As Per the Schematic drawings the contents in this Test format can be modified

Note: The following should be done before starting the activity

1**.** Approved commissioning copy schematic drawing shall be pre-checked.

2**.** All secondary injection and all components tests shall be completed and witnessed.all test results

must be available and signed.

3**.**  Auxiliaries, timers, contactors, pulse units, annunciators, MCB’s … etc.

4.All final settings shall be applied and signed

# **GENERAL DATA AND INFORMATION:**

# 

|  |  |
| --- | --- |
| Panel designation |  |
| Manufacture |  |

1. **MECHANICAL CHECK AND VISUAL** **INSPECT** As per TCS–P-105 Rev - 1, Item no 4.1

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Description | Checked | |
| 1 | Check tightness of all connections | ❑Yes | ❑N/A |
| 2 | Inspect for physical damage / defects | ❑Yes | ❑N/A |
| 3 | Panel condition, cleanliness, organization, labeling, readiness for service, panel doors, handles...etc | ❑Yes | ❑N/A |
| 4 | CT shorting checked | ❑Yes | ❑N/A |
| 5 | Indications checked | ❑Yes | ❑N/A |
| 6 | Contact resistance of tripping and alarm checked | ❑Yes | ❑N/A |
| 7 | Check the ferrules as per specification | ❑Yes | ❑N/A |
| 8 | Confirm that each panel has been properly secured to the floor in its final service location. | ❑Yes | ❑N/A |
| 9 | Confirm that panels are constructed and wired as per SEC relevant specification. | ❑Yes | ❑N/A |
| 10 | Panel earthing checked | ❑Yes | ❑N/A |
| 11 | Check case cover and gasket for proper seal against dust. | ❑Yes | ❑N/A |
| 12 | Check all installed equipment nameplate information for compliance to approved drawings and equipment /material lists. | ❑Yes | ❑N/A |
| 13 | For all internal and external panel wiring, confirm that all screw terminations are tight and that crimp connectors are firmly secured to the wire and to the termination point. Ensure that no part of the wire is bent at the termination point. Check Ferrules. | ❑Yes | ❑N/A |
| 14 | Check that panel equipment is mounted securely and protected against mal operation due to vibration, shock, etc | ❑Yes | ❑N/A |
| 15 | Use of ring type terminals for wire termination for current circuit wires. | ❑Yes | ❑N/A |

1. **GENERAL FUNCTIONAL CHECK** As per TCS–P-105 Rev - 1, Item no 5.1

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Description | Checked | |
|  | Check Output Of 127v Ac Outlet | ❑Yes | ❑N/A |
|  | Check Output Of 220v Ac Outlet | ❑Yes | ❑N/A |
|  | Check Function Of Illumination Lamp | ❑Yes | ❑N/A |
|  | Check Function Of Door Switch | ❑Yes | ❑N/A |
|  | Check Function Of Heater | ❑Yes | ❑N/A |

1. **D.C. LOOP:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S no | Measuring points in MCB | X ---- : ---- , --- | | X ---- : ---- , --- | | X ---- : ---- , -- | | X ---- : ---- , --- | |
| 1 |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Protection operated | Relay panel ----------- | | | | Control panel -- | | Fault Recorder | | IT Send | CB operation | | FMK - | Remarks |
| Trip relay | CBF start | IT send | Ind /flag Relay | CH | Alarms | CH | Event | 85 S/R | Trip | Close  Block | T.B |
| 87 C cable diff prtn optd | 86 PW | 50 / 62 BF | 85 S/R | 87 C | CH -- | Main prtn optd | FR ---- | FMP optd | -------- | TC 1 | --------- | X--:--,- | Check close LK |
| 86 PW | CH ---- |
| 51 /51N BK up O/C + E/F prtn | 86 BU | 50 / 62 BF | 85 S/R | 51 / 51 N | CH - | Bk up prtn optd | FR ---- | O/C + E/F prtn optd | ------- | TC 2 | --------- | X--:--,- | Check close LK |
| 86 BU | CH ---- |
| IT Rcv 85S/R | ------ | 50 / 62 BF | ------ | 85 S/R | CH - | IT RCV optd | FR ---- | IT Rcv 85 S/R | ------- | TC 1 &TC2 | --------- | X--:--,- | ----------- |
| -------- | CH ---- |
| 50 / 62 BF prtn | 86 RTR | 50 / 62 BF | 85 S/R | 50/62 BF | CH -- | CBF prtn optd | FR ---- | CBF prtn optd | ------- | TC 1 &TC2 | -------- | X--:--,- | Check close LK |
| 86 B | 86 RTR | CH ---- |
| 86B B/B prtn trip | 86 B | 50 / 62 BF | 85 S/R | ---------- | -------- | --------- | ------ | --------- | --------- | TC 1 &TC2 | -------- | X--:--,--- | Switch (in/out)  “out”  Position |
| 86B | ------ |
| 86B B/B prtn trip | 86 RTR | 50 / 62 BF | 85 S/R | 86 RTR | -------- | --------- | ------ | --------- | --------- | TC 1 &TC2 | -------- | X--:--,- | Switch (in/out)“in”  Position |
| 86 B | 86 B | ----- |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Event | Relay panel  ------ | Control panel  ------- | | FMK  ---- | Remark | Function as expected |
| IND / Flag relay | Channel | Alarms | TB |
| Breaking path of supervision circuit R1 | 74 R1 | CH ---- | Main protection faulty | X ----: ----.-- |  | ( ) Yes |
| R1 DC supply fail | Inter Trip Send /  Rcv Faulty |
| Breaking path of supervision circuit R2 | 74 R2 | CH ---- | Back up prot  Faulty | X ----: ----.-- |  | ( ) Yes |
| R2 DC supply fail |
| Breaking path of supervision circuit IT | 74 IT | CH ---- | Inter trip DC supply failed | X ----: ----.-- |  | ( ) Yes |
| IT DC supply fail |
| Breaking path of supervision circuit CBF | 74 BF | CH ---- | CBF protection  faulty | X ----: ----.-- |  | ( ) Yes |
| CBF DC supply fail |
| Breaking path of supervision circuit TC 1 | 74 TC1 | CH ---- | Trip circuit -1 faulty | X ----: ----.-- |  | ( ) Yes |
| Trip ckt -1 faulty |
| Breaking path of supervision circuit TC 2 | 74 TC2 | CH ---- | Trip circuit -2 faulty | X ----: ----.-- |  | ( ) Yes |
| Trip ckt -1 faulty |
| Relay Reset supply TRS | 74 TRS | CH ---- | Control supply failed | X ----: ----.-- |  | ( ) Yes |
| Trip ckt – 2 faulty |
| Relay Indication supply IC | 74 IC at ------ | CH ---- | Control supply failed | X ----: ----.-- |  | ( ) Yes |
| Indication supply | CH ---- | Control supply failed | X ----: ----.-- |  | ( ) Yes |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Event | Relay panel ------ | Control panel ------- | | FMK ---- | Remarks | Function as expected |
| IND / FLAG relay | Channel | Alarms | TB |
| Optical cable system failed | 87 C /85 S/R | CH ---- | Optical line system failed | X ----: ----.--- | Remove fiber optic cable | ( ) Yes |
| CH ---- | Main protection faulty  Inter trip send/Rcv faulty |
| Main protection faulty | 74 R1 | CH ---- | Main protection faulty | X ----: ----.--- | MCB off | ( ) Yes |
| Inter trip send/Rcv faulty |
| 51 / 51N faulty | 74 R2 | CH ---- | Back up protection  Faulty | X ----: ----.--- | MCB off | ( ) Yes |
| IT send relay DC off | 74 IT | CH ---- | Inter trip dc supply faulty | X ----: ----.--- | MCB off | ( ) Yes |
| CBF protection faulty | 74 BF | CH ---- | Cbf protection faulty | X ----: ----.--- | MCB off | ( ) Yes |
| Synchro check relay faulty | Closing LCC supply off | CH ---- | Synchro check relay  Faulty | X ----: ----.--- | -------------- | ( ) Yes |
| Switch off DC supply fail MCB R1 | R1 DC supply fail | CH ---- | Main protection faulty | -------------- | -------------- | ( ) Yes |
| Inter trip send/Rcv faulty | ( ) Yes |
| Switch off DC supply fail MCB R2 | R2 DC supply fail | CH ---- | Back up protection  Faulty | ------------- | -------------- | ( ) Yes |
| Switch off IT DC supply fail MCB | IT DC supply fail | CH ---- | Inter trip dc supply faulty | ------------- | -------------- | ( ) Yes |
| CBF DC supply MCB off in BBCH panel | CBF DC supply fail | CH ---- | Cbf protection faulty | ------------- | -------------- | ( ) Yes |

1. **OPERATIONAL CHECK:**

Local / Remote Switch in local position, no operation from CR & ECC for all equipments is O.K ( ) or Not O.K ( )

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| LCC D----- | From control panel (k----) | From ----+  FMK----- | Device operated | Command | Remarks | | |
| Flickering operation | Indications | Operation as expected |
| Local/ Remote | CR/ ECC |
| Remote | CR |  | Disconnector ----06 | Close |  |  |  |
| Remote | ECC |  | Disconnector ----06 | Close |  |  |  |
| Remote | CR |  | Disconnector ---- 06 | Open |  |  |  |
| Remote | ECC |  | Disconnector ----06 | Open |  |  |  |
| Remote | CR |  | Disconnector ---- 04 | Close |  |  |  |
| Remote | ECC |  | Disconnector ---- 04 | Close |  |  |  |
| Remote | CR |  | Disconnector -----04 | Open |  |  |  |
| Remote | ECC |  | Disconnector -----04 | Open |  |  |  |
| Remote | CR |  | Line Disconnector----03 | Close |  |  |  |
| Remote | ECC |  | Line Disconnector ---03 | Close |  |  |  |
| Remote | CR |  | Line Disconnector ---03 | Open |  |  |  |
| Remote | ECC |  | Line Disconnector ---03 | Open |  |  |  |
| Remote | CR |  | Line earth switch -----01 | Close | - |  |  |
| Remote | CR |  | Line earth switch ---- 01 | Open | - |  |  |
| Remote | CR |  | Circuit breaker ----- 05 (Test & service position) | Close | - |  |  |
| Remote | ECC |  | Circuit Breaker ----05 (service position) | Close | - |  |  |
| Remote | CR |  | Circuit Breaker -----05 (test & service position) | Open | - |  |  |
| Remote | ECC |  | Circuit Breaker -------05 (service position) | Open | - |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LCC D --- | Device operated | Command | Remarks | |
| Semaphore indications | Operation as expected |
| Operate from LCC | Earth Switch -----01X | Close |  |  |
| Operate from LCC | Earth Switch -----01X | Open |  |  |
| Operate from LCC | Earth Switch ------01Y | Close |  |  |
| Operate from LCC | Earth Switch ------01Y | Open |  |  |
| Operate from LCC | Earth Switch -------01Z | Close |  |  |
| Operate from LCC | Earth Switch -------01Z | Open |  |  |
| Operate from LCC | VT isolator ----------93 | Close |  |  |
| Operate from LCC | VT isolator ----------93 | Open |  |  |

1. **CIRCUIT BREAKER CLOSE BLOCK CHECK**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Control panel  (K---) | C B position | Synchronism check | | Circuit Breaker Close Blocking Protection | | | | Operation of circuit breaker | | Remarks |
| CR/ECC | By Manual switch | By syn. Relay  ------ | Main protn  ------ | Back-up protn.  --------- | CBF protn.  -------- | Bus bar protn  -------- |
| To | Expected |
| CR | Test | - | - | - | - | - | - | Close | Close |  |
| CR | Test | - | - | - | - | - | - | Open | Open |  |
| CR | Service | On | Close | N/o | N/o | N/o | N/o | Close | Close |  |
| CR | Service | Off | Close | N/o | N/o | N/o | N/o | Close | Not close |  |
| CR | Service | On | Open | N/o | N/o | N/o | N/o | Close | Not close |  |
| CR | Service | On | Close | O | N/o | N/o | N/o | Close | Not close |  |
| CR | Service | On | Close | N/o | O | N/o | N/o | Close | Not close |  |
| CR | Service | On | Close | N/o | N/o | O | N/o | Close | Not close |  |
| CR | Service | On | Close | N/o | N/o | N/o | O | Close | Not close |  |
| ECC | Test | - | - | - | - | - | - | Close | Not close |  |
| ECC | Test | - | - | - | - | - | - | Open | Not open |  |
| ECC | Service | Off | Close | N/o | N/o | N/o | N/o | Close | Close |  |
| ECC | Service | Off | Open | N/o | N/o | N/o | N/o | Close | Not close |  |
| ECC | Service | Off | Close | O | N/o | N/o | N/o | Close | Not close |  |
| ECC | Service | Off | Close | N/o | O | N/o | N/o | Close | Not close |  |
| ECC | Service | Off | Close | N/o | N/o | O | N/o | Close | Not close |  |
| ECC | Service | Off | Close | N/o | N/o | N/o | O | Close | Not close |  |

Note: N/o - not operated O – operated

1. **CIRCUIT BREAKER TRIP CIRCUIT (TC-1) CHECK:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Circuit breaker position | Main protn  ----------- | Busbar protn.  -------------- | Inter-trip received  --------------- | Operation | | Remarks |
| Expected | Operated |
| Test/service |  |  |  | Trip |  |  |
| Test/service |  |  |  | Trip |  |  |
| Test/service |  |  |  | Trip |  |  |

1. **CIRCUIT BREAKER TRIP CIRCUIT(T C-2) CHECK:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Circuit breaker position | Bk / up protn.  ---------- | Bus bar protn.  --------------- | Inter-trip received  -------------- | Operation | | Remarks |
| Expected | Operated |
| Test/service |  |  |  | Trip |  |  |
| Test/service |  |  |  | Trip |  |  |
| Test/service |  |  |  | Trip |  |  |

Note: N/o - not operated O – operated

1. **ANNUNCIATION ALARM CHECK**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Alarm | Event | K----- control panel(ann1) | FMK------ panel(TB) | Indication | Remarks |
|  |  |  |  |  |  |
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Note: \*Checked by Multi-meter