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

1. **GENERAL DATA AND INFORMATION:**

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

1. **MECHANICAL CHECK AND VISUAL INSPECTION:** 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 (Visually) | ❑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 | Panel Earthing checked | ❑Yes | ❑N/A |
| 10 | Confirm that panels are constructed and wired as per SEC relevant specification.  | ❑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 PANEL FUNCTIONAL CHECKS**: As per TCS–P-105 Item no 5.1

|  |  |  |
| --- | --- | --- |
| Item | Description | Remarks |
|  | Check Output of AC Outlet | ❑Yes  | ❑N/A  |
|  | Check Illumination Lamp | ❑Yes  | ❑N/A  |
|  | Check Door Switch | ❑Yes  | ❑N/A  |
|  | Check Heater / Thermostat  | ❑Yes  | ❑N/A  |

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  Item | Measuring Points in MCB | X ---- : ---- , --- | X ---- : ---- , --- | X ---- : ---- , --- | X ---- : ---- , --- |
| 1 |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Protection operated | Relay panel R -------- | Control panel ---- | Fault Recorder | CB operation | FMK | Remarks | Function as Expected |
| Trip Relay | CBF Start | Ind / Flag Relay | CH | Alarms | CH | Events | Trip | Close Block | TB |
| 50 -51 /50N – 51N Protection | 86 Bu | 50 / 62 BF | 51 / 51N Protection | Ch - | o/c & E/f protection operated | FR ----- | BC -------51/51 N Prot optd | TC 1 & TC 2 |  | X -----: ---- , - | Switch (IN/OUT) “OUT” position | ( ) Yes |
| CH ----- |
| 50 -51 / 50N – 51N Protection | 86 Bu | 50 / 62 BF | 50 / 50N Protection | Ch - | Inst o/c & Inst E/f prot op |  |  | TC 1 & TC 2 |  | X -----: ---- , - | Switch(IN/OUT) “IN” position | ( ) Yes |
|  |
| 50 BF + 62 CBF Breaker Fail Protection | 86 CBF |  | 50 / 62 BF | CH -- | CBF Prot optd | FR ----- | BC ---- CBF Prt Optd | TC 1 & TC 2 |  | X -----: ---- , - |  | ( ) Yes |
| 86B -1- & 2 ---- |  | CH ----- |
| BB 1 ---- Bus bar protection Trip | 86 B-1- | 50/62CBF |  |  |  |  |  | TC 1 & TC 2 |  | X -----: ---- , |  | ( ) Yes |
|  |
| BB 2 ---- Bus bar protection Trip | 86 B-1- | 50/62CBF |  |  |  |  |  | TC 1 & TC 2 |  | X -----:---- , |  | ( ) Yes |
|  |
| U/V 27 VT 1-- |  |  |  | Ch - | Bus VT#1 Fail |  |  |  |  | X -----: ---- , |  | ( ) Yes |
| U/V 27 VT 2-- |  |  |  | Ch - | Bus VT#2 Fail |  |  |  |  | X -----: ---- , |  | ( ) Yes |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Event | Relay panel R -------- | Control panel ---- | FMK | Remarks | Function as Expected |
| Indication / Flag Relay | CH | Alarms | TB |
| Breaking path of supervision circuit R1 | 74 R1 | Ch -- | Over current &Earth fault protection faulty | X -----: ---- , ---- |  | ( ) Yes |
| R1 DC supply fail |
| Breaking path of supervision circuit TRS (Trip Reset Supply) | 74 TRS | Ch -- | Control supply Fail | X -----: ---- , ---- |  | ( ) Yes |
| TRS DC supply fail |
| Breaking Path of supervision Circuit CBF | 74 BF | Ch -- | CBF Protection Faulty | X -----: ---- , ---- |  | ( ) Yes |
| CBF D.C. supply fail |
| Breaking path of supervision circuit Indication supply | 74 IC | Ch -- | Control supply Fail | X -----: ---- , ---- |  | ( ) Yes |
| Breaking path of supervision circuit TC1 | 74 TC1 | Ch -- | Trip Circuit -1 Faulty | X -----: ---- , ---- |  | ( ) Yes |
| Trip CKT -1 Faulty |
| Breaking path of supervision circuit TC2 | 74 TC2 | Ch -- | Trip Circuit -2 Faulty | X -----: ---- , ---- |  | ( ) Yes |
| Trip CKT -2 Faulty |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Event | Relay panel R -------- | Control panel K---- | FMK | Remarks | Function as Expected |
| Indication / Flag Relay | CH | Alarms | TB |
| BB ------ VT under voltage | 27 VT ------ | Ch -- | Bus VT ------ A Failed | X -----: ---- , ---- |  | ( ) Yes |
| BB ------ under voltage Relay Faulty | ------- MCB Off | Ch -- | 27 VT ------- A Faulty | X -----: ---- , ---- |  | ( ) Yes |
| BB ------ VT under voltage | 27 VT ------ | Ch -- | Bus VT ------ A Failed | X -----: ---- , ---- |  | ( ) Yes |
| BB ------ under voltage Relay Faulty | ------- MCB Off | Ch -- | 27 VT ------- A Faulty | X -----: ---- , ---- |  | ( ) Yes |
| 51 / 51N Faulty | ------- MCB Off | Ch -- | Over current & Earth Fault Protection Faulty | X -----: ---- , ---- |  | ( ) Yes |
| Synchro Check Relay Faulty |  | Ch -- | Synchro Check Relay Faulty | X -----: ---- , ---- |  | ( ) Yes |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Event | Relay panel R -------- | Control panel K---- | Remarks | Function as Expected |
| Indication / Flag Relay | CH | Alarms |
| R1 DC supply MCB Off | R1 DC supply fail74 R1 | Ch --Ch --Ch 1 -- | Over current & Earth Fault protection Faulty27 VT ------- Faulty |  | ( ) Yes |
|  |
| 27 VT ------- Faulty |
| DCDB switch off ----- off | R1 DC supply fail74 R1 | Ch --Ch --Ch 1 -- | Over current & Earth Fault protection Faulty27 VT ------- A Faulty | DCDB MCB Trip Alarm also come in common panel | ( ) Yes |
|  |
| 27 VT ------- A Faulty |
| Trip Reset DC supply MCB Off | TRS DC supply Fail | Ch -- | Control supply failed |  | ( ) Yes |
| 74 TRS |
| DCDB switch off ----- off | TRS DC supply Fail | Ch -- | Control supply failed | DCDB MCB Trip Alarm also come in common panel | ( ) Yes |
| 74 TRS |
| Bf protn Selector switch supply fail | CBF DC supply Fail | Ch -- | CBF Protection Faulty |  | ( ) Yes |
| CBF DC supply MCB off in BB CHZ panel | CBF DC supply Fail | Ch -- | CBF Protection Faulty |  | ( ) Yes |

1. **OPERATION CHECKS:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| LCC D -- 30 | From control panel(k----30) | From FMK-------- | Device Operated | Command | Remarks |
| Flickering operation | Indications | Operation as expected |
| Local/ Remote | CR/ECC |
| Remote | CR |  | Disconnector -----34 | Close |  |  |  |
| Remote | ECC |  | Disconnector -----34 | Close |  |  |  |
| Remote | CR |  | Disconnector -----34 | Open |  |  |  |
| Remote | ECC |  | Disconnector -----34 | Open |  |  |  |
| Remote | CR |  | Disconnector -----36 | Close |  |  |  |
| Remote | ECC |  | Disconnector -----36 | Close |  |  |  |
| Remote | CR |  | Disconnector ---36 | Open |  |  |  |
| Remote | ECC |  | Disconnector ----36 | Open |  |  |  |
| Remote | CR | - | C .B ------30 (test & service position) | Close |  |  |  |
| Remote | ECC |  | C. B -----30 (service position) | Close |  |  |  |
| Remote | CR |  | C.B ------30 (test & serviceposition) | Open |  |  |  |
| Remote | ECC |  | C.B -------30 (service Position) | Open |  |  |  |
| LCC D----------30 | Device operated | Command | Remarks |
| Semaphore indications | Operation as expected |
| Operate from LCC | Earth Switch ----31A | Close |  |  |
| Operate from LCC | Earth Switch ----31A | Open |  |  |
| Operate from LCC | Earth Switch ----31B | Close |  |  |
| Operate from LCC |  Earth Switch --- 31B | Open |  |  |
| Operate from LCC | VT Isolator 194A | Close |  |  |
| Operate from LCC | VT Isolator 194A | Open |  |  |
| Operate from LCC | VT Isolator 296A | Close |  |  |
| Operate from LCC | VT Isolator 296A | Open |  |  |

1. **CIRCUIT BREAKER CLOSE BLOCK CHECK**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Control panel(K---30) | CBPosition | Synchronism check | Circuit breaker close blocking protection | Operation of circuit breaker | Remark |
| CR/ECC | By Manual Switch | By Syn. Relay ------- | CBF protn------- | BB protn-------- | BB protn--------- | BK / UP protn--------- | VT---MCB -- | VT---- MCB -- |
| To | Expected |
| CR | Test | - | - | - | - | - | - | - | - | Close | Close |  |
| CR | Test | - | - | - | - | - | - | - | - | Open | Open |  |
| CR | Service | On | Close | N/o | N/o | N/o | N/o | On | On | Close | Close |  |
| CR | Service | Off | Close | N/o | N/o | N/o | N/o | On | On | Close | Not close |  |
| CR | Service | On | Open | N/o | N/o | N/o | N/o | On | On | Close | Not close |  |
| CR | Service | On | Close | O | N/o | N/o | N/o | On | On | Close | Not close |  |
| CR | Service | On | Close | N/o | O | N/o | N/o | On | On | Close | Not close |  |
| CR | Service | On | Close | N/o | N/o | O | N/o | On | On | Close | Not close |  |
| CR | Service | On | Close | N/o | N/o | N/o | O | On | On | Close | Not close |  |
| CR | Service | On | Close | N/o | N/o | N/o | N/o | Off | On | Close | Not close |  |
| CR | Service | On | Close | N/o | N/o | N/o | N/o | On | Off | 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 | On | On | Close | Close |  |
| ECC | Service | Off | Open | N/o | N/o | N/o | N/o | On | On | Close | Not close |  |
| ECC | Service | Off | Close | O | N/o | N/o | N/o | On | On | Close | Not close |  |
| ECC | Service | Off | Close | N/o | O | N/o | N/o | On | On | Close | Not close |  |
| ECC | Service | Off | Close | N/o | N/o | O | N/o | On | On | Close | Not close |  |
| ECC | Service | Off | Close | N/o | N/o | N/o | O | On | On | Close | Not close |  |
| ECC | Service | Off | Close | N/o | N/o | N/o | N/o | Off | On | Close | Not close |  |
| ECC | Service | Off | Close | N/o | N/o | N/o | N/o | On | Off | Close | Not close |  |

Note: N/O - Not Operated O – Operate

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| C. B position | BB protn-------- | BB protn -------- | B / up protn -------- | Operation | Remarks |
| Expected | Operated |
| Test/service |  |  |  | Trip |  |  |
| Test/service |  |  |  | Trip |  |  |
| Test/service |  |  |  | Trip |  |  |

1. **CIRCUIT BREAKER TRIP CIRCUIT (TC 2) CHECK**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| C. B position | Bb protn ------- | Bb protn --------- | B / up protn ------- | 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 pane (Ann) | Fmk ----- panel (TB) | Indication | Remarks |
|  |  |  |  |  |  |
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 Note: \*Checked by Multi-meter