12 | | Combination plier | | 10 inches | |  | |
| 13 | | Nose plier | | 160 mm | |  | |
| 14 | | Circlip plier inner | |  | |  | |
| 15 | | Pipe wrench | | 12" | |  | |
| 16 | | Crimping tool | | RJ45 / 11 | |  | |
| 17 | | Chisel | | 12" | |  | |
| 18 | | Knife | | 6 inches | |  | |
| 19 | | Scissors | | 130 mm | |  | |
| 20 | | Torch (Flashlight) | |  | |  | |
| 21 | | Extension board | | 10m wire | |  | |
| 22 | | Soldering iron | | 25-60W, 230V | |  | |
| 23 | | Desoldering iron | |  | |  | |
| 24 | | Line Voltage tester | | 500V | |  | |
| 25 | | Continuity tester | |  | |  | |
| 26 | | Toolbox with lock | | Suitable for m/cycle | |  | |
| 27 | | Digital Multimeter | | 1000v (AC/DC), 10A(AC/DC) | |  | |
| 28 | | Spirit Level gauge | |  | |  | |
| 29 | | Torx Screwdriver T20 | | Taparia | |  | |
| 30 | | Measuring Tape | | 5m | |  | |
| 31 | | Brush for Air filter/Fan cleaning | |  | |  | |
| 32 | | Hand Air Blower | | 230v,500W, 200 cfm | |  | |
| 33 | | Technicians First Aid Kit | |  | |  | |
| 34 | | Raincoat | |  | | As required | |
| 35 | | Handheld Tablet | | FIM | |
| 36 | | CleTop / Clean Master (pen type cleaning kit) | | FIM | |
| 37 | | Locks for LOTO | | FIM | |
| 38 | | Splitters (1:8 and 2:8) | | FIM | |
| 39 | | All type of testing patch cords(1m) | | FIM | |
| 40 | | Hole bar | | 16mm dia. rod | |

|  |  |  |  |
| --- | --- | --- | --- |
| 41 | Arcflash Suit (for Large Facilities) | FIM |  |
| 42 | Compass |  |  |
| 43 | RPE FIBRE 18MM 11KG/M JUTE 3 |  |  |
| 44 | BAG, REXIN, TOOL |  |  |
| 45 | MARKER PEN, PERMANENT, COLOUR: BLACK |  |  |
| 46 | CUTTER, SIDE, ULTRA FLUSH CUT, MM:1405 |  | As required |
| 47 | CUTTER, TIN; SIZE:10 IN |  |
| 48 | CUTTER, KNIFE, SNAP OFF, SIZE:80MMX9MM |  |
| 49 | CUTTER, STRIPPER, WIRE; SIZE:6" |  |
| 50 | PLIER; CUTTING, SIDE; SIZE:8 IN |  |

**Note:** Calibration of SP's TMI is in SP's scope

Apart from above tools set, any additional tools proposed by new 5G OEM will be added once it is finalized.

|  |  |  |  |
| --- | --- | --- | --- |
| **Annexure-VI** | | | |
| **LIST OF TOOLS IN MP** | | | |
| **Sr. No** | **Item Description** | **Spec** | **Remarks** |
| 1 | Scaffolding |  | FIM |
| 2 | Heat Shrink Gun / Hot Air Blower |  |  |
| 3 | Crimping Tool | 70sqmm |  |
| 4 | Hydraulic crimping tool | 400 sq.mm |  |
| 5 | Earth tester | Spike rod type |  |
| 6 | Earth tester | Clamp type | FIM |
| 7 | Lux meter | 0 - 1000 Lumens | FIM |
| 8 | Db measurement (noise level) meter, Digital type | up to 130 dBA | FIM |
| 9 | Humidity & temp tester / Anemometer |  | FIM |
| 10 | Phase sequence indicator | 415 V AC | FIM |
| 11 | Infrared thermometer |  | FIM |
| 12 | Digital Multimeter (clamp on type) |  |  |
| 13 | Portable vibration meter |  | FIM |
| 14 | Vernier Caliper | (0-200) mm |  |
| 15 | Insulated Screwdriver | 12 inches |  |
| 16 | Laptop for Tower Supervisors | (for Tower Supervisors only) |  |
| 17 | Hydrometer (Liquid Specific Gravity / Density meter) | (for diesel) |  |
| 18 | COMPASS, SILVA RANGER PRO; MODEL 25 TDCL/E (AZIMUTH) |  | FIM |
| 19 | Aluminum ladder, 6 M long |  |  |
| 20 | Hand Operated barrel Pump for diesel |  |  |
| 21 | Sling, Wire rope, 3000 MM Long, 2T |  |  |
| 22 | Sling, Wire rope, 6000 MM Long, 3T |  |  |
| 23 | D Shackle, 2 T / 3 T |  |  |
| 24 | Chain pulley block 5 T x 3 meter |  |  |
| 25 | Hand Hacksaw frame 12" |  |  |
| 26 | Connector inspection microscope | 400 x optics with coaxial illumination | FIM |
| 27 | Rope, Nylon, Size:12MM Dia |  |  |
| 28 | MH/HH lifting arrangement |  |  |
| 29 | Extension Board (50 mtr) with lighting arrangement |  |  |
| 30 | Warning Safety Signs & Barricades |  |  |
| 31 | LADDER, ALUMINAUM, SINGLE, SIZE:8MTR |  |  |
| 32 | CLEANER; VACCUM, EASY CLEAN 800W Industrial |  |  |
| 33 | CHAIN, PULLEY BLOCK; CAP:3T, 9&17MTR LENGTH |  |  |
| 34 | PP Ropes (3/4-200 mtrs) |  |  |
| 35 | Measuring Tape -50 mtr |  |  |
| 36 | Spanner 55 mm Ring | (Foundation Bolts) | As required |
| 37 | Spanner 55 mm Flat End | (Foundation Bolts) |
| 38 | Spanner 46-48 mm Flat End | (Foundation Bolts) |
| 39 | Spanner 46-48 mm Ring | (Foundation Bolts) |
| 40 | Spanner 36-40 mm Flat End |  |  |
| 41 | Spanner 36-40 mm Ring |  |  |
| 42 | Spanner 36-38 mm Ring |  |  |
| 43 | Spanner 36-38 mm Flat End |  |  |
| 44 | Tubular box Spanner Set | (6-24) mm |  |
| 45 | Torque Wrench with sockets | (0.75-20) Nm | FIM |
| 46 | Insulation Resistance Tester | 500 V DC | FIM |
| 47 | Level gauge |  |  |
| 48 | Umbrella |  |  |
| 49 | Chopper for cutting vegetation |  |  |
| 50 | Flood light fitting | with 20 meters flexible cable |  |
| 51 | Ethernet Tester 10/100/1000, |  | FIM |
| 52 | Optical attenuator |  | FIM |
| 53 | Laser Source & Power Meter |  | FIM |
| 54 | BLOCK, CABLE; PN: ESK/CB/S-20/V.0 |  | FIM |
| 55 | KRONE INSERTION TOOL |  | FIM |
| 56 | TESTER FE/GE/SINGLE PORT 10GE |  | FIM |
| 57 | USB to Serial Converter to login router Make - BAFO |  | FIM |
| 58 | Rodometer |  |  |
| 59 | Live Fiber Identifier (LFI) |  | FIM |
| 60 | Visual Fault Locator (VFL) |  | FIM |

**Note:** Calibration of SP's TMI is in SP's scope

Qty. of Laptop is to be based on the Actual number of Network Elements & No. of Supervisor (ENB, gNB, ESC, 4G & 5G ODSC, UBR, CSS, MW, etc.)

|  |  |  |  |
| --- | --- | --- | --- |
| **Annexure-VI** | | | |
| **LIST OF SPARES / CONSUMABLES IN MP** | | | |
| **Sr. No.** | **Item Description** | **Category** | **Remarks** |
| 1 | HDPE DUCT, 40MM OD,3.5 MM THICK, GREY COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 2 | HDPE DUCT, 40MM OD,3.5 MM THICK, BLUE COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 3 | HDPE DUCT,40MM OD,3.5MM THICK, BLUE STRIPES ON WHITE, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 4 | HDPE DUCT,40MM OD,3.5MM THICK, ORANGE STRIPES ON WHITE, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 5 | HDPE DUCT, 40MM OD,3.5 MM THICK, GREEN COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 6 | HDPE DUCT, 40MM OD,3.5 MM THICK, BLACK COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 7 | HDPE DUCT, 40MM OD,3.5 MM THICK, BROWN COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 8 | HDPE DUCT, 40MM OD,3.5 MM THICK, ORANGE COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 9 | HDPE DUCT, 40MM OD,3.5 MM THICK, RED COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 10 | HDPE DUCT, 40MM OD,3.5 MM THICK, YELLOW STRIPES ON BLUE COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 11 | HDPE DUCT, 40MM OD,3.5 MM THICK, WHITE STRIPES ON GREEN COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 12 | HDPE DUCT, 40MM OD,3.5 MM THICK, VIOLET COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Item Description** | **Category** | **Remarks** |
| 13 | HDPE DUCT, 40MM OD,3.5 MM THICK, WHITE COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 14 | HDPE DUCT, 40MM OD,3.5 MM THICK, YELLOW COLOUR, PLAIN LUBRICATED | FIM | Spare duct lengths |
| 15 | HDPE DUCT, 40MM OD,3.5 MM THICK, GREY COLOUR, PLAIN NON- LUBRICATED | FIM | Spare duct lengths |
| 16 | HDPE DUCT, 40MM OD,3.5 MM THICK, BLUE COLOUR, PLAIN NON- LUBRICATED | FIM | Spare duct lengths |
| 17 | HDPE DUCT, 40MM OD,3.5 MM THICK, GREEN COLOUR, PLAIN NON-LUBRICATED | FIM | Spare duct lengths |
| 18 | HDPE DUCT, 40MM OD,3.5 MM THICK, BROWN C | FIM | Spare duct lengths |
| 19 | HDPE DUCT, 40MM OD,3.5 MM THICK, ORANGE | FIM | Spare duct lengths |
| 20 | HDPE DUCT, 40MM OD,3.5 MM THICK, RED COL | FIM | Spare duct lengths |
| 21 | HDPE DUCT, 40MM OD,3.5 MM THICK, VIOLET | FIM | Spare duct lengths |
| 22 | HDPE DUCT, 40MM OD,3.5 MM THICK, YELLOW | FIM | Spare duct lengths |
| 23 | Duct couplers 40 mm | FIM | Duct couplers |
| 24 | Duct end plug 40 mm | FIM | Duct plugs |
| 25 | Simplex Plug 40 mm | FIM |  |
| 26 | Manhole, Cover | FIM |  |
| 27 | Handhole, Cover | FIM |  |
| 28 | Route Marker | FIM |  |
| 29 | Optical Fiber Cable – G652D x 288F | FIM |  |
| 30 | Optical Fiber Cable – G652D x 144F | FIM |  |
| 31 | Optical Fiber Cable – G652D x 96F | FIM |  |
| 32 | Optical Fiber Cable – G652D x 48F | FIM |  |
| 33 | Nylon rope for pulling ducts 6 mm | Non-FIM |  |
| 34 | Joint Enclosure | FIM |  |
| 35 | Splice protectors (Heat shrinkable polythene material with central strength member) | FIM | As per current spec used by Construction |
| 36 | Cable ties | Non-FIM | Polythene/Nylon Tie locks assorted lengths 100 mm to 300 mm |
| 37 | Lint free wipes | Non-FIM | Any proprietary make as per Construction Specs |
| 38 | Iso-Propyl Alcohol | Non-FIM | 99.90% |
| 39 | Marker pen (Black) | Non-FIM | Indelible suitable for marking cables and tags (Black and white) 0.7 |
| 40 | Pigtail ASC | FIM | As per spec currently used on FMS termination Racks during construction |
| 41 | Patch cords ASC – connection of test equipment | FIM | 4xSC/APC Per MCN/IS Building (5m) |
| 42 | Pigtail Connectors | FIM | SC/APC connector with bare fiber end 2 m length |
| 43 | Marking Cloth | Non-FIM |  |
| 44 | Cotton Waste | Non-FIM |  |
| 45 | Teflon tape 1/2" | Non-FIM |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Item Description** | **Category** | **Remarks** |
| 46 | Solder wire roll, 100 gm | Non-FIM |  |
| 47 | Permanent marker | Non-FIM |  |
| 48 | Cleaner, Rust remover; AC-90/ Rustlik | FIM |  |
| 49 | Molykote, General Paste | FIM |  |
| 50 | Belzona, Super Metal Compound | FIM |  |
| 51 | M Seal,General Purpose | FIM |  |
| 52 | Cleaner, Contact, SCC2 | FIM |  |
| 53 | Perssian Blue 5 Grams Tube | FIM |  |
| 54 | Kit repair, E-Metal, Belzona | FIM |  |
| 55 | Rustolene; 500ml Container | FIM |  |
| 56 | Electrical 88, Protect against Moisture in can | FIM |  |
| 57 | Cleaner, Electronic Component; No.83, in can | FIM |  |
| 58 | Petroleum Jelly- White | FIM |  |
| 59 | Gasket Sheet Water service, 1.5 mm. 2 mm | FIM |  |
| 60 | Gasket Sheet Diesel service, 1.5 mm, 2 mm | FIM |  |
| 61 | Torch Cell large 1.5 V | Non-FIM |  |
| 62 | 1.5 Volts - pencil cell | Non-FIM |  |
| 63 | 9 Volts min. battery | FIM |  |
| 64 | LT Insulation tape- red color | Non-FIM |  |
| 65 | LT Insulation tape- yellow color | Non-FIM |  |
| 66 | LT Insulation tape- blue color | Non-FIM |  |
| 67 | LT Insulation tape-black color | Non-FIM |  |
| 68 | Battery terminal spray-cans | FIM |  |
| 69 | Cold galvanizing spray - cans | FIM |  |
| 70 | RTV 732 sealant | FIM |  |
| 71 | Hacksaw Blades 12" HSS, 18 TPI, make Miranda or equivalent | Non-FIM |  |
| 72 | Mini Hacksaw Blades HSS, 18 TPI, make Miranda or equivalent | Non-FIM |  |
| 73 | Drill bits suitable for pneumatic drill m/c (3 to 10 mm) | Non-FIM |  |
| 74 | Tarpaulin (for FRT work) | Non-FIM |  |
| 75 | CleTop/ Clean Master (pen type cleaning kit) | FIM |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Annexure-VI** | | | |
| **LIST OF SAFETY ITEMS** | | | |
| **Sr. No** | **Item Description** | **Spec** | **Remarks** |
| 1 | Safety Helmet- HDPE | Medium |  |
| 2 | Safety Shoes |  |  |
| 3 | Gum boots |  |  |
| 4 | Knitted Cotton Gloves | 12 inches |  |
| 5 | Electrical Gloves | Class-0 (1000 V) |  |
| 6 | Electrical Gloves | Class-1 (7500 V) | FIM |
| 7 | Electrical Gloves | Class-2 (17000 V) | FIM |
| 8 | Electrical Gloves | Class-3 (26500 V) | FIM |
| 9 | Electrical Gloves | Class-4 (36000 V) | FIM |
| 10 | Safety Spectacles, General purpose | - |  |
| 11 | Over spectacles-General purpose | - |  |
| 12 | Laser Safety Goggle | - | FIM |
| 13 | Earplug, with cord | - |  |
| 14 | Dust Mask | - |  |
| 15 | Fluorescent Jacket | - |  |
| 16 | Full Body Harness | - | FIM |
| 17 | Barricading/ Caution tape Red & White tubular color | 4 inches |  |
| 18 | Electrical isolation tag | 127x280MM | FIM |
| 19 | Traffic cones with hooks and Red & white, fluorescent tape | - |  |
| 20 | HDPE Chain 6 mtr length | - |  |
| 21 | Work in Progress Stand board | - |  |
| 22 | First aid box (for FRT & Material vehicles) |  |  |
| 23 | First aid box (for medium & large facilities) |  | FIM |
| 24 | Sticker for portable electrical equipment |  | FIM |
| 25 | Locks for LOTO |  | FIM |
| 26 | Arcflash Suit (for Large Facilities) |  | FIM |
| 27 | Technician's First Aid Kit |  |  |
| 28 | Raincoat |  |  |
| 29 | Umbrella |  |  |
| 30 | Fire Extinguisher |  |  |
| 31 | Seat Belt, Spare Tyre, jack and tool Kit, Warning Sign |  |  |
| 32 | Special PPE safety |  |  |
| 33 | Work Positioning Lanyard |  |  |
| 34 | Safety Gadgets (ALUrail Traveler, High Step Shoes & Rope Garb) |  |  |
| 35 | Reflective Belt for Bag Holding |  |  |
| 36 | Insulated Tool Kit |  |  |
| 37 | ISI Crash Helmet |  |  |

# Annexure – VII: Division of Responsibility (DOR) & RACI Matrix

### Division of Responsibilities as agreed between the Service Provider and RJIL

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No** | **Activity** | **Responsibility** | **Co-ordination** | **Remarks** |
| 1 | Specifying acceptable service levels for each activity | RJIL |  |  |
| 2 | Maintenance (PM, Corrective /  Breakdown) of all OFC and electronic equipment as per SLA. | SP |  | As per RJIL spec, SOP / SMP with the use of Automation tools provided by RJIL |
| 3 | Maintaining earthing system as per Service Level Agreement | SP |  |  |
| 4 | Coordination & support to OEM / AMC vendors for all Utility / Fiber TMI equipment | SP | RJIL | PM / LLF, FLM by SP. Warranty, Major repair etc. by OEM. |
| 5 | Preventive maintenance of all OFC, Utility and ISP equipment | SP | RJIL | SP to ensure the designed life of each equipment |
| 6 | OSP and electronics (ISP) Maintenance Service documentation (including work done reports and entry in SAP) | SP |  | Reports to be provided to RJIL, as per RJIL approved formats |
| 7 | Liasioning / coordination with concerned Govt. authorities Locals, Municipality, and others for obtaining permissions | SP |  | SEB, PCB, Electrical Inspector, police (Incident Report) etc. |
| 8 | Providing NOC information (SMS) / facilities and access to SP. | RJIL | SP | Co-ordination with NOC for work permits is in SP’s scope |
| 9 | Providing timely feedback / information of alarms, faults, rectification of faults, escalation,  entry in RJIL systems like SAP | SP | RJIL | SP to provide Android OS 4G Smart phones and Jio SIM to the personnel for the same. |
| 10 | Site access & Key Management | SP | RJIL | RJIL will provide support for Access control as per RJIL key management procedure |
| 11 | Pest Control and site hygiene  including site housekeeping, site vegetation cleaning | SP |  | SP to share the frequency of pest control and ensure cleanliness of all RJIL equipment at sites |
| 12 | Estate management – Co-ordination for disbursement of EB Power Bills, as applicable | SP | RJIL | SP is responsible for EB Power Bill cheque / DD collection & disbursement on time as per the due dates. RJIL will provide cheque or DD etc. |
| 13 | Fuel management of DG set | SP |  | SP to ensure no pilferage, spillage, leakage of diesel; entry in IEM Portal, OCR App compliance. |
| 14 | RCA process support / compliance and implementation  of RCA recommendations | SP | RJIL | SP to ensure support for RCA for each fault/cut / failure and follow RCA process of RJIL |
| 15 | Providing assistance and all type of support for any site upgradation, new installations and modifications in site. | SP | RJIL | SP to ensure all necessary support will be extended for commissioning and integrating them into the operating system |
| **Sr. No** | **Activity** | **Responsibility** | **Co-ordination** | **Remarks** |
| 16 | Arrangement of mobile DG sets | SP | RJIL | SP to submit Mobile DG set deployment / availability plan for each Maintenance Point. RJIL will approve |
| 17 | Fiber Repair consumable Duct, MH/HH, OFC, Joint Closures, Couplers, Plugs | RJIL | SP |  |
| 18 | Supply of special TMI like splice m/cs, OTDR, VFL, LSPM etc. & its calibration | RJIL | SP |  |
| 19 | New Trenching, Ducting & Blowing OFC, splicing, testing, installation of MH/HH/JC etc. for cut / fault rectification including excavation & backfilling | SP |  | To be done as per RJIL spec / SOP/SMP. Providing all P&M is in SP’s scope. |
| 20 | coordination ROW permission / approvals & Management - | SP |  | All official demand notes payments by RJIL. Local spot management by SP. |
| 21 | Spares / Consumables Management, Transportation of material from RJIL MP/ JC & SP Stores to Site and back (in Material vehicle at MP). Ensure proper packing e.g. Bubble / Thermocol wrapping; to avoid any damage during transit. | SP | RJIL | Transportation from RJIL state WH to MP stores is in RJIL scope and from RJIL MP stores to SP stores / sites and back will be in SP scope. Packing material will be FIM. |
| 22 | Insurance claims support | SP |  | Documents / IR support |
| 23 | Coordination & supervision of Building MEC maintenance | SP |  | Execution by third party |
| 24 | Validation of the experienced SP  manpower including trained / | SP | RJIL | RJIL will revalidate key resources |
| 25 | Providing tools and tackles required for the jobs as per Annexure-V | SP |  |  |
| 26 | Providing P&M, material handling equipment for the jobs | SP |  | Including ladder for access to heights (on masts) |
| 27 | Scaffolding erection for working at heights | SP |  | Material is in RJIL scope |
| 28 | HSEF compliance | SP |  | Including all PPEs, safety material, barricading etc. |
| 29 | Training compliance - Needs identification as per RJIL defined competency level, imparting training etc. | SP |  | Trained technicians from NTTF preferred. For Li-ion battery & SMPS, RJIL will train the trainers. |
| 30 | Security compliance | SP |  | Jio Network Mitra, submission of  Incident Report etc. |
| 31 | Statutory compliance | SP |  | PF, Ptax, ESIC, insurance etc., as applicable |
| 32 | Planned event management | SP | RJIL |  |

### RACI Matrix - P&U (Power & Utility)

**Note: R- Responsible, A - Accountable, C- Consult & I - Information**

| **Domain** | **Activities** | **TRT** | **SP Supervisor** | **Utility Engineer** | **CMP**  **Lead** | **SHQ /**  **NHQ** | **OEM** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Preventive** |  |  |  |  |  |  |
| Access | Access Management / Coordination | R | A |  | C | I |  |
| Site | Hygiene Check (Water seepage, Dust, Rodent, Wastage Etc) | R | A | I |  |  |  |
| Site | Checking of EMF Signage board | R | A | I |  |  |  |
| GBM | Opening and closing of doors including ladder erection | R | A | I | C | I |  |
| GBM | Cleaning of Air Filters | R | A | C |  | I |  |
| ODC | Cleaning of Air Filters | R | A | C | I |  |  |
| ODC | Visual Check | R | A |  | I |  |  |
| ODC | Roxtec Cable Entry check | R | A |  | I |  |  |
| ODC | Checking of FAN operating condition & Noise | R | A | C |  |  |  |
| Battery & SMPS | Checking of Battery & Rectifier | R | A | C | I |  |  |
| Battery & SMPS | LVD Setting check | R | A | C |  |  |  |
| Battery & SMPS | Checking of Battery individual cell voltage | R | A | C | I |  |  |
| Battery & SMPS | Maintenance of DCDB | R | A |  | I |  |  |
| Battery & SMPS | Battery Discharge Test | R | A | C | I | I |  |
| Solar Installation at Cell Sites | Solar equipment's installed at site/ Visibility of equipment's/ Solar Generation Efficiency >80% in all sites | R | A | C | I | I |  |
| Electrical Panel, Energy meter box | Inspection of Panel & energy meter for cleanliness, tightening of connections, etc. | R | A | C | I |  |  |
| Readings of energy meters | R | A | I | C | I |  |
| Earthing system | Checking earth resistance value of earth pit | R | A | C | I | I |  |
| Earthing system | Lightning protection checking | R | A | C | I | I |  |
| Alarm extension to NOC | Checking of Smoke Detector | R | A | C | I |  |  |
| Alarm extension to NOC | Simulation of alarm extension for all Utilities to NOC & E2E alarm  communication assurance | R | A | C | I | I |  |
| Security Alarm System | Checking of security alarms, door locking system / access control | R | A | C | I | I |  |
| Small Cell/ Wi-Fi | Check Earthing & Power cable termination. | R | A | C | I | I |  |
| Civil Works | Visual check on tower & Foundation | R | A | C | I | I |  |
| Civil Works | Minor repair work on mast |  | R | A | C |  |  |
| DG | Supervision of diesel Filling |  | R | A | C | I |  |
| DG | Oil Level Checking | R | A | C | I |  |  |
| DG | Checking of Alarms/ DG Run hr./KWH/ visual checks | R | A | C | I |  |  |
| DG | DG Trial Run/ changeover | R | A | C | I |  |  |
| DG | DG Routine Maintenance |  | A | C | I |  | R |
| DG | DG Major Maintenance |  | A | C | C | I | R |
| Documentation | Documentation & Report preparation |  | R | A | C |  |  |
| Miscellaneous | House keeping around the GBM | R | A | C |  |  |  |
| Miscellaneous | Door Gasket check | R | A | C |  |  |  |
|  | **Others** |  |  |  |  |  |  |
| P&F Management | IEM entry for diesel filled for the day | R | A | I | C | I |  |
| P&F Management | Diesel filling beat plan |  | R | A | C | I |  |
| Audit | Sample audits of sites for ensuring quality OSP works |  |  |  | R | A |  |
| Audit | Inspection of new RFE1 sites. |  |  | R | A | I |  |
| Audit | HOTO of new sites. |  |  | R | A | I |  |
| N/W Stability | Need basis Infra upgradation of sites. |  |  | R | C | I |  |
| P&F Management | Liasioning with EB department | R | A | C | I |  |  |
| Miscellaneous | Liasioning with site Owner | R | A | C | I |  |  |
| Miscellaneous | Co-ordination with OEM for service support within SLA |  | R | C | I |  |  |
| Miscellaneous | SO7 triggering and closure for utility equipment alarm integration |  | R | C | I |  |  |
| Miscellaneous | Zabbix Connectivity & E2E communication |  | R | C | I |  |  |
| Miscellaneous | Equipment fault analysis. | R | A | C |  |  |  |
| P&F Management | EB bill collection and IEM entry | R | A | C |  |  |  |
| N/W Stability | Arrangement of mobile DGs | R | A | C | I |  |  |
|  | **Corrective** |  |  |  |  |  |  |
| Battery & SMPS | Battery fault related to BMS or individual cell |  | A | C | I |  | R |
| Battery & SMPS | SMPS faults |  | A | C | I |  | R |
| Miscellaneous | Spare Parts Management & Repair/Return |  | R | A | C | I |  |

### Telecom Equipment RACI Matrix

| **Domain** | **Activity** | **TRT** | **SP Supervisor** | **L2 RF / L2 BH** | **CMP**  **Lead** | **SHQ / NHQ** | **OEM** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Preventive** |  |  |  |  |  |  |
| RAN/CSS/MW | Check Power card, Earthing & Power cable termination at. (BBU, GPS Arrestor, RRH, CSS, MW ODU) | R | A |  | C | I |  |
| RAN/CSS/MW | Check CPRI cable and Connector at both end | R | A | I | C | I |  |
| RAN/CSS/MW | Check MW ODU Login & Patch cord cable and Connector at both end | R | A | C |  | I |  |
| RAN/CSS/MW | Check MW Antenna Interface with OMT , LOS & Antenna Tightness. | R | A | C | I |  |  |
| RAN/CSS/MW | Check MW Antenna Support rod, Clamps & Pole Mount for proper tightness to hold the antenna position | R | A | C | I |  |  |
| RAN/CSS/MW | Check Backhaul Patch cord and SFP Module at both end | R | A | C | I |  |  |
| RAN/CSS/MW | Check GPS cable and Connector with arrestor. | R | A | C | I |  |  |
| RAN/CSS/MW | Check physical LED status | R | A | C | I |  |  |
| RAN/CSS/MW | Check IF Cable, Jumper cable, Connector and weather proof at both end. | R | A | C | I |  |  |
| RAN/CSS/MW | Check RET cable and Connector at both end. | R | A | C | I |  |  |
| RAN/CSS/MW | Check GPS antenna position for any obstacle. | R | A | C | I |  |  |
| RAN/CSS/MW | Redundancy check (HW/Path/Power) | R | A | C | I |  |  |
| RAN/CSS/MW | FAN filter Cleaning | R | A | I | C | I |  |
| RAN/CSS/MW | Hygiene Check (Water seepage, Dust, Rodent, Wastage Etc) | R | A |  | C | I |  |
| Key Management | Key Management / Coordination | R | A |  | C | I |  |
| Scaffolding / Ladder | Arrange Scaffolding /Ladder to reach to height | R | A |  | C | I |  |
| Miscellaneous | Housekeeping around the GBM / GBT | R | A |  | C | I |  |
| Miscellaneous | Access Liasioning | R | A |  | C | I |  |
| Documentation | Documentation & Report preparation (Fuel Log Book, M Field Log book) | R | A |  | C | I |  |
|  | **Corrective** |  |  |  |  |  |  |
| Tower Climbing & Descending | Tower Climbing & Descending | R | A |  | C | I |  |
| RAN/CSS/MW | Spare Parts arrangement/Return | R | A |  | C | I |  |
| RAN/CSS/MW | HW Reset & Replacement (UAMA, L9CA,GPS arrestor , Surge Arrestor Replacement, CSS  Router & SFP ) | R | A | C | I | I |  |
| RAN/CSS/MW | HW Reset & Replacement (RRH, RF Antenna, GPS Antenna, ODU, MW Antenna, POE ) | R | A | C | I | I |  |
| RAN/CSS/MW | MW Antenna alignment , XPIC Alignment, LOS Check, Antenna Height change | R | A | C | I | I |  |
| RAN/CSS/MW | Alarm Handling and Level 2 Troubleshooting, |  |  | R | A |  | C |
| RAN/CSS/MW | Level3 troubleshooting ( eNodeB / Microwave & CSS) |  |  | R |  |  | A |
| RAN/CSS/MW | WO Updation and Closure | R | A | I | C |  |  |
| RAN/CSS/MW | Wo TECO Confirmation |  |  | R | A | C |  |
| RAN/CSS/MW | Software Upgradation |  |  | R | A |  | C |
| RAN/CSS/MW | Site Audits |  |  | R | A |  | C |
| RAN/CSS/MW | Support Activities (Node visibility/ Local Login) |  | R | A | C | I |  |
| RAN/CSS/MW | Support for Optical & loop break activity | R | A | C | I | I |  |
| RAN/CSS/MW | RAN / MW, Y cable, MW IF Cable, Login Cable, Power Cable, patch cord replacement.  Including VSWR Alarms Jumper cable changes | R | A | C | I | I |  |
| RAN/CSS/MW | Ground support to rigger by tech during tower top activities. | R | A | I | C | I |  |

### RACI Matrix - OFC

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Activity** | **Patroller** | **FRT** | **SP Supervisor** | **Fiber Engineer** | **CMP**  **Lead** | **SHQ / NHQ** | **Third Party** | **Material Coordinator** | **SHQ L&D**  **Trainer** |
| **Preventive** |  |  |  |  |  |  |  |  |  |
| Identification of Vulnerable section of the route due to any infra activities. | R | R | A | C |  | I |  |  |  |
| Identification of low hanging aerial portions, exposed OFC at culvert, bridge etc. open manholes. | R | R | A | C |  | I |  |  |  |
| OTDR Testing of unused fibres on periodic basis |  | R | A | A | C | I |  |  |  |
| Verification of availability & health status of all tools |  | R | A | R | A | I |  |  |  |
| Aerial to Underground |  |  | A | A | C | I | R |  |  |
| Underground to Aerial |  |  | A | A | C | I | R |  |  |
| **Corrective** |  |  |  |  |  |  |  |  |  |
| Receipt of Work order |  | R |  | A | C | I |  |  |  |
| Travel to fault location |  | R | A | A | C | I |  |  |  |
| Identification of fault location |  | R |  | A | C | I |  |  |  |
| Fault Restoration |  | R |  | A | C | I |  |  |  |
| RCA submission |  | R | A | A | C | I |  |  |  |
| Material booking |  | R | A | A | C | I |  |  |  |
| Work order closure |  | R | A | A | C | I |  |  |  |
| Identification of high loss point |  | R | A | A | C | I |  |  |  |
| Carrying out Planned event |  | R | A | A | C | I |  |  |  |
| Updating the new Manhole location & New fibre path if applicable |  | R |  | A | C | I |  |  |  |
| Leased Fiber Monitoring SLA on day to day basis |  |  |  | A | C | I | R |  |  |
| Leased Fiber calculation of SLA KPI on monthly basis |  |  |  | A | C | I | R |  |  |
| **Others** |  |  |  |  |  |  |  |  |  |
| Planned event & splicing |  | R | A | A | C | I |  |  |  |
| Operations of Fibre TMI like OTDR,Splicing Machine, Cable Locator & LSPM to all  engineers,supervisors,splicer & Patrollers |  | R | A |  | A | I |  |  | R |
| Material Issue & Consumption |  |  | A |  | R | A |  | A |  |

# Annexure – VIII: GUIDELINES FOR NETWORK MITRA

Support for Management of Network Mitra by Service Provider for monitoring unmanned sites.

1. **PURPOSE**

The objective of this procedure is to establish guidelines for engagement & management of Network Mitras for effective monitoring / securing of unmanned assets of RJIL.

1. **DESCRIPTION**

The procedure provides guidelines to persons interacting with NM and is applicable to management of Network Mitra for RJIL.

* To define the process of engagement and management of Network Mitra.
* Defining the role of Network Mitra for response to manage potential incidents.
* Define communication protocols.
* To educate and establish guidelines and requirements for surveillance of Network and other assets of RJIL by Network Mitras.

1. **NM MANAGEMENT PROCESS**

NM management process consists of following six steps.

1. Identification of NM
2. Induction of NM
3. Communication
4. Reward / Incentive / Honorarium
5. Usefulness and Validation of NM
6. Checks and Balances
   1. **Identification of NM**

* O&M Lead in coordination with SP shall be overall responsible for the identification and engagement of NM in his area of jurisdiction.
* SP under guidance of O&M Lead / CTO / CSM shall identify potential NM for the area nearby to RJIL assets.
* The list of NMs shall be validated by the respective O&M Leads before finalization.
* The CTO / CSM / O&M Leads and their teams can also recommend any person as NM for their respective states.
* The NM shall be identified based on the criteria mentioned in Annexure – A.
  1. **Induction of NM**
* The O&M Lead of respective MP shall be responsible for engaging, inducting and briefing potential NM in his area of responsibility under guidance of the
* CTO / CSM. O&M Lead may utilize, if required the services of the SP for this purpose.
* The potential NM shall be inducted based on criteria mentioned in Annexure–A.
* NM information shall be recorded by O&M Lead in NM information sheet (Refer Annexure-B) and shall be kept as record. Confidentiality of ‘Network Mitra’ details to be kept – to remain with O&M Lead / CTO / CSM only. No Mitra should know about any other Mitra.
* Updated NM data shall be maintained by NOC, SNOC, O&M Lead, CTO and CSM.
  1. **Communication**
* NOC, SNOC, O&M Lead, CTO and CSM shall maintain land line / mobile / contact numbers / email IDs of all NMs in their respective Areas; for communication with NM. Record of communications with NM to be kept.
* NM shall immediately communicate any useful information directly to SNOC (at Toll Free Number) / OSP NOC / O&M Lead.
* SNOC shall immediately communicate the information to NOC, O&M Lead and SP for necessary preventive measures / actions.
  1. **Reward / Incentive / Honorarium**

The procedure for the payment of Reward / Incentive / Honorarium to Network Mitra will be as under:

* A Reward / Incentive/Honorarium shall be made to NM for a specific event / incident. This Reward / Incentive shall depend upon the usefulness of some important information at the discretion of the CTO. Such Reward / Incentive will be per advance information / act leading to prevention of damage / incident / loss etc. The categorization of the Importance of information is follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr No** | **Category** | **Description** | **Example** |
| 1 | Very Critical | Demonstrated and successful stoppage of a major event which could lead to possible disruption of services or damage of infrastructure | Eg. Service affecting activity like digging by JCB is initiated and NM ensured the activity is stopped & kept on hold till the time O&M Lead or CTO has taken preventive steps to stop the activity completely. |
| 2 | Critical | Proven efforts in stoppage of an event which has commenced | Eg. NM has timely informed O&M Lead  / CTO and has made visible efforts to stop an ongoing activity (digging, road widening etc.) which may lead to damage of our asset. |
| 3 | Useful | Proactive information gained through networking or intelligence and shared  before an event | Eg. NM is aware of upcoming digging activity and same is intimated to CTO / O&M Lead beforehand. |
| 4 | Useful | Providing Information of SEB power supply failure at the site or in the neighborhood / vicinity and coordinating the required activity at site as directed by the O&M Lead which has prevented the outage of the site. | NM has called O&M Lead about power failure in a remote unmanned ILA site having DG ‘Failed to Start’ issue and upon direction of O&M Lead had coordinated with FEO / Technician for switching on the DG manually and prevented outage of the site. |

* O&M Lead shall gather the information / get the inputs of all such NMs useful advance information / act leading to prevention of damage / incident / loss in his area from SNOC/CSM.
* O&M Lead based on merit shall recommend for Reward / Incentive / Honorarium on the basis of the usefulness of information and send his recommendation to CTO for approval.
* CTO shall approve the same and route through O&M Lead/CSM to FC&A for arranging payment through vouchers, obtain the receipt and give a certificate in support of the payment made to the NM in prescribed format. The team of FC&A and IR spread in the state shall jointly make direct voucher payment through imprest account kept under the custody of FC&A. They shall regulate the payment to the NMs and obtain receipts duly certified by them.
* Recipient shall sign at designated place (on the Voucher / Payment Receipt as per Annexure – C) on receipt of payment. This shall be kept with FC&A for records purpose. The entire responsibility for its accounting etc. shall rest with FC&A. All the IR personnel in the state are administratively reporting to FC&A; FC&A may take their help also in ensuring the direct payment.
* Time line for various actions is as under :
  + O&M Lead to inform CTO in writing – Within 1 working day.
  + CTO to decide on veracity of info & communicate approval decision to O&M Lead in writing, with copy to CSM – Within 2 working days.
  + O&M Lead/CSM to inform FC&A in writing about the decision on Reward / Incentive / Honorarium – Within 1 working day.
  + FC&A/IR to pay off the NM – Within 3 working days.
* Provision for Cost of calls which will be made to SNOC / NOC / O&M Lead for passing useful information shall be factored in the honorarium.
  1. **Usefulness and Validation of NM**
* O&M Lead thru SP shall verify the availability of NMs in respective areas. If a NM has shifted from the earmarked location, he shall amend the list of NMs and update NOC, SNOC, CTO and CSM.
* O&M Lead / CSM shall cross check the contact details of NMs and update records maintained at NOC / SNOC and CTO.
* In case NM found indulging in criminal, antisocial or illegal activities, his name should be removed from the NMs list by O&M Lead with immediate effect; with intimation to CTO & CSM.
* In case, NM is not found active (not providing any information for long time/ fails to report incident / damage to RJIL asset several times) his name shall be removed and NMs list shall amended accordingly.
* As NMs have mobiles and most mobiles today have camera, NMs shall be encouraged to have photographs also, if possible.
* Multiple NMs can be utilized for information validation.
  1. **Checks and Balances**

Misuse of the system: The NM may misuse the system of Reward / Honorarium payment by informing an intended / expected damage to RJIL assets by employing his own people to do that damage. He can repeatedly use this method to gain more incentives. A regular checks and balances system needs to be evolved by using preventive vigilance.

1. **Responsibility**

* O&M Lead is responsible for overall engagement & management of NMs.
* O&M Lead, thru SP, shall ensure smooth functioning of the NMs for Monitoring / Securing unmanned sites.
* O&M Lead to ensure that the NMs are engaged, briefed and records are maintained.

1. **MIS**

* Monthly updated contact detail of NM by O&M Lead in 1st week of month (Annexure – B).
* Monthly summary of Honorarium paid to NM by state FC&A in 1st week of month (Annexure – D).

1. **Records and Formats**

* List of NM: Continuously updated and maintained at NOC, SNOC, O&M Lead, CTO and CSM as per Annexure – B.
* Voucher Payment Receipt: Maintained by state FC&A as per Annexure – C.
* Monthly summary of all Honorariums / Rewards paid to NM: Maintained by state FC&A as per Annexure – D.
* Documents Retention duration:

|  |  |  |  |
| --- | --- | --- | --- |
| Sr. No. | Document | Retention Period | Annexure |
| 1 | NM Selection Criteria | Not Applicable | Annexure – A |
| 2 | NM Information Sheet | Not Applicable | Annexure – B |
| 3 | Voucher Payment Receipt | 01 Year | Annexure – C |
| 4 | Summary of Reward / Honorarium to NM | 01 Year | Annexure – D |

**Annexure A - NM Selection Criteria**

NM shall be able to keep the area in his visual range for maximum period, so that imminent damage to RJIL property can be averted.

NM shall have his personal two-way communication equipment. ie. Telephone, Mobile, email ID etc.

The NM shall be a person who is located near RJIL asset. Some of persons belonging to various vocations are listed below, who can be developed and engaged as NM are listed below -

* Landlord.
* Farmers.
* Farm Labors / Supervisors working in nearby farms / construction site.
* Village Patwari, Gram Sewak, etc. belonging to village Panchayat / Local Bodies.
* Electric Lineman.
* Panwallahs, Tea stalls owners, Small Shopkeepers, Vegetable, or fruit Stall owners etc. (say, has a shop for 4 or 5 years).
* Roadside Dhabba owners / workers.
* Roadside Tyre / Puncture repair Shops.
* Village Choukidar.
* Neighbors.
* Housewives.
* Staff / Employees of existing parallel / nearby installations.
* Any other person found suitable for the Task.

**Annexure B - NETWORK MITRA INFORMATION SHEET**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Site / Facility Name** | **Name of NM** | **Complete Address** | **Contact Numbers** | **Occupation** | **Remarks** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

**Annexure C - Voucher / Payment Receipt**

I S/O (Village / Tehsil

/ City ), received with thanks a lumpsum amount of Rs. (Rupees only.)

Signature of the Recipient Date:-...................

Contact Number:-…………………….

**Annexure D - Reward / Honorarium Summary**

**Month: State:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Facility / Site Name** | **Name & Address** | **No. of Useful Information**  **Reported** | **Action Taken** | **Honorarium**  **/ Reward Paid** | **Remarks** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

# Annexure – IX – Automation Tools

Below is a list of automation tools. Updated automation tool list will be communicated periodically as applications are added or upgraded.

| **Sr. No.** | **Name of Tool** | **Purpose of Tool** | **SLA /KPI** | **Penalty** |
| --- | --- | --- | --- | --- |
| 1 | Jio Patroller | Monitor Log, logout timings of patroller.  Monitor Distance patrolled on daily basis on Jio Assigned fiber routes.  Monitor the actions taken on feedback provided by patrollers. | Login, Logout timings of the patrollers  Distance planned Vs Travelled | As per SLA/KPI Annexure III.  Compliance shall be calculated on total Distance planned Vs Travelled on daily basis. In case of travel distance found < Planned it shall be treated as Non-Compliance. |
| 2 | JPW- Jio Partner World | Work order closure compliance.  Monitor timelines for various stages / levels / steps of activities like: Acknowledgement, Travel Start, Travel End, Fault Identification, Fault Rectification, Work Start, Material Reservation, Work Completion.  Root cause analysis. | All activities to be completed as per process including RCA and material reservation.  Compliances at each stage / level / step shall be 100% | As per SLA/KPI Annexure III.  Compliance shall be calculated on WO correctly closed with 100% completion of all stages / levels / steps with quality. |
| 3 | M-Test | Work order closure Compliance.  Monitor Status of Dark Fibre health. | All DARK Fibers in all spans shall be within acceptable health status | As per SLA/KPI annexure I.  Compliance is calculated on number of WO passed the Test with quality. |
| 4 | Zabbix | 1. Zabbix is a remote monitoring tool which polls all required parameters for utility equipment (SMPS, DG, Fuel Cells, Battery modules, inverters, LT Panels etc.) at regular interval. 2. All configured parameters are monitored remotely and are vital for overall network operations. During site commissioning, site is integrated to Zabbix and consistency of all parameters is ensured.   Data hygiene and all parameters communication E2E. | 1. 100% Sites Zabbix integration. 2. Reconnection of disconnected sites within 24 Hrs.   Reconnection of disconnected equipment (DG, SMPS, Battery) within 24 Hrs. | As per SLA/KPI Annexure III.  Compliance as per automated dashboard. |
| 5 | DG & SMPS NOC  Connectivity | Remote connectivity of DG & SMPS is required to ensure sites alarm and parameters flow to NOC & central server. | Reconnection of disconnected SMPS within 24 Hrs. | As per SLA/KPI annexure I.  Compliance as per NOC report. |
| 6 | SO7 | a. Tool to integrate the utility alarms E2E.   1. New DG / SMPS SO7   Compliance for ENB, Small Cell, MFL etc. | 100% SO7 compliance within 7 days of site on Air | As per SLA/KPI annexure I.  Compliance as per SO7 status report. |
| 7 | NE / GIS Updation | To maintain Equipment / Material installed Data Base correctly. | 1. 100% inventory data to be shared for updation with RJIL state PC. 2. Any change in site configuration to be informed with all latest detail to state PC within   24hrs. | As per SLA/KPI annexure I.  Compliance as per NE / GIS report. |
| 8 | IEM Portal | 1. Tool to capture the Energy parameters e.g. Fuel & Energy consumption. 2. High DG CPH or EB CPH   correction.  Ensure ZERO Meter tampering in DG & EB | 1a. 100% DG Fuel entry within 24 Hrs of purchase.  1b. EB Bill collection on time & entry within 24 hrs. - 100% compliance.  2a. Based on load installed at site, monthly energy consumption shall be fixed by RJIL after joint study with SP. If any deviation >10% than the fixed energy, then shall be liable for penalty.  2b. If actual consumption of diesel is more than 5% of standard CPH, then shall be liable for penalty for High CPH.  2c. Rectify high CPH cases within 7 working days; Variance in diesel above standard CPH given by OEM  3a. Rectification within 7 days for DG correction.  3b. EB Meter rectification within 7  working days. | As per SLA/KPI annexure I.  Compliance as per IEM report. |
| 9 | Training Modules for OFC, P&U and ISP via Jio Partner Training App | To impart induction and refresher training to resources (both new and existing) to keep updated & for capability improvement. | Newly inducted to be trained before placing on the job. Need based training to be imparted.  Training Records to be  uploaded within 24 hrs of training. | As per SLA/KPI annexure I.  Compliance as per Training Status report. |

# Annexure – X - Occupational Health & Safety Guidelines

“Safety of person overrides all business objectives” is the HSE policy of JIO. JIO believes that all injuries, occupational illness, Safety Incidents and Environmental Hazards are preventable.

JIO is committed for Carrying out Operations without any harm to employees, contractor employees and to the community. Promote occupational health amongst JIO employees, Contractor employees and associated 3rd party vendor employees. Works towards continuous improvement for environment. Create culture of HSE systems, & practices.

As a part of the O&M Services, The Service Provider must provide safety shoes, safety equipment, materials, and protective devices for their employees and 3rd party resources who are working in the field and providing Services, the cost of such materials shall be borne by the Service Provider. It will be the responsibility of the service provider that the all the field resources shall wear the safety gears at all time when deployed in the field. This is required to make sure that all field resources are safe at the time of deployment.

Going forward when Company/Owner decide to have the uniform for all the field resources, the same will be communicated to the service provider and the cost will be borne by company. The service provider shall ensure that the all the field resources shall wear the uniform at all time when deployed in the field.

To meet above objective, we expect that each of our Service provider partner must fulfil below requirements to establish a sustainable “Health, Safety & Environment Management system”

* 1. Appointment of dedicated HSE&F Officer in every State
  2. Deployment of Resources with Job specific Safety Certification requirement
  3. Medical Test Requirement for Field Resources
  4. Issuance of “job specific PPE” (Personal Protective Equipment) to each resource (Direct/Indirect) deployed in Field
  5. Issuance of need basis PPE (Personal Protective Equipment) to each resource (Direct/Indirect) deployed in Field
  6. Providing Regular & Refresher Safety Training to each resource
  7. Issuance of ISI Marked Full Face Crash Helmet, Riding gears (Knee guard and Elbow Guard) and Fixing of Reflective Sticker on bag pack
  8. Issuance of Insulated Tools
  9. Issuance of First Aid Kit
  10. Safety Audit Management
  11. Safety Culture Building through Daily Toolbox Talk (TBT)/Safety Reward & Recognition Program
  12. Incident reporting & Incident Management
  13. Unsafe Act/Unsafe Condition/Near Miss Incident reporting & Incident Management
  14. Hazardous Wate Management to fulfil Environment Compliance
  15. Statutory Compliance Management
  16. Pre-requisites for Two wheeler
  17. Pre-requisite for Four wheeler
  18. HSE&F Score card

1. **Appointment of dedicated HSE&F Officer in every State**

Service Provider to appoint / deploy one professionally Qualified HSEF officer (having Safety diploma from recognized University and min 3 years of experience in HSE) in Each State.

SP HR should get the HSEF Officer Interviewed by JIO State CTO and State HSE&F Officer before appointment.

Dedicated HSE&F Officer shall co-ordinate following activities according to JIO HSE Management system:

* 1. HSE Training management
  2. PPE Compliance Management
  3. Safety Audit Management
  4. Incident Management
  5. HSE culture building
  6. Reporting of KPI/Safety Performance in State Safety Governance meeting & NHQ Safety Governance meeting

1. **Deployment of Resources with Job specific Safety Certification requirement**

**Appointment of competent resources for work at height activities.**

Service provider to ensure that appointed resources for work at height activities should have requisite WORK AT HEIGHT certification before he is deputed in field for height work activities.

Following matrix to be used for giving “JIO Specific Work at Height (JBTH)” training & Certification.

|  |  |  |  |
| --- | --- | --- | --- |
| Sr No | Role | JBTH Training | Rescue Training |
| 1 | Rigger | √ | √ |
| 2 | IBS Technician cum Rigger | √ | √ |
| 3 | Technician | √ |  |

The training is to be conducted through RRPMSL approved third party training agency/vendor

1. **Medical Fitness Requirement for Field Resource**
2. Service provider to ensure that every resource should undergo Medical Fitness Test as per below Matrix:

|  |  |  |  |
| --- | --- | --- | --- |
| Sr No | Role | Pre-Employment Test | Periodic Medical Test |
| 1 | Rigger | **√** | During renewal of JBTH Certification |
| 2 | IBS Technician cum Rigger | **√** | During renewal of JBTH Certification |
| 3 | Technician | **√** | During renewal of JBRH Certification |
| 4 | Other Roles | **√** | - |

1. It is the responsibility of SP HSEF Officer to
2. Keep track and monitor Pre-Employment and Periodic Medical Test of all resources as per defined frequency and Test requirement.
3. Ensuring Medical Fitness Certificates to be uploaded in SCRUM against for each resources.

**Fitness Test Requirement for SP Roles-**

|  |  |  |
| --- | --- | --- |
| For Other Roles | | For Roles Involved in Work at Height Activities |
| Type of Test | Test to be Carried Out | Test to be Carried Out |
| Physical Assessment | 1. Height | 1. Height |
|  | 2. Weight | 2. Weight |
| Investigation: | 1. BP | 1. BP |
|  | 2. Diabetic | 2. Vertigo (height phobia) |
|  | 3. Vision Test | 3. Diabetic |
|  | 4. Hearing Test | 4. Vision Test |
|  | 5. Breathing Test | 5. Hearing Test |
|  | 6. Limb Mobility | 6. Breathing Test |
|  |  | 7. Limb mobility |

1. **Issuance of Job Specific PPE (Personal Protective Equipment) to each resource ( Direct/Indirect) deployed in Field /Site/Facility/Fiber Route**
2. Service provider to provide mandatory Job Specific PPE’S not limited to as indicated in table below to each Direct/Indirect resource deployed in field. The PPEs should be provided as per JIO specification on First day of joining.
3. It is the responsibility of SP HSEF Officer to
4. Keep on Procuring job specific PPE on rolling basis as per Circle Requirement, distribute Job Specific & Need Basis PPE to each Direct/Indirect employee deployed in field.
5. Ensuring usage of PPE by each resource ( Direct/Indirect) accessing the site /Fiber Route
6. Replace PPE, if found damaged during inspection/audit
7. Track, monitor & Replace expired / damaged PPE on regular basis

**Job role wise PPE matrix along with matrix:-**

| Funct ion | Job Role | Safe ty Hel met | Safe ty Gog gle | Reflective Jacket | Safety Shoes | Cott on Han d gloves | Electrical Hand glove s – Class  00 \* | Electrical Hand glove s – Class  0 \* | Electrical Hand glove s - Class  1, 2 | Full Body Harn ess | Work Position Lanyard | Fall Protection gears |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Utility | Technician | √ | √ | √ | √ | √ | √ | X | X | √\*( map ped to GBM  site) | √\*( mapped to GBM site) | X |
| Utility | Rigger | √ | √ | √ | √ | √ | √ | X | X | √ | √(mapped to RTT/RTP  /ESC  Sites) | √( As applicable- Alu Rail/Rop e Grab/Hig hstep  shoe) |
| Utility | IBS Supervisor | √ | √ | √ | √ | √ | X | X | X | X | X | X |
| Utility | IBS Technician cum Rigger | √ | √ | √ | √ | √ | X | √ | X | √ | √ | X |
| Utility | IBS Engineer | √ | √ | √ | √ | √ | X | X | X | X | X | X |
| Utility | Utility Supervisor | √ | √ | √ | √ | √ | X | X | X | X | X | X |
| Facili ty | Large Facility Technician ( ELE) | √ | √ | √ | √ | √ | X | √ | X | X | X | X |
| Facili ty | Large Facility Technician  ( RAC) | √ | √ | √ | √ | √ | X | √ | X | X | X | X |
| Facili ty | Large Facility Supervisor | √ | √ | √ | √ | √ | X | √ | X | X | X | X |
| Fibre | Fibre Engineer | √ | √ | √ | √ | √ | X | X | X | X | X | X |
| Fibre | Fibre Supervisor | √ | √ | √ | √ | √ | X | X | X | X | X | X |
| Fibre | Splicer | √ | √ | √ | √ | √ | X | X | √\*( to be kept in FRT  vehicle) | √\*( to be kept in FRT  vehicle) | √\*( to be kept in FRT vehicle) | X |
| Fibre | Assistant Splicer | √ | √ | √ | √ | √ | X | X | √\*( to be kept in FRT  vehicle  e) | X | X | X |
| Fibre | Patroller | √ | √ | √ | √ | √ | X | X | X | X | X | X |
| FTTX | FTTx  Engineer | √ | √ | √ | √ | √ | √ | X | X | X | X | X |
| FTTX | FTTx  Supervisor | √ | √ | √ | √ | √ | X | X | X | X | X | X |
| FTTX | FTTx  Splicer | √ | √ | √ | √ | √ | X | X | X | X | X | X |
| FTTX | FTTx  Technician | √ | √ | √ | √ | √ | √ | X | X | √ | √ | X |
| Others | Other Supportive Role in Field (Manager/ Labor  /Helper  /Fuel Filler) | √ | √ | √ | √ | √ | X | X | X | X | X | X |

1. **Specification of PPE**:- PPE should be provided to each Resource as per Specification in Table below. SP team may ask for Specification from JIO , if something is missing in this list.

| **Type of PPE** | **Material** | **Design Standard** |
| --- | --- | --- |
| Safety Helmet | HDPE | IS 2925 : 1984 /EN: 397 /ANSI :Z89 |
| Safety Shoes | Upper Leather - Fine Genuine 2 Mm Thickness Grain Leather – Black Colour  Alloy Steel Toe Cap for Complete Toe Protection | EN 345-1/BS EN ISO 20345 - CE Certified  and meeting the requirements of IS 15298  :2002 Part 2 |
| Safety spectacles / Over  spectacles | Clear Poly Carbonate | EN: 166, 167,168 & 170 |
| Electrical Hand gloves - Class 0 | Composite Natural Latex Rubber | EN:60903:2003 |
| Full Body Harness | **Textile Components**  Webbing material: Polyester Width: 43-45 mm Breaking strength : Min 25 kN Thickness of strap:- 3mm Stitching thread: Polyamide(Black & Green  color)  **Metal Components** Material: High Strength steel Plating: Zinc plated  Finish : Deburred & polished | Confirms to EN 361:2002 & EN 358: 1999 (Harness)  Conforms to EN 355 : 2002 (Lanyard) |
| Electrical gloves - Class 1, 2 | Composite Natural Latex Rubber | EN:60903:2003 |
| Arc Flash Suit - 8 Kcal | FABRIC COMPOSITION - | ASTM F2621, IEC61482, ASTM F1959 &  meet the standard of NFPA 70E. |
| Inherent flame retardant (220g/m2) |
| 65% Mod acrylic |
| 33% Meta-Aramid or Para-Aramid |
| 2% Antistatic fiber |
| Arc Flash Suit - 20 Kcal | FABRIC COMPOSITION - | IEC61482, ASTM F1959 & meet the standard of NFPA 70E. |
| Inherent flame retardant (360g/m2) |
| 65% Mod acrylic |
| 33% Meta-Aramid or Para-Aramid |
| 2% Antistatic fiber |
| Gum Boot | Rubber with Fiber composition | Gum Boot: - IS 15298, Toe Cap: IS 5852 |
| Knitted Cotton Gloves | Seamless Knitted 100%Cotton | EN420 |
| Earplug | Sponge/Foam | Conforming to ANSI /Approval S3.19-1974 |
| Dust Mask | Two layers non-woven fabric | BIS 9473-1980 |
| Fall Protection Gears - Rope Grab | Rope Grab : Stainless Steel Grade 316 | EN 353-2:2002 |
| STEEL SCREW LOCKING KARABINER (PN 112) : High  Strength Alloy Steel |
| EXTERNAL ENERGY ABSORBER {PN 600 (S)} : Tear  Webbing : Nylon |
| , Back up Webbing : Polyester |
| Fall Protection Gears - Alu Trolley | SS 316 | EN 353-1:2014 |
| Fall Protection Gears- High step shoes/HIGHSTEP EASY along with High Step  Protector(trolley) | As per HighSetp Norms | As per HighSetp Norms |

1. **Issuance of need basis PPE ( Personal Protective Equipment) to each resource ( Direct/Indirect) deployed in Field /Site/Facility/Fiber Route**

Service provider to provide Need basis PPE to each resource ( Direct/Indirect) deployed in Field/Site/Facility/Fiber Route as per below matrix and ensure PPE usage in field by every resource while at job.

|  |  |  |  |
| --- | --- | --- | --- |
| PPE | To be issued to Resources | Need/Situation | Purpose |
| GUM Boot | Each Resource ( Direct/Indirect) | WaterLogged site/Route/Flood Prone  area/Monsoon Season | To Protect from Snakes, Electrocution etc. |
| Raincoat | Each Resource ( Direct/Indirect) | WaterLogged site/Route/Flood Prone area/  Monsoon Season | To Protect from Rain/Water |
| Umbrella | Each Resource ( Direct/Indirect) | Monsoon Season | To Protect from Rain/Water |
| Earplug, with cord | Each Resource ( Direct/Indirect) | Working on HVAC/DG Set | To protect from High Noise |
| Dust Mask | Each Resource (  Direct/Indirect) | Excavation/Soil filling activity | To protect from Dust |

**Note –** In-case SP team fails to provide mandatory /need base PPE within 15 days ( date of joining of resource or observed as gap/substandard quality during audit or replacement against damage/lost) RRPMSL has right to provide the PPE and debit the cost from SP.

1. **Providing Regular & Refresher Safety Training to each resource**
2. Dedicated HSE&F Officer to ensure
   * 1. Impart Job Specific Safety training to each resource to make him/her aware of Safety Hazards and preventive methods

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sr No | Training | Applicable resources | Training Frequency | |
| First Time | Refresher |
| 1 | HSE Induction Training | All resources | Before onboarding in  SCRUM | NA |
| 2 | Defensive Driving | Resources using Two wheeler  during commuting to work | Within one month of  onboarding | Every Six  Month |
| 3 | Electrical Safety | Resources working on or near  live Electrical Connections | Within one month of  onboarding | Every Six  Month |
| 4 | Working at Height | Resources involved in Height  work activities | Within one month of  onboarding | Every Six  Month |
| 5 | Risk associated with Site  near Proximity of HT/LT Connection | Resources involved in work  activities on sites near to proximity of LT/HT Connections | Within one month of onboarding | Every Six Month |

* + 1. Completion of HSE&F induction & Safety training by each SP resources before on-boarding
    2. Availability of resources for classroom Safety trainings to be given by JIO Team . ( SP HSEF Officer is expected to follow Training Schedule /Calendar published by JIO HSEF Officer)
    3. Training Effectiveness check of 100% resources every Quarter and monitor Failure cases for retraining

1. Carrying out regular check for Training Effectiveness
2. Service provider to ensure that every Supervisor should carry out Training Effectiveness Check for each of his Field Resource once in Quarter for all HSE Trainings
3. SP HSEF Officer has to track, Monitor and ensure 100% compliance
4. Refresher training is to be arranged for resources within 15 days by SP HSEF Officer who have been declared fail in Training Effectiveness check
5. **Issuance of ISI Marked Full Face Crash Helmet , Riding gears (Knee guard and Elbow Guard) and Fixing of Reflective Sticker on bag pack**
6. Service provider to ensure that every resource who is using two wheeler for commuting to site/Fiber Route/ Field work must be issued and should use

* ISI Marked Full face crash helmet
* Riding gears (Knee guard and Elbow Guard) ,
* Reflective Sticker on bag pack

1. Crash Helmet issued to each resource to be numbered and details to be uploaded in SCRUM. Details of helmet, riding gears are given in below table.

|  |  |  |
| --- | --- | --- |
| Sr No | Items | Photos |
| 1 | ISI Marked Crash helmet along with PPRJ Code and reflective Sticker | A black helmet with blue and orange arrows  Description automatically generated |
| 2 | Reflective Sticker on bike (Front/Back side) | A close-up of a motorcycle  Description automatically generated A person on a motorcycle at night  Description automatically generated |
| 3 | REFLECTIVE Cover on Backpack for resource using Two-wheeler | A person on a motorcycle  Description automatically generated |
| 4 | Protective riding gear(Knee guard and Elbow Guard) for resource using Two- wheeler | A person sitting on a motorcycle  Description automatically generated |

1. **Issuance of Insulated Tools**
2. Service provider to provide Insulated Tool Kit to all resources working on Electrical System to protect them from electric shock and to avoid short circuits between two parts at different potential.

Insulated Tools should confirm to the specifications / acceptance tests as mentioned in Indian Standards IS 13772:2021 / IEC 60900:2018.

1. **Issuance of First Aid Kit**

Service provider to ensure that every resource working in Field to be given First Aid Kit with following Min Items:

1. Roller Bandage (2x5.0 cm)
2. Antiseptic Solution (1 Bottle)
3. Wound Cleaner (4 Nos)
4. Gauze Swab Large (2 Nos.)
5. First Aid Dressing (10 Nos).

Dedicated HSEF Officer to track compliance and ensure timely replacement of expired items on regular basis latest in 7 days’ time

**Note –** In-case SP team fails to provide ISI-Full Face Crash helmet/Two -wheeler Riding Gear/ Insulated Tool Kit/First Aid box as per above requirement within 15 days ( date of joining of resource or observed as gap/substandard quality during audit or replacement against damage/lost ) RRPMSL has the right to provide the same and debit the cost from SP

1. **Safety Audit Management**
2. JIO Team is doing regular health checkup through following audit/Inspection:

* PPE Quality & PPE Usage Audit
* Bike Inspection Audit
* Safety Harness Audit
* FRT Vehicle Audit
* ENB Process Assurance Audit
* Safety Process Assurance Audit

1. Dedicated SP HSE&F Officer to ensure following:
2. Track , Monitor & resolve all identified gaps observed in these above audits
3. Resolution of Punch Points strictly as per defined SLA by JIO team
4. **Safety Culture Building through Daily Tool Box Talk ( TBT)/Safety Reward & Recognition Program**
5. Daily Tool Box Talk ( TBT):
6. Service Provider is expected to bring Safety Awareness through Daily Tool Box Talk and create a culture where in Every Supervisor deliver at least One Tool BOX talk in a day before start of work by Field Resources.
7. Dedicated SP HSE&F Officer to
   * + - Track & Monitor Daily TBT Compliance from each Supervisor
       - Monitor participation by each resource in daily Safety Tool Box Talk done by SP Supervisor
8. Reward & Recognition Program
9. Service Provider should plan and arrange Safety Reward & Recognition program every month in State as per JIO guidelines and recognize Safety Champions
10. Dedicated SP HSE&F Officer to ensure following-
    * + - Every Month at least min one R&R Program should get conducted in State
        - During one financial Year all Maintenance locations should get covered
        - Records of each R&R program to be captured in PPT format and to be submitted on or before of 10th day of each month to JIO HSE&F Officer
11. **Incident reporting & Incident Management**

Service provider to ensure Timely reporting of Fire/asset damage/injury related incident to JIO team, support in investigating of Incident & get the same concluded jointly with JIO Team.

Dedicated SP HSE&F officer to ensure following actions

* Report all work OR non-work related incident and injuries immediately to State HSE&F officer
* Provide relevant Evidences/ facts/ finding against Incident
* Drive and ensure closure of corrective and preventive actions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sr No | Action/Information Required | SLA | Time Period | To Whom | By Whom |
| 1 | Information about First cut information(Incident brief-Date, Time, Location /Injury brief/Name, PPRJ, Role of person/MP on mail  /WhatsApp group. | 4 hrs | Same day of Incident | JIO State HSE&F Officer | SP State HSE&F Officer |
| 2 | Submission of First Cut RCA of Incident   1. how the incident happened, 2. what went wrong, 3. what are the lapses resulting into incident , 4. immediate action taken etc., 5. Conclusion of Work Related/Non   Work related | 3 days | from 3rd day of Incident | JIO State HSE&F Officer | SP State HSE&F Officer |
| 3 | Analysis of Inputs and suggestion received by all Stakeholder | 2 days | from 5th day of Incident | JIO State HSE&F Officer | SP State HSE&F Officer |
| 4 | Submission of Final Investigation Process | 1 day | From 6th Day of Incident | JIO CTO,  State HSE&F Officer, NHQ Tower/Fiber Head, NHQ HSE&F Team | SP State Head/State HSE&F SPOC |

1. **Unsafe Act/Unsafe Condition/Near Miss Incident reporting & Incident Management**
2. Unsafe Act and Unsafe Conditions are Leading Indicators of HSE&F Management System. Service provider to ensure that every Unsafe Act/Unsafe Condition/Near Miss Incident should be reported by Field Resources to his immediate supervisor, who in turn report UC/UA/Near Miss Incident to JIO CMP Team.
3. Service provider to create a system where in Field Resources take immediate corrective /Preventive actions against every Unsafe Act/Unsafe Condition/Near Miss Incident and share evidences with JIO CMP Team post resolution latest in 7 days’ time
4. Dedicated HSE&F Officer should ensure compliance of above guideline and shall monitor for Corrective Action/Preventive Actions to avoid repetition of Unsafe Act and Unsafe Condition in Field Operations
5. **Hazardous Wate Management to fulfil Environment Compliance**

Service Provider to ensure and implement Used /Waste Oil Management as per below practices:

1. Field Resources ( Technicians) should take out Waste/used oil from DG post PM activity and shift the same to designated Hazardous Waste collection center/Storage Location in the MP on same day
2. Technicians should get the entry completed in Record Register for delivered Waste oil at Storage location
3. Dedicated HSE&F Officer should ensure compliance of above guideline from each Technicians and should keep a record of Used oil delivery at designated store locations. He should provide details to JIO HSEF Officer on last day of every month.
4. Dedicated HSEF Officer should help/support in disposal of used oil to authorized vendor from each storage location.
5. **Statutory Compliance Management**

Service Provider to ensure and implement Statutory Compliance Management at each tower site/facility as per below practices

1. Service Provider to direct each field resource to ensure availability of EMF signage on Tower as per DOT Regulation and availability of Danger Signages on Electrical Equipment (DG, ODC, Entry Point of Transformer) at all times
2. Every Technician should keep extra EMF and Danger signage’s in his bag.
3. Whenever Technician is visiting site for doing PM, he should check for EMF Signage & Danger Sign availability at site/equipment and fix the same if found missing.
4. Technician should capture the evidence of EMF Signage/Danger Sign in JPW mobile application while executing PM Work Order
5. Dedicated HSE&F Officer should ensure compliance of above guideline from each Technicians
6. **Pre-requisites for Two wheeler**

Service Provider to ensure following pre-requisite conditions of two wheelers used by each resources while commuting to work -

1. Resource must have valid Driving License
2. Vehicle Registration certificate and Valid Vehicle Insurance Certificate should available
3. Road Worthy Conditions of Vehicles
   1. Good condition of Head light and indicating lamps
   2. Good Condition of Tyres
   3. Good Condition of Both the rear view mirror
   4. Good Condition of brakes, clutch
   5. Bike Reflective sticker is pasted on Front and Back side
4. Dedicated HSE&F Officer should ensure compliance of above guideline from each resources using two wheeler
5. **Pre-requisite for Four wheeler**

Service Provider to ensure following pre-requisite conditions of four wheelers used by Field for O&M work

1. Deployment of Utility SUV vehicle for Field work
2. Vehicle should be Commercial-Registered along with valid Insurance and Fitness certificate
3. Vehicle must road worthy condition (Indicators, clutch, brake, tyre, mirror)
4. Safety Do's Don'ts displayed in Vehicle
5. Vehicle must equipped with Seat belt First aid box along with valid items, Fire extinguisher ,Road barricades, sign boards and traffic cones
6. All the tools available in tool kit are insulated
7. Driver must having Valid driving license along with min 3 years of driving experience
8. Defensive driving training done for Driver before deploying vehicle in field
9. Dedicated HSE&F Officer should ensure compliance of above guideline
10. **HSE&F Score card:**

JIO Team shall be releasing SAFETY SCORE Card of each Service Provider basis performance of SP team on above activities every month. Scoring Methodology shall be released by JIO NHQ HSE Team on time to time basis, which shall be adhered to by each SP.

# Annexure – XI - Reliance Group Business Partner Code of Conduct (BPCOC)

1. **PURPOSE**

At Reliance, our Business Partners are critical stakeholders in our success and we are committed to strengthening our relationship with them.

**Reliance Group** (which includes Reliance Industries Limited, its subsidiaries and affiliates and joint ventures) gains its competitive advantage through strong performance by leveraging its competencies - reliability, quality and flawless execution in a timely and safe manner. We work with Business Partners who share these beliefs and competencies.

Reliance’s **Business Partner Code of Conduct** (“**BPCOC**”) articulates our expectations from our Business Partners with respect to ethical, compliant and safe conduct of business throughout the course of our business relationship.

Reliance values Business Partners who join us in pursuing these common goals and adopt practices that are consistent with BPCOC.

1. **SCOPE**

BPCOC applies to all current and potential Business Partners of **Reliance Group** including, but not limited to, customers, suppliers (of services and products), landlords / lessors, lessees, intermediaries, consultants, agents, representatives and distributors.

1. **INTEGRITY AND COMPLIANCE WITH LAWS**
   1. **Business Integrity**

We expect our Business Partners:

* + 1. To not tolerate, permit, or engage in bribery, corruption, embezzlement, extortion, kickbacks, inducements or any other unethical practices.
    2. To not offer any money or anything of value directly and/or indirectly to the employees of Reliance Group or persons representing Reliance in any way.
    3. To not get involved in money laundering activities in any manner.
    4. To follow fair practices to earn our business and not to indulge in any anti-competitive or unfair/restrictive trade practices in any form.
  1. **Conflict of Interest**

We expect our Business Partners:

* + 1. To be aware of the many different ways in which conflicts of interest can occur.
    2. To avoid any situation that may involve a conflict between Business Partner’s personal interest and the interests of Reliance Group.
    3. To disclose any actual or apparent conflicts of interest including but not limited to relationships or association with any existing / past employees of Reliance Group or their immediate family members.
  1. **Confidentiality and Protection of Reliance Property**

We expect our Business Partners:

* + 1. To use Reliance assets, including any equipment, materials, IT assets, for defined purposes only.
    2. To comply with obligations relating to non-infringement, restricted use, secrecy and non-disclosure of Reliance’s confidential information and intellectual property as per the applicable agreements with Reliance.
    3. To promptly report any security breaches or incidents that may affect the confidentiality of any Reliance provided information.
    4. To strictly adhere to the provisions of “No disclosure agreement (NDA)” wherever applicable.
  1. **Data Protection and Privacy**

We expect our Business Partners:

* + 1. To comply with all applicable laws relating to collection, processing and transfer of personal and personally identifiable information in the jurisdictions of their operations.
    2. To implement appropriate information security systems and processes and report any incidents of violation or disclosure of confidential or personal data.
    3. To handle and process data only for the purpose(s) mentioned in the agreement with Reliance.
    4. To strictly avoid usage of unapproved messaging platforms for business communication involving any commercial transactions.
  1. **Social Media**

We expect our Business Partners:

* + 1. To ensure that posts on social media (including by their employees) are legally compliant and made in a responsible manner.
    2. To not post confidential or proprietary information of Reliance in public domain.
    3. To not post derogatory, defamatory, inflammatory, disrespectful, obscene, threatening, abusive or malicious content about Reliance Group and / or its shareholders, promoters, directors, officers or employees.
  1. **Ethical Sourcing of Materials**

We expect our Business Partners:

* + 1. To use reasonable diligence with respect to sourcing of materials to execute Reliance orders.
    2. To ensure that such sourcing neither promotes/supports counterfeiting nor benefits private or other groups that perpetrate human rights abuses and create violent conflict.
    3. To take Reliance's prior consent in case any of the work of Reliance needs sub- contracting or out-sourcing.

1. **LABOUR PRACTICES**
   1. **Employment**

We expect our Business Partners:

* + 1. Not to employ child labour.
    2. Not to employ people against their own free will (forced labour).
    3. To provide a workplace that is free from harassment, intimidation or any form of sexual harassment.
    4. To prevent discrimination in hiring and employment practices against any employee based on race, color, caste, creed, age, gender, sexual orientation, ethnicity, disability, etc.
    5. To comply with all applicable laws and regulations relating to employees and workers including laws on wages, working hours and labour conditions and not engage in any activity prohibited by law such as slavery or human trafficking.

1. **HEALTH, SAFETY AND ENVIRONMENT**
   1. **Occupational Health and Safety**

We expect our Business Partners:

* + 1. To provide a healthy and safe working environment for their employees, contractors, partners and others who may be affected by their activities.
    2. To ensure compliance with all applicable health and safety standards and obligations.
    3. To ensure that all safety related preventive systems are in operational preparedness at all times through appropriate drills, audits, etc.
  1. **Environmental Stewardship**

We expect our Business Partners:

* + 1. To uphold the core values of environmental protection and conservation and conduct business in an environmentally sensitive way.
    2. To operate in a manner such that any environmental impact of their designs, products, services, manufacturing processes is minimized.
    3. To encourage adoption of sustainable solutions where possible.
    4. To comply with relevant environmental legislation and international conventions and standards.

1. **COMPLIANCE**
   1. **Communication and Awareness**

We expect our Business Partners:

* + 1. To clearly communicate the requirements of this BPCOC and how it translates into business practices and operations to all its employees and business partners.
    2. To internalize and institutionalize the standards of business practices and operations as set forth in this BPCOC.
  1. **Certification**

We expect our Business Partners:

* + 1. To have an authorized representative to certify that he/she has read this Code and commits the Business Partner to these standards and to provide certifications from time to time confirming compliance with this Code.
  1. **Disclosures and Reporting Violations**

We expect our Business Partners:

* + 1. To promptly disclose to Reliance any actual or suspected incidents of violations of this Code, whether by any of its own or Reliance’s employees, in good faith, and on a confidential basis, to Ethics & Compliance Task Force at [Ethics.Taskforce@ril.com](mailto:Ethics.Taskforce@ril.com).
    2. To cooperate with and provide assistance to Reliance in conducting inquiries, investigations into any past or current incidents or activities that could potentially be in violation of this Code.
  1. **Implications for Non-Compliance**

Failure to comply with the standards set forth in this BPCOC or non-implementation of any corrective measures will entitle Reliance to:

* + 1. Notify appropriate authorities or regulators, and/or
    2. Suspend and/or terminate the agreement executed with the Business Partner with immediate effect, and/or
    3. Take suitable action including appropriate legal action at the sole discretion of Reliance.