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 inspection: As per TCS–P-105 Rev -01, Item No 4.1

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Description | Checked | |
|  | Check tightness of all connections | ❑Yes | ❑N/A |
|  | Inspect for physical damage / defects | ❑Yes | ❑N/A |
|  | Panel condition, cleanliness, organization, labeling, readiness for service, panel doors, handles...etc | ❑Yes | ❑N/A |
|  | CT shorting checked | ❑Yes | ❑N/A |
|  | Indications checked | ❑Yes | ❑N/A |
|  | Contact resistance of tripping and alarm checked | ❑Yes | ❑N/A |
|  | Check the ferrules as per specification | ❑Yes | ❑N/A |
|  | Check panel Earthing | ❑Yes | ❑N/A |
|  | Confirm that each panel has been properly secured to the floor in its final service location. | ❑Yes | ❑N/A |
|  | Confirm that panels are constructed and wired as per SEC relevant specification. | ❑Yes | ❑N/A |
|  | Check case cover and gasket for proper seal against dust. | ❑Yes | ❑N/A |
|  | Check all installed equipment nameplate information for compliance to approved drawings and equipment /material lists. | ❑Yes | ❑N/A |
|  | 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 |
|  | Check that panel equipment is mounted securely and protected against mal operation due to vibration, shock, etc | ❑Yes | ❑N/A |
|  | 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 – 01, 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:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Item | Measuring points in MCB | X ---- : ---- , --- | | X ---- : ---- , --- | | X ---- : ---- , --- | | X ---- : ---- , --- | |
| 1 |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Protection operated | Relay panel ----------- | | | | Control panel -- | | Fault recorder | | Hv & Lv CB | | FMK -- | Remark | Function as expected |
| Trip relay | CBF start | ACSE  Start | IND /flag relay | Channel | Alarms | Ch | Event | Trip | Close  Block | T.B |
| 87 T Diff Prtn | 86 T1 | 50 / 62 BF | X--:--,- | 87 T | Ch - | TR Diff Prtn | FR --- | GT----- 87T optd | CB –TC1 | CB ---- | X--:--,-- |  | ( ) Yes |
| 94 T1 | CH --- | CB S --- | CB S - |
| 50P /51P HV O/C prtn | 86 T1 | 50 / 62 BF | -------- | 50 / 51 P | Ch - | TR HV O/C prtn | FR ---- | GT --- 51S  50 / 51 prtn optd | CB --TC1 | CB ---- | X--:--,--- |  | ( ) Yes |
| 94 T1 | CH --- | CB S ---- | CB S - |
| 50S/51S  --- 50S/51 NS LV O/C prtn | 94 T2 | ------- | -------- | 50S/51S  50S/51 NS | Ch - | TR LV O/C + E/F prtn optd | FR --- | GT --- 51S  50 / 51 prtn optd | CB S ---- | -------- | X--:--,-- |  | ( ) Yes |
| CH --- | -------- |
| 64 NP HV REF prtn | 86 T2 | 50 / 62 BF | X--:--,- | HV REF 64 NP optd | Ch - | TR HV REF prtn optd | FR --- | GT --- 64 NP / 64NS optd | CB – TC2 | CB –TC2 | X--:--,--- |  | ( ) Yes |
| 94 T2 | CH --- | CB S ---- | CB S ---- |
| 64 NS LV REF prtn | 86 T2 | 50 / 62 BF | X--:--,- | LV REF  64 NS optd | Ch - | TR LV REF prtn optd | FR --- | GT --- 64 NP / 64 NS optd | CB – TC2 | CB –TC2 | X--:--,--- |  | ( ) Yes |
| 94 T2 | CH---- | CB S ---- | CB S - |
| 51 N stand BY E/F prtn | 86 T1 | 50 / 62 BF | -------- | 51 N | Ch -- | TR stand BY E/F prtn optd | FR ---- | GT --- 51 N optd | CB --TC1 | CB ------ | X--:--,-- |  | ( ) Yes |
| CB S ---- | CB S - |
| 94 T1 | CH---- |
| 51 NA neutral O/C alarm | ------ | ----- | ------ | Neutral O/C Alarm 51 NA optd | CH -- | TR neutral O/C alam | ------ | ----- | ------- | ------ | FMK --  X--:--,-- | THIS alarm for com panel | ( ) Yes |
| ------ | ------ |  | ------ |
| 50 / 62 BF breaker prtn | 86 B | 50 / 62 BF | X--:--,- | 50 / 62 BF | CH - | CBF prtn optd | FR ---- | GT----- CBF optd | CB –----  Tc1 &  Tc2  CB S --- | CB ---- | X--:--,-- |  | ( ) Yes |
| 86  CBF | CH --- | CB S --- |
| 86B B/B prtn trip | 86 B | 50 / 62 BF | X--:--,- | 86 B | CH - | -------- | ---- | -------- | CB –-----  Tc1 & Tc2 | CB ---- | X--:--,--- | Switch (in / out ) "out" position | ( ) Yes |
| --- | CB S ---- | CB S - |
| 86B B/B prtn trip | 86 B | 50 / 62 BF | X--:--,- | 86 B | CH -- | -------- | ---- | -------- | CB ----  Tc1 &Tc2 | CB ------ | X--:--,-- | Switch (in / out ) "in" position | ( ) Yes |
| 86 CBF | --- | CB S ---- | CB S --- |
| 96 – 2 Buch surge trip K -- | 86 T2 | 50 / 62 BF | X--:--,- | ------- | CH -- | TR buch stage – 2 prtn optd | FR ---- | GT --- Buchholz optd | CB – TC2 | CB ----- | X--:--,--- | Trip signal is cutted after 5 sec | ( ) Yes |
| 94 T2 | CH --- | CB S ---- | CB S --- |
| 63QP -2 Tap chan prot dev trip k -- | 86 T2 | 50 / 62 BF | X--:--,- | --------- | CH -- | Tap Change Prtn Device trip | FR ---- | -------- | CB – TC2 | CB ----- | X--:--,--- | Trip signal is cutted after 5 sec | ( ) Yes |
| 94 T2 | CH---- | CB S ---- | CB S --- |
| 26 S TR fire prtn optd K --- | -------- | ---------- | -------- | -------- | CH | TR fire prtn optd | FR ---- | GT --- fire prtn optd | -------- | ------ | X--:--,-- |  | ( ) Yes |
| --------- | ------ |
| ------- | CH---- |
| 49 T wdg temp high stage - 2 | 94 T1 | ----- | X--:--,- | -------- | CH -- | TR wdg temp high stage – 2 optd | ------ | ----- | CB S ----- | ------ | X--:--,-- |  | ( ) Yes |
| ------ |
| ------ |
| Rapid pressure rise relay trip | ----- | ----- | ----- | --------- | CH -- | Rapid pressure rise relay trip | ------ | ------ | ------- | ------ | X--:--,-- |  | ( ) Yes |
|  |
|  |
| ------ |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Event | Relay panel ----- | Control panel --------- | | FMK---- | Remarks | Function as expected |
| Indication/flag relay | Channel | Alarm | T.B |
| Breaking path of supervision circuit R1 | 74R1 | CH --- | Transformer main  Protection faulty | X ---:--,- |  | [ ] Yes |
| R1 DC supply fail |
| Breaking path of supervision circuit R2 | 74 R2 | CH ---- | Transformer back up protection faulty | X ---:--,- |  | [ ] Yes |
| R2 DC supply fail |
| Breaking path of supervision circuit s2 | 74 S2 | Ch ---- | Transformer mech protection faulty | X ---:--,- |  | [ ] yes |
| S2 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 trs | 74TRS | Ch ----- | Control supply fail | X ---:--,-- |  | [ ] yes |
| TRS DC supply fail |
| Breaking path of supervision circuit tc1 | 74TC1 | Ch ----- | Trip circuit-1 faulty | X ---:--,-- |  | [ ] yes |
| Trip ckt-1 faulty |
| Breaking path of supervision circuit tc2 | 74TC2 | Ch ------ | Trip circuit-2 faulty | X ---:--,-- |  | [ ] yes |
| Trip ckt-2 faulty |
|  |  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Event | Relay panel ----- | Control panel --------- | | Remarks | Function as expected |
| Indication / flag relay | Ch | Alarm |
| 87 T faulty | 87T D.C supply ---- MCB off | Ch --- | Transformer main protection faulty |  | [ ] yes |
| 50 / 51 P faulty | 50 / 51 P D.C supply -------- MCB off |
| 51 N faulty | 51 N D.C. supply ----- MCB off | Ch --- | Transformer back up protection faulty |  | [ ] yes |
| 51 NA faulty | 51 NA D.C. supply ------ MCB off | Ch --- | Transformer neutral current alarm faulty |  | [ ] yes |
| 50S / 51S – 50NS / 51NS faulty | 50S / 51S – 50NS / 51NS D.C.supply ----- MCB off | Ch --- | Transformer back up l.v. protection faulty |  | [ ] yes |
| DCDB switch MCB off | 87 T off | CH -- | Tr back up faulty | DCDB MCB trip alarm also come in common panel | [ ] Yes |
| 50 / 51 P off |
| 51 N | CH -- | Tr back up protection faulty |
| 50S / 51S – 50NS / 51NS | CH -- | Tr back up l.v. protection faulty |
| 51 NA | CH -- | Tr neutral current alarm faulty |
| Switch off ------ | R2 DC supply fail | CH -- | Transformer back up protection faulty | [ ] Yes |
| DCDB switch off MCB - | R2 DC supply fail | [ ] Yes |
| Switch off ------ | S2 DC supply fail | CH -- | Transformer mech protection faulty | [ ] Yes |
| DCDB switch off MCB - | S2 DC supply fail | [ ] Yes |
| Switch off ------ | CBF DC supply fail | CH -- | CBF protection faulty |  | [ ] Yes |
| CBF DC supply MCB off in BBCHZ panel | CBF DC supply fail |

1. **OPERATIONAL CHECK:**

Local / RemoteSwitch 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 |  | C.B.--- 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 | - |  |  |

1. **13.8KV SWGR (---------):**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Remote | CR |  | Circuit Breaker S------05  (test & service position) | Close | - |  |  |
| Remote | ECC |  | Circuit Breaker S------05 (service position) | Close | - |  |  |
| Remote | CR |  | Circuit Breaker S-----05  (Test & Service position) | Open | - |  |  |
| Remote | ECC |  | Circuit Breaker S-----05 (service position) | Open | - |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LCC D--------- | Device operated | Command | Remarks | |
| Semaphore  indication | 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 |  |  |
| Operate from k----- | Earth Switch S-------01 | Close/open |  |  |

1. **CIRCUIT BREAKER CLOSE BLOCK CHECK**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Control panel  (k-----) | Circuit breaker position | Synchronism check | | Circuit breaker close blocking protection | | | | Operation of circuit breaker | | Remarks |
| CR / ECC | By manual switch | By syn. Relay  ------------ | Lock-out relay ( ---------) | Lock-out relay  (--------) | 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 | Lock-out relay  -------- | Bus bar protn ------ | Operation | | Remarks |
| Expected | Operated |
| Test/service | O; terminal: | - | Trip | Trip |  |
| Test/service | - | O; terminal: | Trip | Trip |  |

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Circuit breaker position | Lock-out relay  ------- | Bus bar protn  ------- | Operation | | Remarks |
| Expected | Operated |
| Test/service | O; terminal: | - | Trip | Trip |  |
| Test/service | - | O; terminal: | Trip | Trip |  |

Note: N/O - not operated O – operated

1. **ANNUNCIATION ALARM CHECK:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Alarm | Event | K------- control panel  (Ann ---) | FMK------ panel(TB) | Indication | Remarks |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Note: \*Checked by Multi-meter