As Per the Schematic Drawings the Contents in This Test Format Can Be Modified

1. **GENERAL DATA AND INFORMATION**

|  |  |
| --- | --- |
| Panel Designation |  |
| Serial No |  |
| Manufacture |  |
| Dwg & Sch No |  |
| Panel No |  |

1. **MECHANICAL CHECK AND VISUAL INSPECTION** As per TCS–P-105 Rev -01, 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 | 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 Rev -01, Item no 5.1 & 5.7

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Description | Remarks | |
| 1 | Check Output Of Ac Outlet | ❑Yes | ❑N/A |
| 2 | Check Illumination Lamp | ❑Yes | ❑N/A |
| 3 | Check Door Switch | ❑Yes | ❑N/A |
| 4 | Check Heater / Thermostat | ❑Yes | ❑N/A |

1. **DC LOOP TEST**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Loop Function | Loop Open Due to | | | | | | Supervision Relay | |
| MCB off | TB | Protection Relay | FMK | ( ) | ( ) | Expected | Actual |
|  |  |  |  |  |  |  |  |  |
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1. **SINGLE LINE DIAGRAM**

LOWER BUS

124A

124B

120

105

305

205

405

104

106

306

304

206

204

406

404

UGF

GRID T1

UGF

GRID T2

BB SEC 1A

BB SEC 1B

UPPER BUS

226A

226B

BB SEC 2A

BB SEC 2B

136

130

134

230

236

234

1. **FUNCTIONAL CHECKS OF DISCRIMINATION ZONE 1A**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Discrimination zone | | | Check zone | | | Trip initiate | |
| In/Out | CT supervision | 87B | In/Out status | CT supervision | 87B-CH | Expected | Actual |
| In | Healthy | Operated | In | Healthy | Operated | Yes |  |
| In | Healthy | Operated | Out | Healthy | ------ | Yes |  |
| In | Healthy | Operated | In | Un healthy | Not operated | Yes |  |
| Out | Healthy | ------ | In | Healthy | Operated | Yes |  |
| Out | Healthy | ------ | Out | Healthy | ------ | NO |  |
| Out | Healthy | ------ | In | Un healthy | Not operated | No |  |
| In | Un healthy | Not operated | In | Healthy | Operated | Yes |  |
| In | Un healthy | Not operated | Out | Healthy | ------ | NO |  |
| In | Un healthy | Not operated | In | Un healthy | Not operated | No |  |

Note:

1. Observe R130 86B-1A / 86B-2A. For zone 1A / 2A trip indication.
2. Observe R130 86B-1B / 86B-2B. For zone 1B / 2B trip indication.
3. **FUNCTIONAL CHECKS OF DISCRIMINATION ZONE 2A:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Discrimination zone | | | Check zone | | | Trip initiate | |
| In/Out | CT supervision | 87B | In/Out status | CT supervision | 87B-CH | Expected | Actual |
| In | Healthy | Operated | In | Healthy | Operated | Yes |  |
| In | Healthy | Operated | Out | Healthy | ------ | Yes |  |
| In | Healthy | Operated | In | Un healthy | Not operated | Yes |  |
| Out | Healthy | ------ | In | Healthy | Operated | Yes |  |
| Out | Healthy | ------ | Out | Healthy | ------ | No |  |
| Out | Healthy | ------ | In | Un healthy | Not operated | No |  |
| In | Un healthy | Not operated | In | Healthy | Operated | Yes |  |
| In | Un healthy | Not operated | Out | Healthy | ------ | No |  |
| In | Un healthy | Not operated | In | Un healthy | Not operated | No |  |

Note:

1. Observe R130 86B-1A / 86B-2A. For zone 1A / 2A trip indication.
2. Observe R130 86B-1B / 86B-2B. For zone 1B / 2B trip indication.
3. **FUNCTIONAL CHECKS OF DISCRIMINATION ZONE 1B:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Discrimination zone | | | Check zone | | | Trip initiate | |
| In/Out | CT supervision | 87B | In/Out status | CT supervision | 87B-CH | Expected | Actual |
| In | Healthy | Operated | In | Healthy | Operated | Yes |  |
| In | Healthy | Operated | Out | Healthy | ------ | Yes |  |
| In | Healthy | Operated | In | Un healthy | Not operated | Yes |  |
| Out | Healthy | ------ | In | Healthy | Operated | Yes |  |
| Out | Healthy | ------ | Out | Healthy | ------ | No |  |
| Out | Healthy | ------ | In | Un healthy | Not operated | No |  |
| In | Un healthy | Not operated | In | Healthy | Operated | Yes |  |
| In | Un healthy | Not operated | Out | Healthy | ------ | No |  |
| In | Un healthy | Not operated | In | Un healthy | Not operated | No |  |

Note:

1. Observe R130 86B-1A / 86B-2A. For zone 1A / 2A trip indication.
2. Observe R130 86B-1B / 86B-2B. For zone 1B / 2B trip indication.
3. **FUNCTIONAL CHECKS OF DISCRIMINATION ZONE 2B:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Discrimination zone | | | Check zone | | | Trip initiate | |
| In/Out | CT supervision | 87B | In/Out status | CT supervision | 87B-CH | Expected | Actual |
| In | Healthy | Operated | In | Healthy | Operated | Yes |  |
| In | Healthy | Operated | Out | Healthy | ------ | Yes |  |
| In | Healthy | Operated | In | Un healthy | Not operated | Yes |  |
| Out | Healthy | ------ | In | Healthy | Operated | Yes |  |
| Out | Healthy | ------ | Out | Healthy | ------ | No |  |
| Out | Healthy | ------ | In | Un healthy | Not operated | No |  |
| In | Un healthy | Not operated | In | Healthy | Operated | Yes |  |
| In | Un healthy | Not operated | Out | Healthy | ------ | No |  |
| In | Un healthy | Not operated | In | Un healthy | Not operated | No |  |

Note:

1. Observe R130 86B-1A / 86B-2A. For zone 1A / 2A trip indication.
2. Observe R130 86B-1B / 86B-2B. For zone 1B / 2B trip indication.
3. **Functional Checks of Discrimination Zone 1A & 2A (130, 120, &230) are Open**

Check Zone operation Condition is simulated:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Bus bar protection zone operation | Bay bus Disconnector position | | 86B (1A) | | 86B(2A) | |
| Expected | Actual | Expected | Actual |
| 1A  (87B 1A) | 104 | Open | N.OP |  | N.OP |  |
| Close | OP |  | N.OP |  |
| 106 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | N.OP |  |
| 304 | Open | N.OP |  | N.OP |  |
| Close | OP |  | N.OP |  |
| 306 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | N.OP |  |
| 2A  (87B 2A) | 104 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | N.OP |  |
| 106 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | OP |  |
| 304 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | N.OP |  |
| 306 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | OP |  |

Note: N.OP = Not Operated, OP = Operated.

1. **Functional checks of Discrimination Zone 1B & 2B (130, 120, &230) are open**

Check Zone operation Condition is simulated

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Bus bar protection zone operation | Bay bus disconnector position | | 86B (1B) | | 86B(2B) | |
| Expected | Actual | Expected | Actual |
| 1B  (87B 1B) | 204 | Open | N.OP |  | N.OP |  |
| Close | OP |  | N.OP |  |
| 206 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | N.OP |  |
| 404 | Open | N.OP |  | N.OP |  |
| Close | OP |  | N.OP |  |
| 406 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | N.OP |  |
| 2B  (87B 2B) | 204 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | N.OP |  |
| 206 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | OP |  |
| 404 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | N.OP |  |
| 406 | Open | N.OP |  | N.OP |  |
| Close | N.OP |  | OP |  |

Note: N.OP = Not Operated, OP = Operated.

1. **Functional checks of Discrimination Zone 1A & 2A with the following conditions,**

Bus coupler (i.e., 134,136 &130) closed and (120 & 130) are open:

Check Zone operation Condition is simulated:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bus bar protection zone operation | Bay bus disconnector position | | 86B (1A) | | 86B(2A) | | Bus Coupler 130 | |
| Expected | Actual | Expected | Actual | 86B(1A) | 86B(2A) |
| 1A  (87B 1A) | 104 | Open | N.OP |  | N.OP |  | OP | N.OP |
| Close | OP |  | N.OP |  | OP | N.OP |
| 106 | Open | N.OP |  | N.OP |  | OP | N.OP |
| Close | N.OP |  | N.OP |  | OP | N.OP |
| 104&106 closed | | OP |  | OP |  | OP | OP |
| 304 | Open | N.OP |  | N.OP |  | OP | N.OP |
| Close | OP |  | N.OP |  | OP | N.OP |
| 306 | Open | N.OP |  | N.OP |  | OP | N.OP |
| Close | N.OP |  | N.OP |  | OP | N.OP |
| 304&306 closed | | OP |  | OP |  | OP | OP |
| 2A  (87B 2A) | 104 | Open | N.OP |  | N.OP |  | N.OP | OP |
| Close | N.OP |  | N.OP |  | N.OP | OP |
| 106 | Open | N.OP |  | N.OP |  | N.OP | OP |
| Close | N.OP |  | OP |  | N.OP | OP |
| 104&106 closed | | OP |  | OP |  | OP | OP |
| 304 | Open | N.OP |  | N.OP |  | N.OP | OP |
| Close | N.OP |  | N.OP |  | N.OP | OP |
| 306 | Open | N.OP |  | N.OP |  | N.OP | OP |
| Close | N.OP |  | OP |  | N.OP | OP |
| 304&306 closed | | OP |  | OP |  | OP | OP |

Note: N.OP = Not Operated, OP = Operated.

1. **Functional checks of Discrimination Zone 1B & 2B with the following conditions,**

Bus coupler (i.e., 234,236 &230) closed and (120 &130) are open:

Check Zone operation Condition is simulated:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bus bar protection zone operation | Bay bus disconnector position | | 86B (1B) | | 86B(2B) | | Bus Coupler 230 | |
| Expected | Actual | Expected | Actual | 86B(1B) | 86B(2B) |
| 1B  (87B 1B) | 204 | Open | N.OP |  | N.OP |  | OP | N.OP |
| Close | OP |  | N.OP |  | OP | N.OP |
| 206 | Open | N.OP |  | N.OP |  | OP | N.OP |
| Close | N.OP |  | N.OP |  | OP | N.OP |
| 204&206 closed | | OP |  | OP |  | OP | OP |
| 404 | Open | N.OP |  | N.OP |  | OP | N.OP |
| Close | OP |  | N.OP |  | OP | N.OP |
| 406 | Open | N.OP |  | N.OP |  | OP | N.OP |
| Close | N.OP |  | N.OP |  | OP | N.OP |
| 404&406 closed | | OP |  | OP |  | OP | OP |
| 2B  (87B 2B) | 204 | Open | N.OP |  | N.OP |  | N.OP | OP |
| Close | N.OP |  | N.OP |  | N.OP | OP |
| 206 | Open | N.OP |  | N.OP |  | N.OP | OP |
| Close | N.OP |  | OP |  | N.OP | OP |
| 204&406 closed | | OP |  | OP |  | OP | OP |
| 404 | Open | N.OP |  | N.OP |  | N.OP | OP |
| Close | N.OP |  | N.OP |  | N.OP | OP |
| 406 | Open | N.OP |  | N.OP |  | N.OP | OP |
| Close | N.OP |  | OP |  | N.OP | OP |
| 404&406 closed | | OP |  | OP |  | OP | OP |

Note: N.OP = Not Operated, OP = Operated

1. **Functional checks of Discrimination Zone 1A & 2A with the following conditions,**

130,120.226A, 226B closed and 230 is open

Check Zone operation Condition is simulated

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bus bar protn zone operation | Bay bus disconnector position | | 86B (1A) | | 86B(2A) | | Bus coupler 130 | | Bus section 120 | | Any feeder connected to 2B |
| E | A | E | A | 86B  (1A) | 86B  (2A) | 86B  (1A) | 86B  (1B) | 86 2B |
| 1A  (87B 1A) | 104 | Open | N.op |  | N.op |  | Op | N.op | Op | N.op | N.op |
| Close | Op |  | N.op |  | Op | N.op | Op | N.op | N.op |
| 106 | Open | N.op |  | N.op |  | Op | N.op | Op | N.op | N.op |
| Close | N.op |  | N.op |  | Op | N.op | Op | N.op | N.op |
| 104&106 closed | | Op |  | Op |  | Op | Op | Op | N.op | Op |
| 304 | Open | N.op |  | N.op |  | Op | N.op | Op | N.op | N.op |
| Close | Op |  | N.op |  | Op | N.op | Op | N.op | N.op |
| 306 | Open | N.op |  | N.op |  | Op | N.op | Op | N.op | N.op |
| Close | N.op |  | Op |  | Op | N.op | Op | N.op | N.op |
| 304&306 closed | | Op |  | Op |  | Op | Op | Op | N.op | Op |
| 2A  (87B 2A) | 104 | Open | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| Close | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| 106 | Open | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| Close | N.op |  | Op |  | N.op | Op | N.op | N.op | Op |
| 104&106 closed | | Op |  | Op |  | Op | Op | Op | N.op | Op |
| 304 | Open | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| Close | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| 306 | Open | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| Close | N.op |  | Op |  | N.op | Op | N.op | N.op | Op |
| 304&306 closed | | Op |  | Op |  | Op | Op | Op | N.op | Op |

Note: N.OP = Not Operated, OP = Operated

1. **Functional checks of Discrimination Zone 1B & 2B with the following conditions,**

130,120.226A, 226B closed and 230 is open

Check Zone operation Condition is simulated

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bus bar protn zone operation | Bay bus disconnector position | | 86B (1B) | | 86B(2B) | | Bus coupler 130 | | Bus section 120 | | Any feeder connected to 2A |
| E | A | E | A | 86B  (1A) | 86B  (2A) | 86B  (1A) | 86B  (1B) | 86 2A |
| 1B  (87B 1B) | 204 | Open | N.op |  | N.op |  | N.op | N.op | N.op | Op | N.op |
| Close | Op |  | N.op |  | N.op | N.op | N.op | Op | N.op |
| 206 | Open | N.op |  | N.op |  | N.op | N.op | N.op | Op | N.op |
| Close | N.op |  | N.op |  | N.op | N.op | N.op | Op | N.op |
| 204&206 closed | | Op |  | Op |  | N.op | Op | N.op | Op | Op |
| 404 | Open | N.op |  | N.op |  | N.op | N.op | N.op | Op | N.op |
| Close | Op |  | N.op |  | N.op | N.op | N.op | Op | N.op |
| 406 | Open | N.op |  | N.op |  | N.op | N.op | N.op | Op | N.op |
| Close | N.op |  | N.op |  | N.op | N.op | N.op | Op | N.op |
| 404&406 closed | | Op |  | Op |  | N.op | Op | N.op | Op | Op |
| 2B  (87B 2B) | 204 | Open | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| Close | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| 206 | Open | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| Close | N.op |  | Op |  | N.op | Op | N.op | N.op | Op |
| 204&206 closed | | Op |  | Op |  | N.op | Op | N.op | Op | Op |
| 404 | Open | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| Close | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| 406 | Open | N.op |  | N.op |  | N.op | Op | N.op | N.op | Op |
| Close | N.op |  | Op |  | N.op | Op | N.op | N.op | Op |
| 404&406 closed | | Op |  | Op |  | N.op | Op | N.op | Op | Op |

Note: N.OP = Not Operated, OP = Operated,

1. **Functional Checks of Discrimination Zone 1A & 2A With the Following Conditions,** 230,120.226A, 226B closed and 130 is open

Check Zone operation Condition is simulated:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bus bar protn zone operation | Bay bus disconnector position | | 86B (1A) | | 86B(2A) | | Bus coupler 230 | | Bus section 120 | | Any feeder  Connected to 2B |
| E | A | E | A | 86B  (1B) | 86B  (2B) | 86B  (1A) | 86B  (1B) | 86 2B |
| 1A  (87B 1A) | 104 | Open | N.OP |  | N.OP |  | N.OP | N.OP | OP | N.OP | N.OP |
| Close | OP |  | N.OP |  | N.OP | N.OP | OP | N.OP | N.OP |
| 106 | Open | N.OP |  | N.OP |  | N.OP | N.OP | OP | N.OP | N.OP |
| Close | N.OP |  | N.OP |  | N.OP | N.OP | OP | N.OP | N.OP |
| 104&106 closed | | Op |  | Op |  | N.op | Op | Op | N.op | Op |
| 304 | Open | N.OP |  | N.OP |  | N.OP | N.OP | OP | N.OP | N.OP |
| Close | OP |  | N.OP |  | N.OP | N.OP | OP | N.OP | N.OP |
| 306 | Open | N.OP |  | N.OP |  | N.OP | N.OP | OP | N.OP | N.OP |
| Close | N.OP |  | N.OP |  | N.OP | N.OP | OP | N.OP | N.OP |
| 304&306 closed | | Op |  | Op |  | N.op | Op | Op | N.op | Op |
| 2A  (87B 2A) | 104 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| Close | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| 106 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| Close | N.OP |  | OP |  | N.OP | OP | N.OP | N.OP | OP |
| 104&106 closed | | Op |  | Op |  | N.op | Op | Op | N.op | Op |
| 304 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| Close | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| 306 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| Close | N.OP |  | OP |  | N.OP | OP | N.OP | N.OP | OP |
| 304&306 closed | | Op |  | Op |  | N.op | Op | Op | N.op | Op |

Note: N.OP = Not Operated, OP = Operated

1. **Functional checks of Discrimination Zone 1B & 2B with the following conditions,**

230,120.226A, 226B closed and 130 is open

Check Zone operation Condition is simulated

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bus bar protection zone operation | Bay bus disconn  Ector position | | 86B (1B) | | 86B(2B) | | Bus coupler 230 | | Bus section 120 | | Any feeder connected to 2A |
| E | A | E | A | 86B  (1B) | 86B  (2B) | 86B  (1A) | 86B  (1B) | 86 2A |
| 1B  (87B 1B) | 204 | Open | N.OP |  | N.OP |  | OP | N.OP | N.OP | OP | N.OP |
| Close | OP |  | N.OP |  | OP | N.OP | N.OP | OP | N.OP |
| 206 | Open | N.OP |  | N.OP |  | OP | N.OP | N.OP | OP | N.OP |
| Close | N.OP |  | N.OP |  | OP | N.OP | N.OP | OP | N.OP |
| 204&206 closed | | Op |  | Op |  | Op | Op | N.op | op | Op |
| 404 | Open | N.OP |  | N.OP |  | OP | N.OP | N.OP | OP | N.OP |
| Close | OP |  | N.OP |  | OP | N.OP | N.OP | OP | N.OP |
| 406 | Open | N.OP |  | N.OP |  | OP | N.OP | N.OP | OP | N.OP |
| Close | N.OP |  | N.OP |  | OP | N.OP | N.OP | OP | N.OP |
| 404&406 closed | | Op |  | Op |  | Op | Op | N.op | Op | Op |
| 2B  (87B 2B) | 204 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| Close | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| 206 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| Close | N.OP |  | OP |  | N.OP | OP | N.OP | N.OP | OP |
| 204&206 closed | | Op |  | Op |  | Op | Op | N.op | Op | Op |
| 404 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| Close | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| 406 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | N.OP | OP |
| Close | N.OP |  | OP |  | N.OP | OP | N.OP | N.OP | OP |
| 404&406 closed | | Op |  | Op |  | Op | Op | N.op | Op | Op |

N.OP = Not Operated, OP = Operated

1. Functional checks of Discrimination Zone 1A & 2A with the following conditions,

230,130.226A, 226B closed and 120 is open

Check Zone operation Condition is simulated

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bus bar protection zone operation | Bay bus disconnector position | | 86B (1A) | | 86B  (2A) | | Bus Coupler 130 | | Bus Coupler 230 | | Any feeder connected to 2B | |
| E | A | E | A | 86B  (1A) | 86B  (2A) | 86B  (1B) | 86B  (2B) | 86 2B | |
| 1A  (87B 1A) | 104 | Open | N.OP |  | N.OP |  | OP | N.OP | N.OP | N.OP | N.OP | |
| Close | OP |  | N.OP |  | OP | N.OP | N.OP | N.OP | N.OP | |
| 106 | Open | N.OP |  | N.OP |  | OP | N.OP | N.OP | N.OP | N.OP | |
| Close | N.OP |  | N.OP |  | OP | N.OP | N.OP | N.OP | N.OP | |
| 104&106 closed | | Op |  | Op |  | Op | Op | N.op | Op | Op | |
| 304 | Open | N.OP |  | N.OP |  | OP | N.OP | N.OP | N.OP | N.OP |
| Close | OP |  | N.OP |  | OP | N.OP | N.OP | N.OP | N.OP |
| 306 | Open | N.OP |  | N.OP |  | OP | N.OP | N.OP | N.OP | N.OP |
| Close | N.OP |  | N.OP |  | OP | N.OP | N.OP | N.OP | N.OP |
| 304&306 closed | | Op |  | Op |  | Op | Op | N.op | Op | Op |
| 2A  (87B 2A) | 104 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | OP | OP |
| Close | N.OP |  | N.OP |  | N.OP | OP | N.OP | OP | OP |
| 106 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | OP | OP |
| Close | N.OP |  | OP |  | N.OP | OP | N.OP | OP | OP |
| 104&106 closed | | Op |  | Op |  | Op | Op | N.op | Op | Op |
| 304 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | OP | OP |
| Close | N.OP |  | N.OP |  | N.OP | OP | N.OP | OP | OP |
| 306 | Open | N.OP |  | N.OP |  | N.OP | OP | N.OP | OP | OP |
| Close | N.OP |  | OP |  | N.OP | OP | N.OP | OP | OP |
| 304&306 closed | | Op |  | Op |  | Op | Op | N.op | Op | Op |

Note: N.OP = Not Operated, OP = Operated

1. **Functional checks of Discrimination Zone 1B & 2B with the following conditions,** 230,130.226A, 226B closed and 120 is open

Check Zone operation Condition is simulated

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bus bar protection zone operation | Bay bus disconnector position | | 86B (1B) | | 86B  (2B) | | Bus coupler 130 | | | Bus coupler 230 | | Any feeder connected to 2A | |
| E | A | E | A | 86B  (1A) | 86B  (2A) | | 86B  (1B) | 86B  (2B) | 86 2A | |
| 1B  (87B 1B) | 204 | Open | N.op |  | N.OP |  | N.OP | N.OP | | OP | N.OP | N.OP |
| Close | Op |  | N.OP |  | N.OP | N.OP | | OP | N.OP | N.OP |
| 206 | Open | N.op |  | N.OP |  | N.OP | N.OP | | OP | N.OP | N.OP |
| Close | N.op |  | N.OP |  | N.OP | N.OP | | OP | N.OP | N.OP |
| 204&206 closed | | Op |  | Op |  | N.op | Op | Op | | Op | Op |
| 404 | Open | N.op |  | N.OP |  | N.OP | N.OP | OP | | N.OP | N.OP |
| Close | Op |  | N.OP |  | N.OP | N.OP | OP | | N.OP | N.OP |
| 406 | Open | N.op |  | N.OP |  | N.OP | N.OP | OP | | N.OP | N.OP |
| Close | N.op |  | N.OP |  | N.OP | N.OP | OP | | N.OP | N.OP |
| 404&406 closed | | Op |  | Op |  | N.op | Op | Op | | Op | Op |
| 2B  (87B 2B) | 204 | Open | N.op |  | N.OP |  | N.OP | OP | N.OP | | OP | OP |
| Close | N.op |  | N.OP |  | N.OP | OP | N.OP | | OP | OP |
| 206 | Open | N.op |  | N.OP |  | N.OP | OP | N.OP | | OP | OP |
| Close | N.op |  | OP |  | N.OP | OP | N.OP | | OP | OP |
| 204&206 closed | | Op |  | Op |  | N.op | Op | Op | | Op | Op |
| 404 | Open | N.op |  | N.OP |  | N.OP | OP | N.OP | | OP | OP |
| Close | N.op |  | N.OP |  | N.OP | OP | N.OP | | OP | OP |
| 406 | Open | N.op |  | N.OP |  | N.OP | OP | N.OP | | OP | OP |
| Close | N.op |  | OP |  | N.OP | OP | N.OP | | OP | OP |
| 404&406 closed | | Op |  | Op |  | N.op | Op | Op | | Op | Op |

Note: N.OP = Not Operated, OP = Operated

1. **BB Protection/ CBF Scheme Check (1A&2A)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Protection zone | Bay bus disconnector position | | 50/62  BFOperate | 86 CBF | | 86B | | Bus bar zone 1A trip | | Bus bar zone 2A trip | |
| E | A | E | A | E | A | E | A |
| 1A | 104 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 106 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 104&106 closed | |  |  |  |  |  |  |  |  |  |
| 304 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 306 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 304&306 closed | |  |  |  |  |  |  |  |  |  |
| 2A | 104 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 106 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 104&106 closed | |  |  |  |  |  |  |  |  |  |
| 304 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 306 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 304&306 closed | |  |  |  |  |  |  |  |  |  |

Note: E = Expected, A = Actual

1. **BB Protection/ CBF Scheme Check (1B & 2B )**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Protection zone | Bay bus disconnector position | | 50/62 BF  Operate | 86 CBF | | 86B | | Bus bar zone 1B trip | | Bus bar zone 2B trip | |
| E | A | E | A | E | A | E | A |
| 1B | 204 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 206 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 204&206 closed | |  |  |  |  |  |  |  |  |  |
| 404 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 406 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 404&406 closed | |  |  |  |  |  |  |  |  |  |
| 2B | 204 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 206 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 204&206 closed | |  |  |  |  |  |  |  |  |  |
| 404 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 406 | Open |  |  |  |  |  |  |  |  |  |
| Close |  |  |  |  |  |  |  |  |  |
| 404&406 closed | |  |  |  |  |  |  |  |  |  |

Note: E = Expected, A = Actual

1. **CBF of 130 operation :**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operation status |  | CB 120  Trip | CB 230 trip | BB prtn zone 1A Trip | BB prtn zone 2A  Trip | BB prtn zone 1B trip | BB prtn zone 2B  Trip |
| 230,120,  226 A,226 B open | E | N.op | N.op | Op | Op | N.op | N.op |
| A |  |  |  |  |  |  |
| 120 closed, 226 A,226 B & 230 open | E | Op | N.op | Op | Op | N.op | N.op |
| A |  |  |  |  |  |  |
| 120 open, 226 A,226 B & 230 closed | E | N.op | Op | Op | Op | N.op | Op |
| A |  |  |  |  |  |  |

Note: N.OP = Not Operated, OP = Operated

1. **CBF OF 230 Operation**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operation status |  | CB 120  Trip | CB 130 trip | BB prtn zone 1A trip | BB prtn zone 2A  Trip | BB prtn zone 1B trip | BB prtn zone 2B  Trip |
| 130,120,  226 A,226 B open | E | N.OP | N.OP | OP | OP | N.OP | N.OP |
| A |  |  |  |  |  |  |
| 120 closed, 226 A,226 B & 130 open | E | OP | N.OP | OP | OP | N.OP | N.OP |
| A |  |  |  |  |  |  |
| 120 OPEN, 226 A,226 B & 130 closed | E | N.OP | OP | OP | OP | N.OP | OP |
| A |  |  |  |  |  |  |

Note: N.OP = Not Operated, OP = Operated

1. **CBF of 120 Operation**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Operation status |  | CB 120  Trip | CB 230 trip | BB prtn zone 1A trip | BB prtn zone 2A  Trip | BB prtn zone 1B trip | BB prtn zone 2B  Trip |
| 230,130,  226 A,226 B open | E | N.op | N.op | Op | N.op | Op | N.op |
| A |  |  |  |  |  |  |
| 130closed226 A,226 B & 230 open | E | Op | N.op | Op | N.op | Op | N.op |
| A |  |  |  |  |  |  |
| 130 open, 226 A,226 B & 230 closed | E | N.op | Op | Op | N.op | Op | N.op |
| A |  |  |  |  |  |  |
| 130 & 230 closed | E | Op | Op | Op | N.op | Op | N.op |
| A |  |  |  |  |  |  |

Note: N.OP = Not Operated, OP = Operated

1. **Auto Reset Scheme Checking:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Feeder | Zone | | | | Trip relay operate | | Trip relay reset | |
| 1A | 2A | 1B | 2B | E | A | E | A |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |