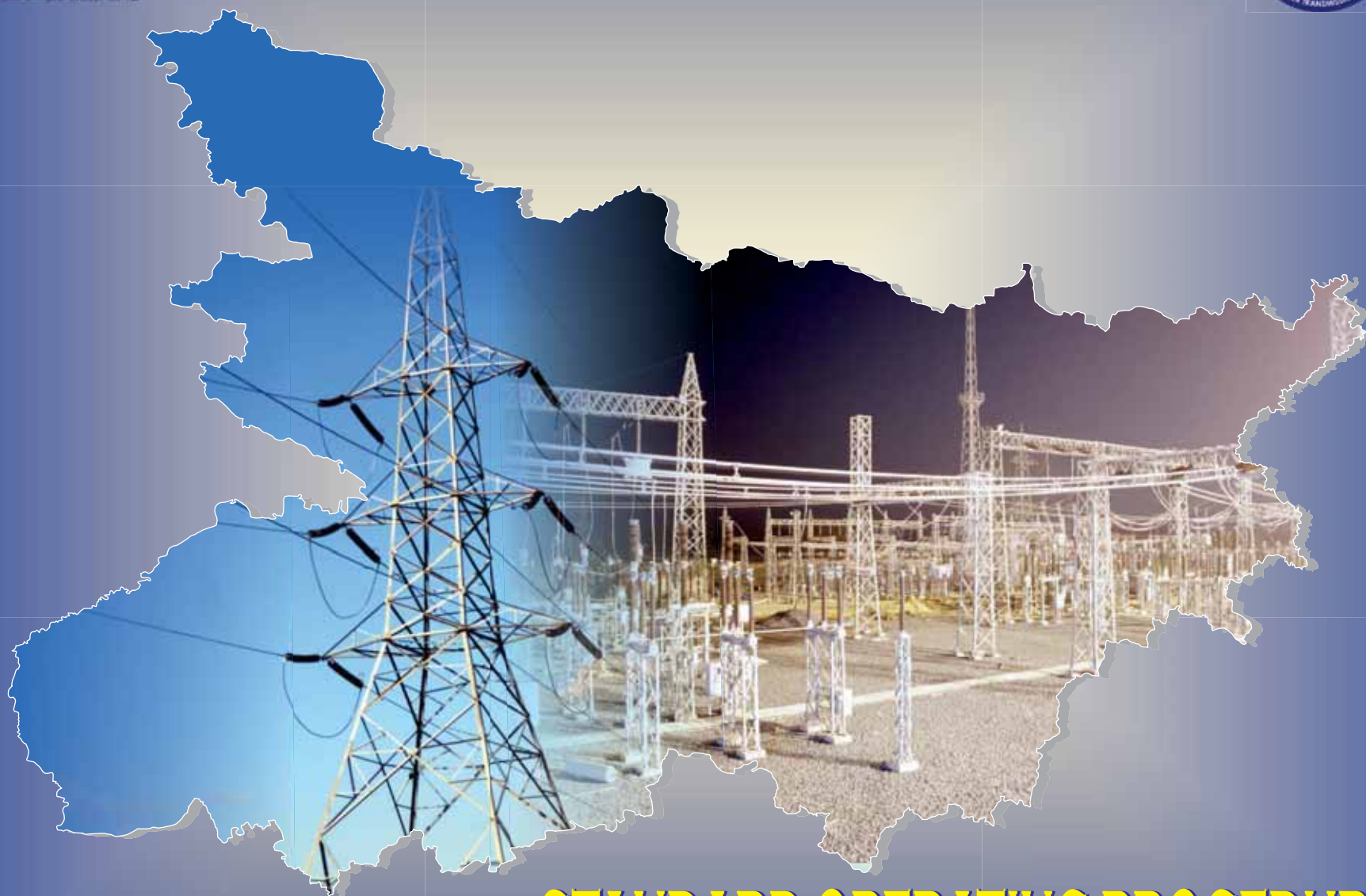




BIHAR STATE POWER TRANSMISSION COMPANY LTD.



STANDARD OPERATING PROCEDURE



Foreword...



*I*t is indeed heartening to know that BSPTCL team has prepared a comprehensive Standard Operating Procedures (SOP) for attending the breakdowns of Grid Sub Stations and Transmission Lines. This is a remarkable effort made to set detailed standard operating procedures for each and every level of Transmission Company, right from an Assistant Executive Engineer to the Chief Engineers.

The SOP contains not only the details of possible defects in transmission system and the officials responsible to rectify them but also the time and information protocol for attending those defects.

I would like to congratulate Mr. Sanjay Kumar Singh, Managing Director and entire BSPTCL team for preparing such a valuable document.

I hope this SOP will certainly act as guide for all the engineers involved in operation and maintenance of transmission systems and will ultimately be helpful in providing quality and uninterrupted power supply to our valued consumers throughout the state.

With best wishes.

Pratyaya Amrit, I.A.S.
Secretary, Energy-cum-CMD, BSP(H)CL

From the desk of the Managing Director...

*T*his is first attempt of BSPTCL to formulate a Standard Operating Procedure (SOP) for attending the breakdowns in transmission system. This SOP will not only be instrumental in rectification of various transmission breakdowns but also will be the key for improving the Asset Availability Factor of the Company. It will also help in providing quality and reliable power to the consumers.

The SOP contains stepwise detail of 'Time and Information Protocol' for attending the breakdowns in Gris Sub Stations and Transmission Lines.

The team of BSPTCL has tried to identify the possible breakdowns in Grid Sub Stations and Transmission Lines. It encompasses even the minor defects such as Replacement of Fuse, Leakages of T-Oils etc along with almost all significant defects likely to cause Transmission Line and Grid Breakdowns.

This SOP prescribes not only a specified time limit for rectification of breakdowns but also pinpoints the responsibility for attending the breakdowns.

Keeping in view the urgency of attending the breakdowns, the limits for financial powers of the concerned officials have also been increased at each level, so that desired work can be accomplished on time.

Trainings and Workshops are being organized to enhance the capacity & potential of transmission engineers and other technical staff to attend the breakdowns. For effective communication, CUG mobiles have been provided to all of them.

A specific direction to comply the SOP has been issued to the Engineers of Transmission Company. The concerned wings of the Company i.e. the Operation & Maintenance teams and Testing & Commissioning teams, both at field and head quarter level have already started to comply with the protocols of the SOP.

As it is our first attempt of framing such SOP, we would like to invite suggestions to make it more effective and useful document in future.



Sanjay Kumar Singh, I.A.S.
Managing Director, BSPTCL

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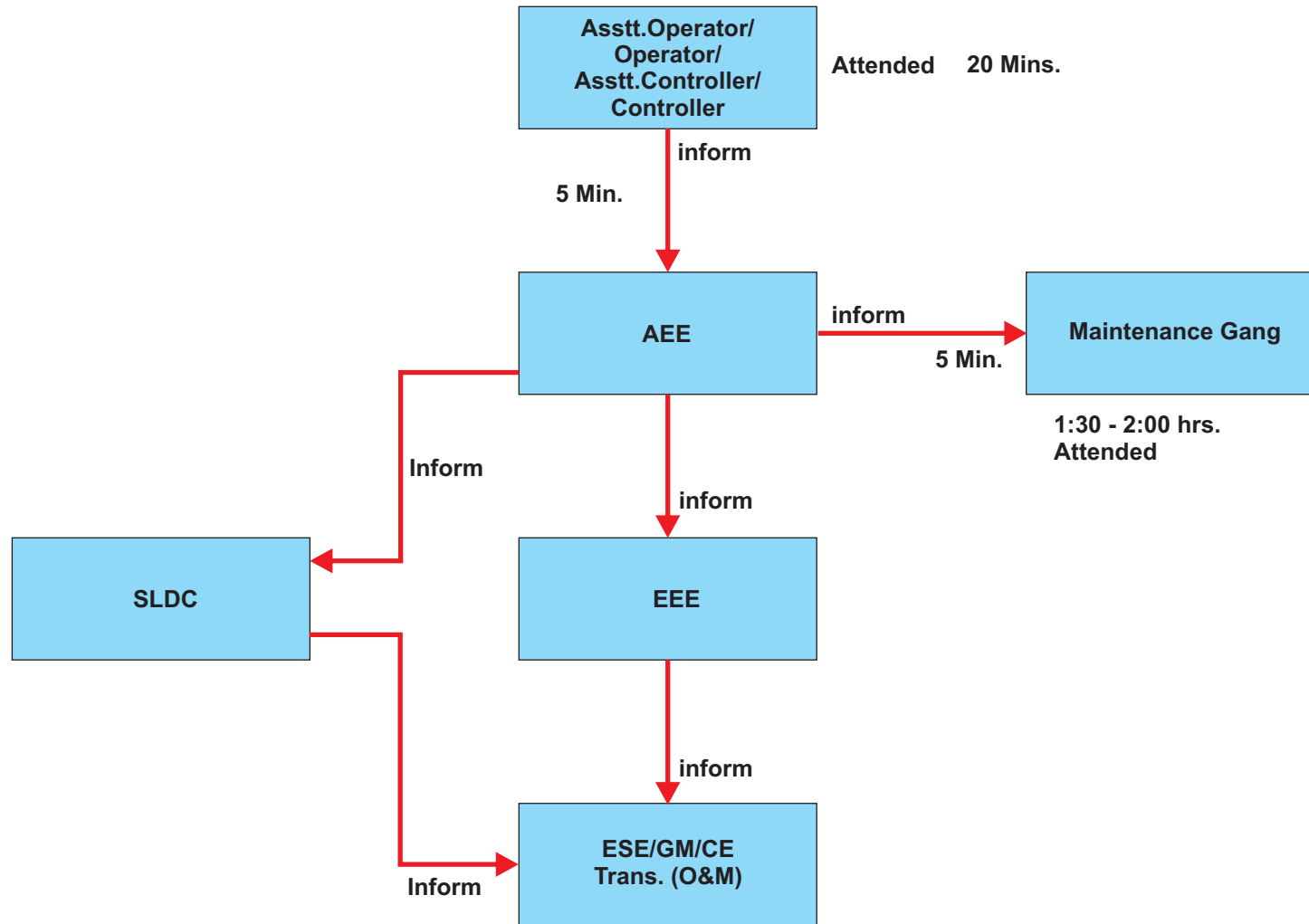
I. Standard Operating Procedure for Breakdown in Grid Sub-Station

SI No.	NAME OF DEFECT	TIME REQUIRED IN RECTIFICATION	RESPONSIBILITY	Remarks
1.	Problem in isolator, melting of isolator tips(male/female)	1:30 -2:00hrs.	AEE & EEE	Subject to availability of spares.
2.	Non-operation of isolator due to electrical and mechanical fault	1:30 -2:00hrs.	AEE & EEE	
3.	Minor oil leakage, Insulator, CT, PT	1:00-1:30 hrs.	AEE & EEE	
4.	Checking/Topping up of oil in transformer, CT, PT & Breaker	1:30 -2:00hrs.	AEE & EEE	If weather is favourable
5.	Problem in closing/opening coil of Breaker	1:00-2:00hrs.	AEE & EEE	Subject to availability of spares coils.
6.	Replacement of burnt motor of Isolator/ Breaker	2:00-3:00 hrs.	AEE and T&C	Subject to availability of spares.
7.	Snapping/cutting/melting of jumper/connectors of C.T, P.T, LA, Breakers, Transformers etc. in GSS	2:00-3:00 hrs.	AEE & EEE	Subject to availability of working gang .
8.	Snapping/cutting of drop jumpers of line in GSS	2:00-4:00 hrs.	AEE & EEE	After arrival of maintenance gang.
9.	Checking/ measuring of C.T.,PT, LA & Breaker	3:00-4:00 hrs.	AEE ,EEE,ESE and T&C	After arrival of T&C team
10.	Checking of operating circuit of Breaker	2:00 3:00 hrs.	AEE ,EEE,ESE and T&C	After arrival of T&C team

SI No.	NAME OF DEFECT	TIME REQUIRED IN RECTIFICATION	RESPONSIBILITY	Remarks
11.	Meggering of control cable	2:00-3:00 hrs.	AEE ,EEE,ESE and T&C	After arrival of T&C team
12.	Replacement of control cable	3:00-4:00 hrs.	AEE ,EEE and T&C	After arrival of T&C team
13.	Checking of Relay Master Trip/Over voltage/over current/earth fault/differential protection, distance protection.	4:00-5:00 hrs.	AEE,EEE,ESE,T&C and CRITL	After arrival of T&C and CRITL team
14.	Alarm circuit of Low oil level winding temp., oil temp., Buchholz relay	2:00-4:00 hrs.	AEE,EEE,T&C and CRITL	After arrival of T&C and CRITL team
15.	Tap changer problem	2:00-4:00 hrs.	AEE,EEE,ESE,T&C and CRITL	After arrival of T&C and CRITL team
16.	Replacement of burnt/burst CT,PT & LA	6:00-8:00 hrs.	AEE , EEE and T& C	subject to availability of spares at site

NOTE : Whenever a shutdown of equipment or bay is taken, the related others works must be completed within the same shutdown period.

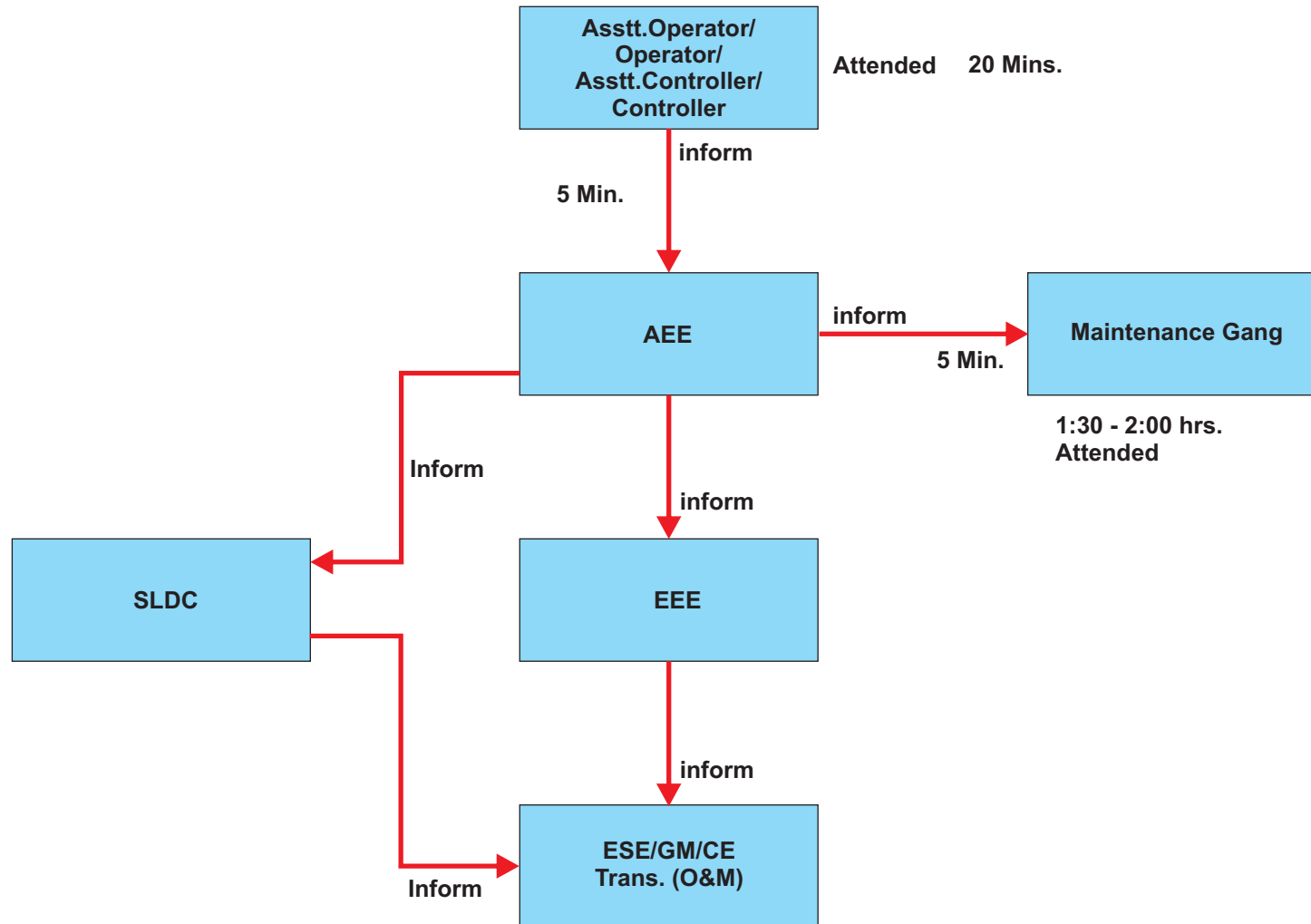
1. PROBLEM IN ISOLATOR, MELTING OF ISOLATOR TIPS (MALE/FEMALE)



Subject to availability of spares

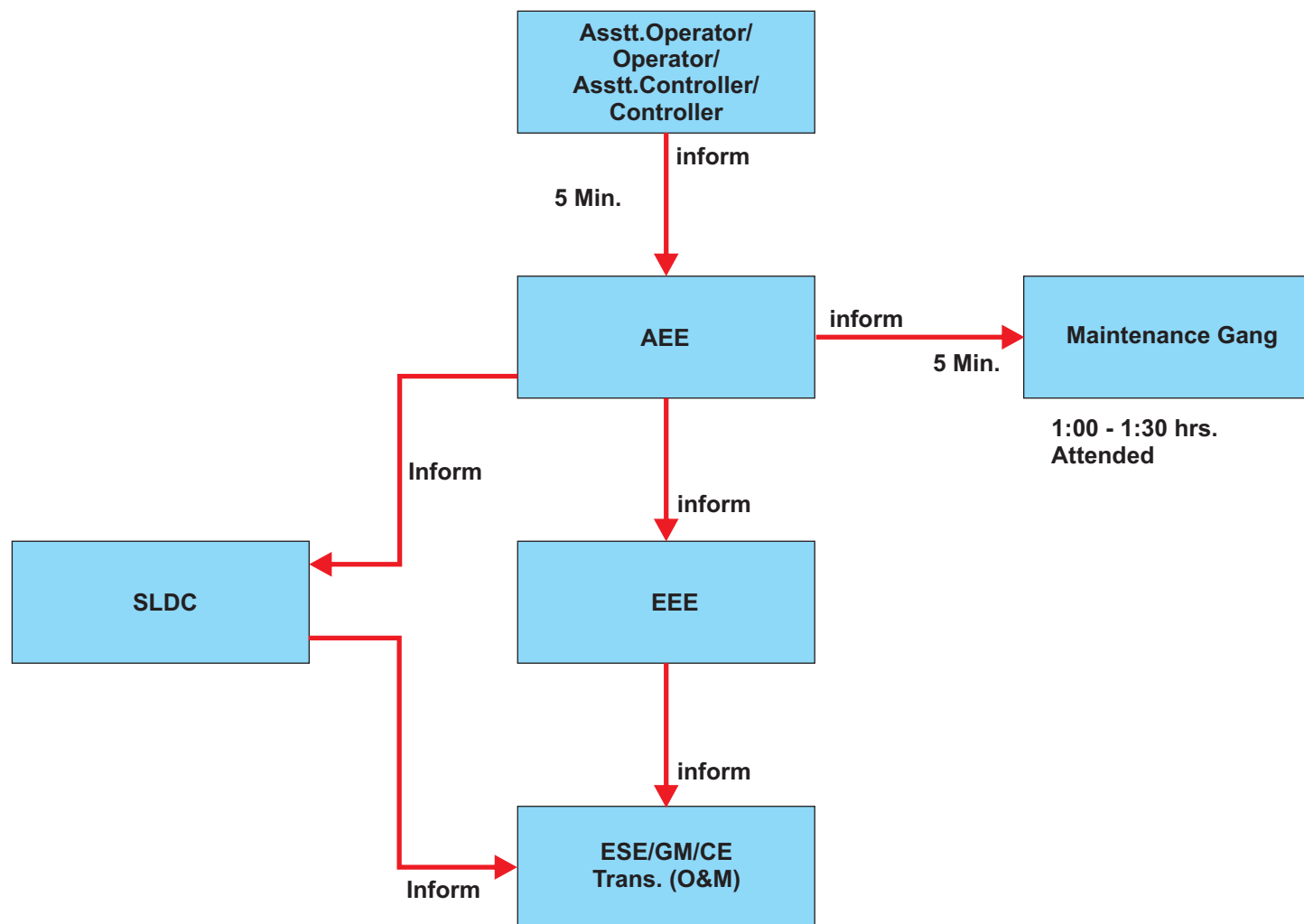
NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

2. NON-OPERATION OF ISOLATOR DUE TO ELECTRICAL AND MECHANICAL FAULT



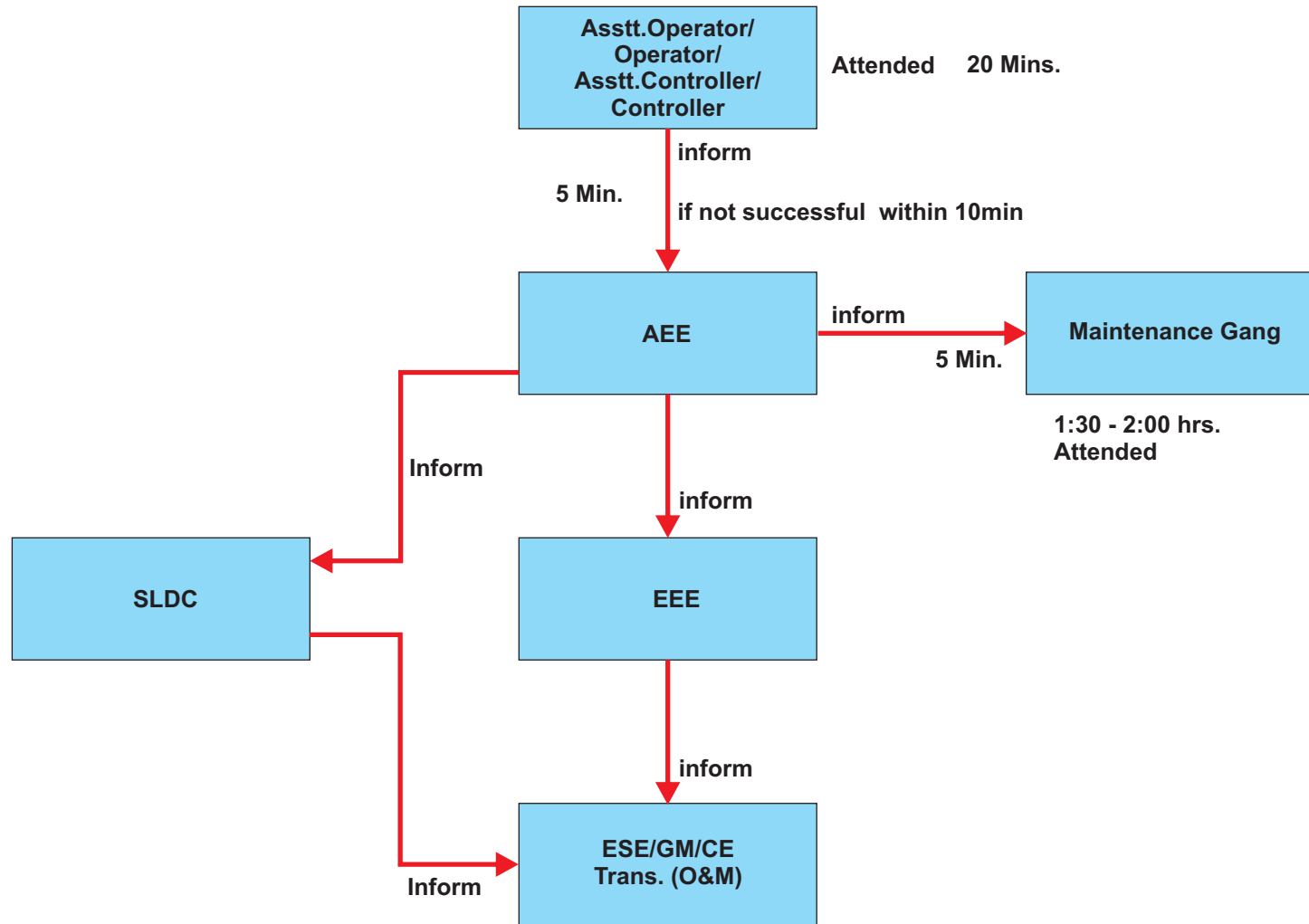
NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

3. ATTENDING MINOR OIL LEAKAGE FROM CT, PT, TRANSFORMER & BREAKER



NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

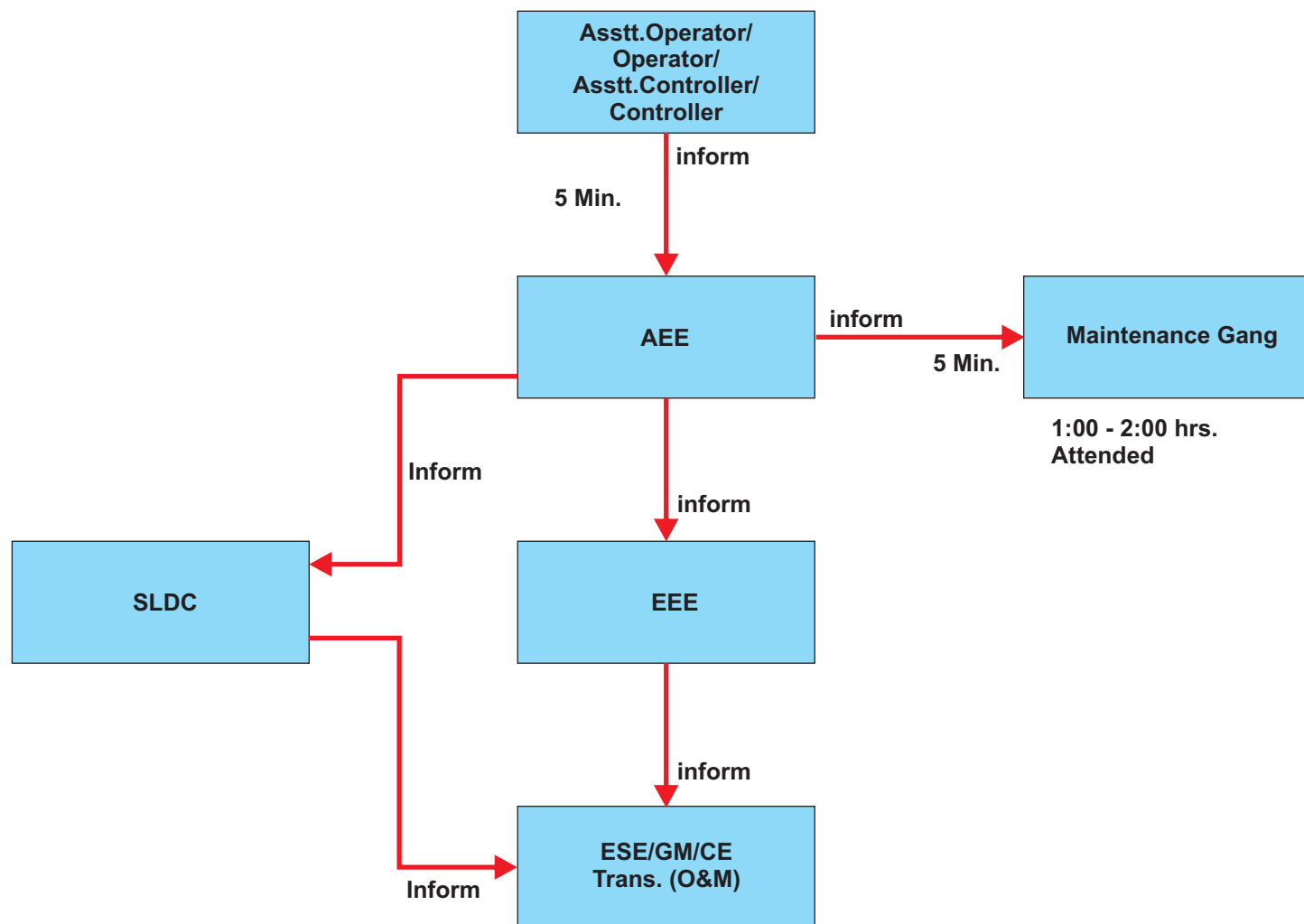
4. CHECKING/TOPPING OF OIL IN TRANSFORMER CT, PT & BREAKER



Subject to favorable weather condition

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

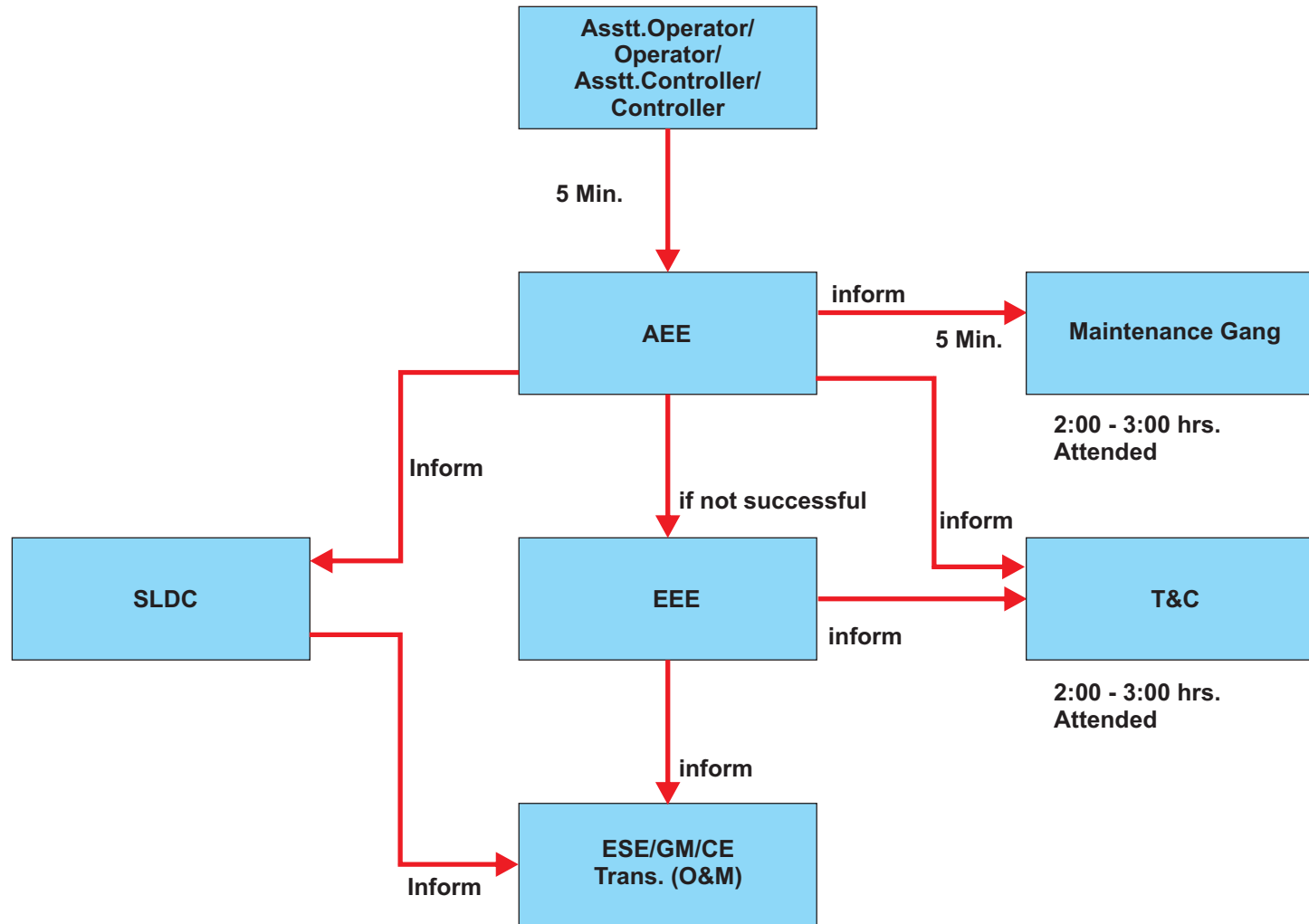
5. PROBLEM IN CLOSING/OPENING COIL OF BREAKER



Subject to availability of spares coils

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

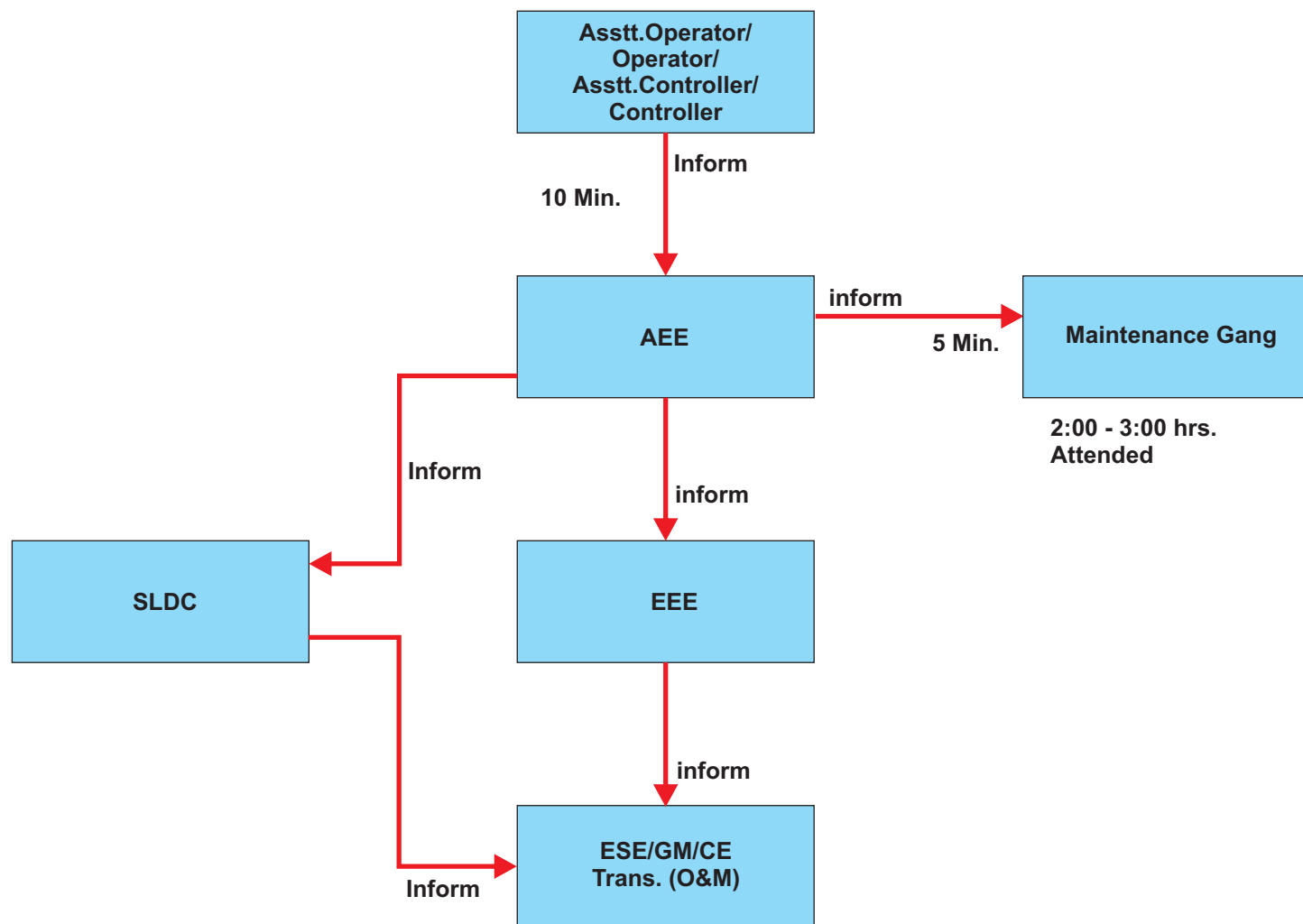
6. REPLACEMENT OF BURNT MOTOR OF ISOLATOR/BREAKER



Subject to availability of spares

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

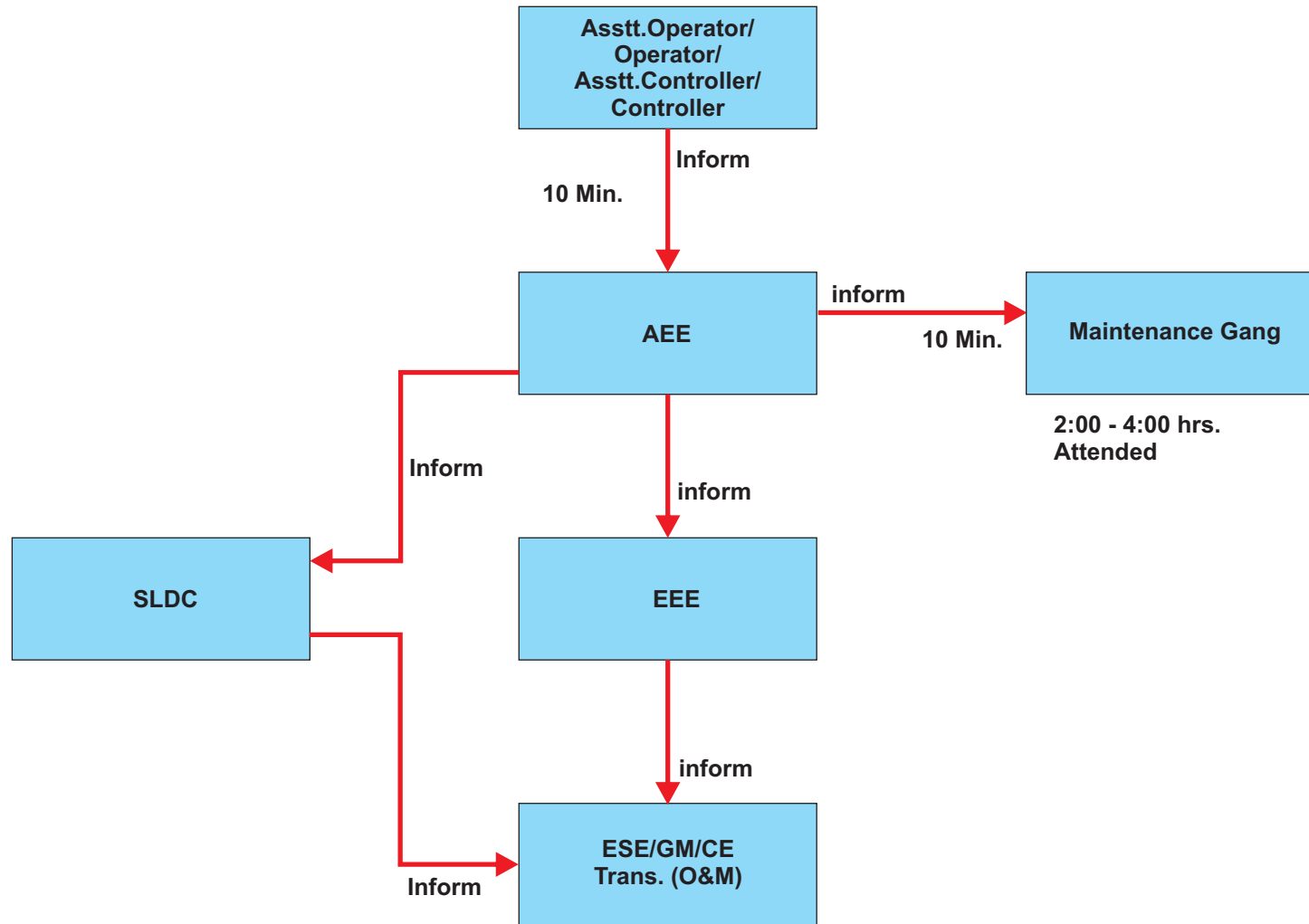
7. SNAPPING/CUTTING/MELTING OF JUMPER/CONNECTORS OF CT, PT, LA, BREAKERS AND TRANSFORMERS, Etc. IN GSS



Subject to availability of working gang

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

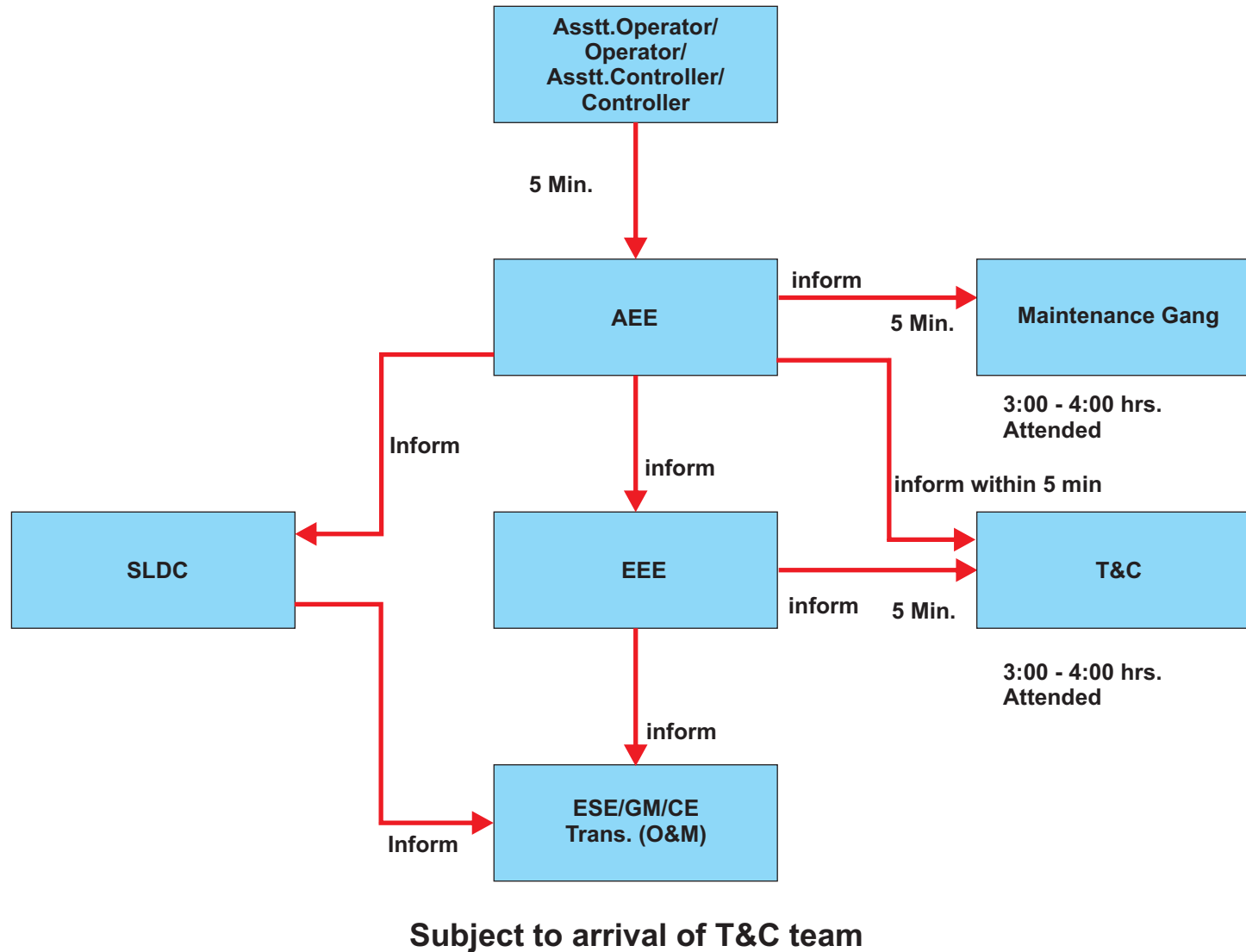
8. SNAPPING/CUTTING OF DROP JUMPERS OF LINE IN GSS



Subject to arrival of maintenance gang

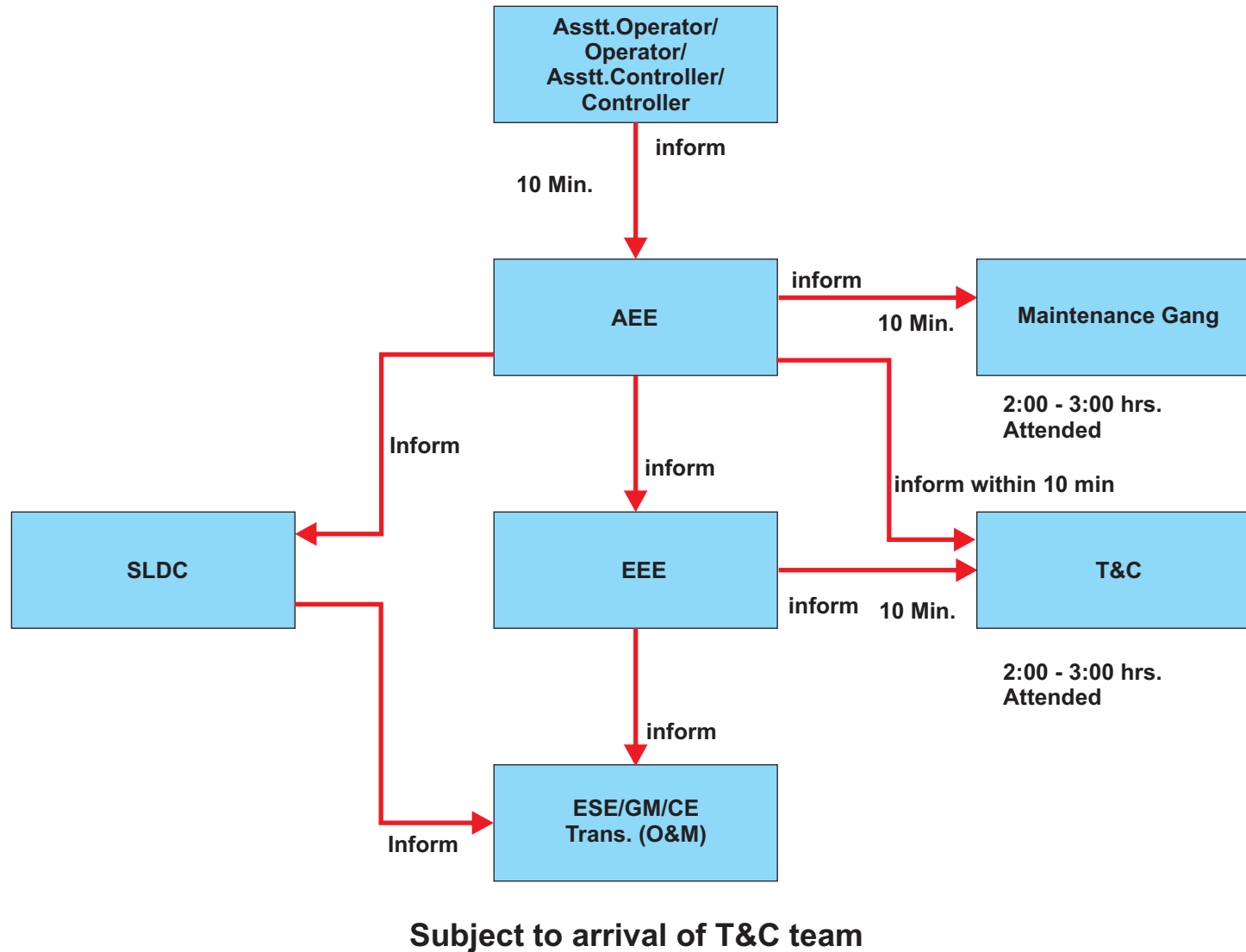
NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

9. CHECKING/MEASURING OF CT, PT, LA & BREAKER



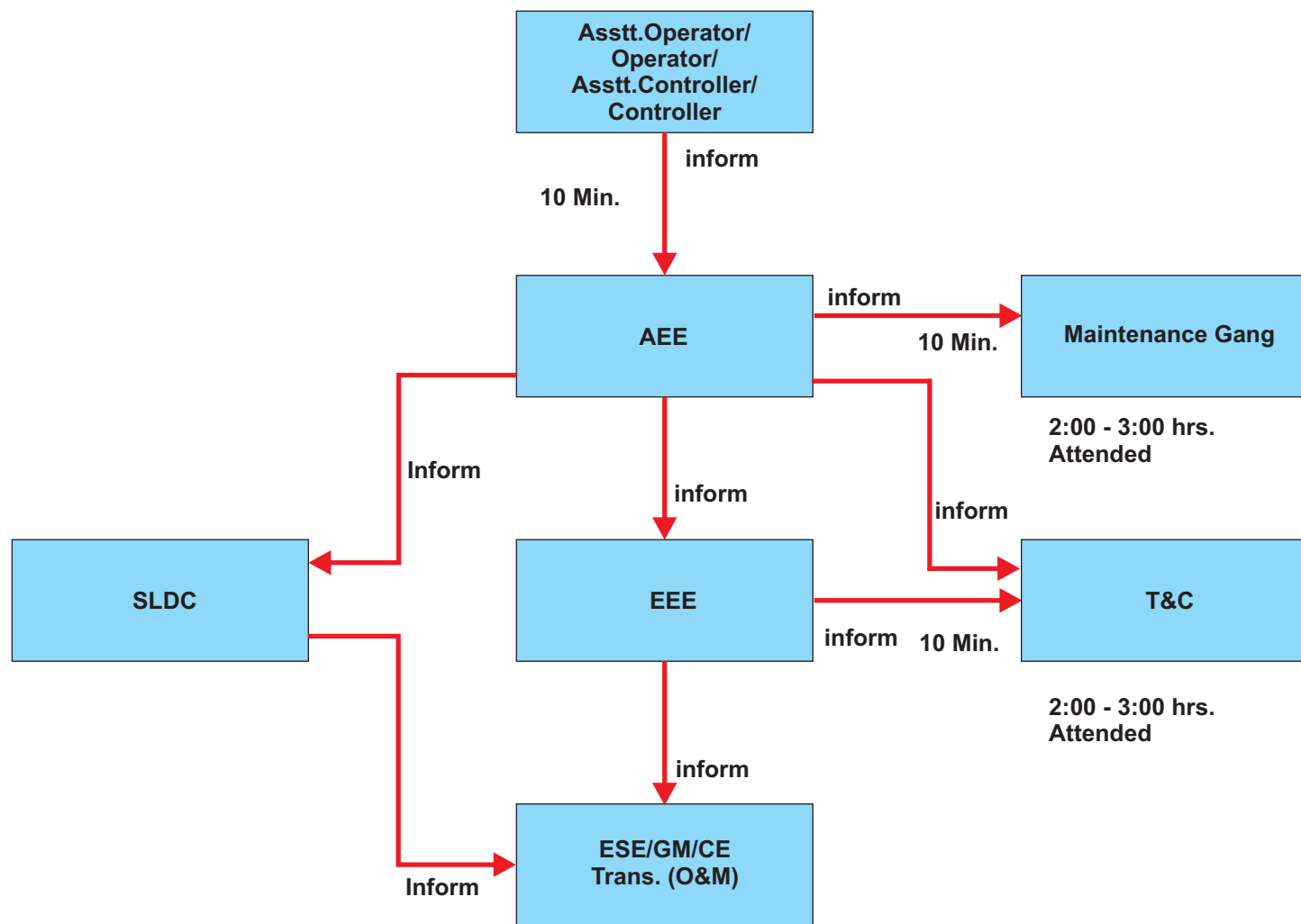
NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

10. CHECKING OF OPERATING CIRCUIT OF BREAKER



NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room

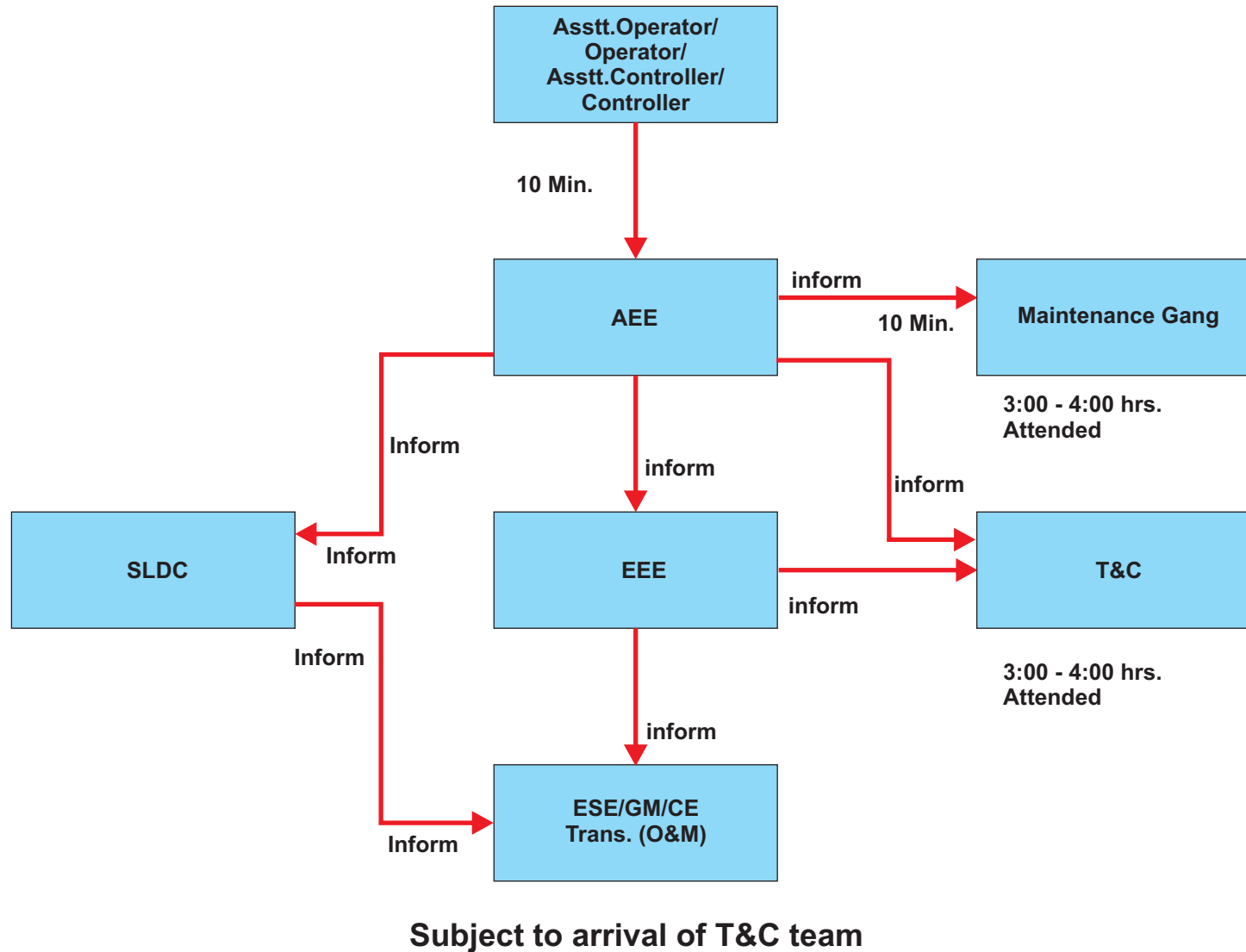
11. MEGGERING OF CONTROL CABLE



Subject to arrival of T&C team

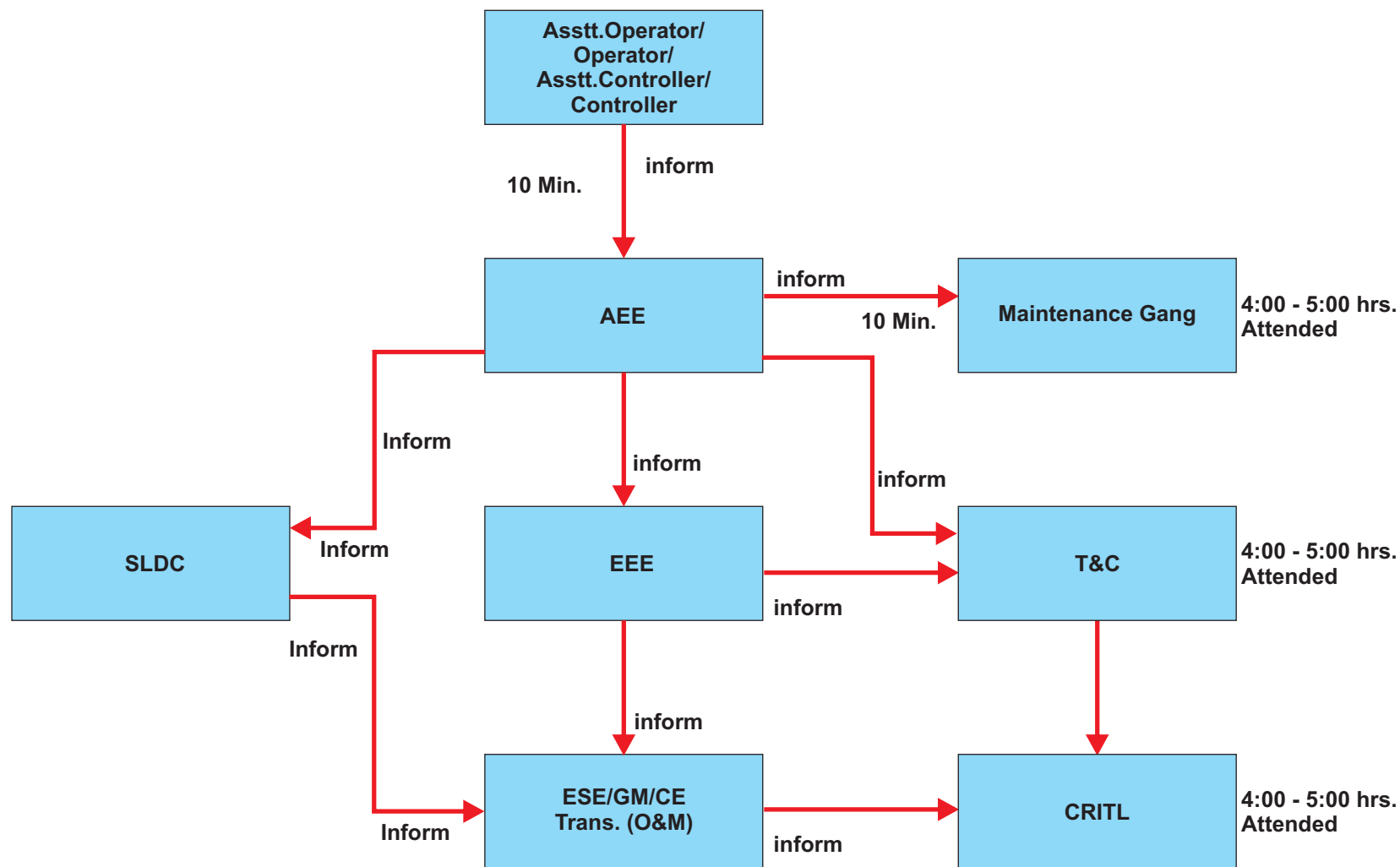
NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

12. REPLACEMENT OF CONTROL CABLES



NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

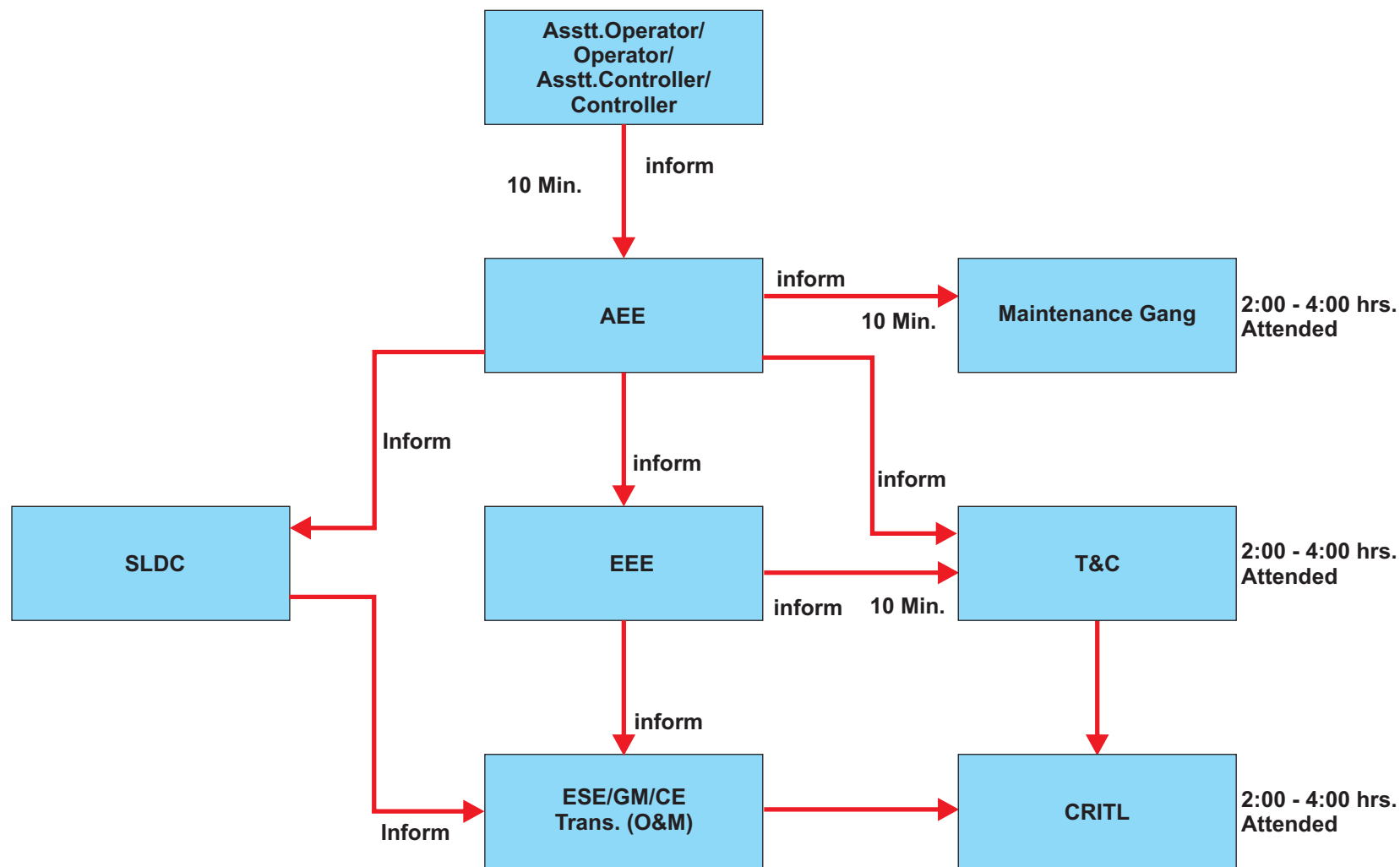
13. CHECKING OF RELAY-MASTER TRIP/OVER VOLTAGE/OVER CURRENT/ EARTH FAULT/DIFFERENTIAL PROTECTION/DISTANCE PROTECTION, Etc.



Subject to arrival of T & C and CRITL team

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

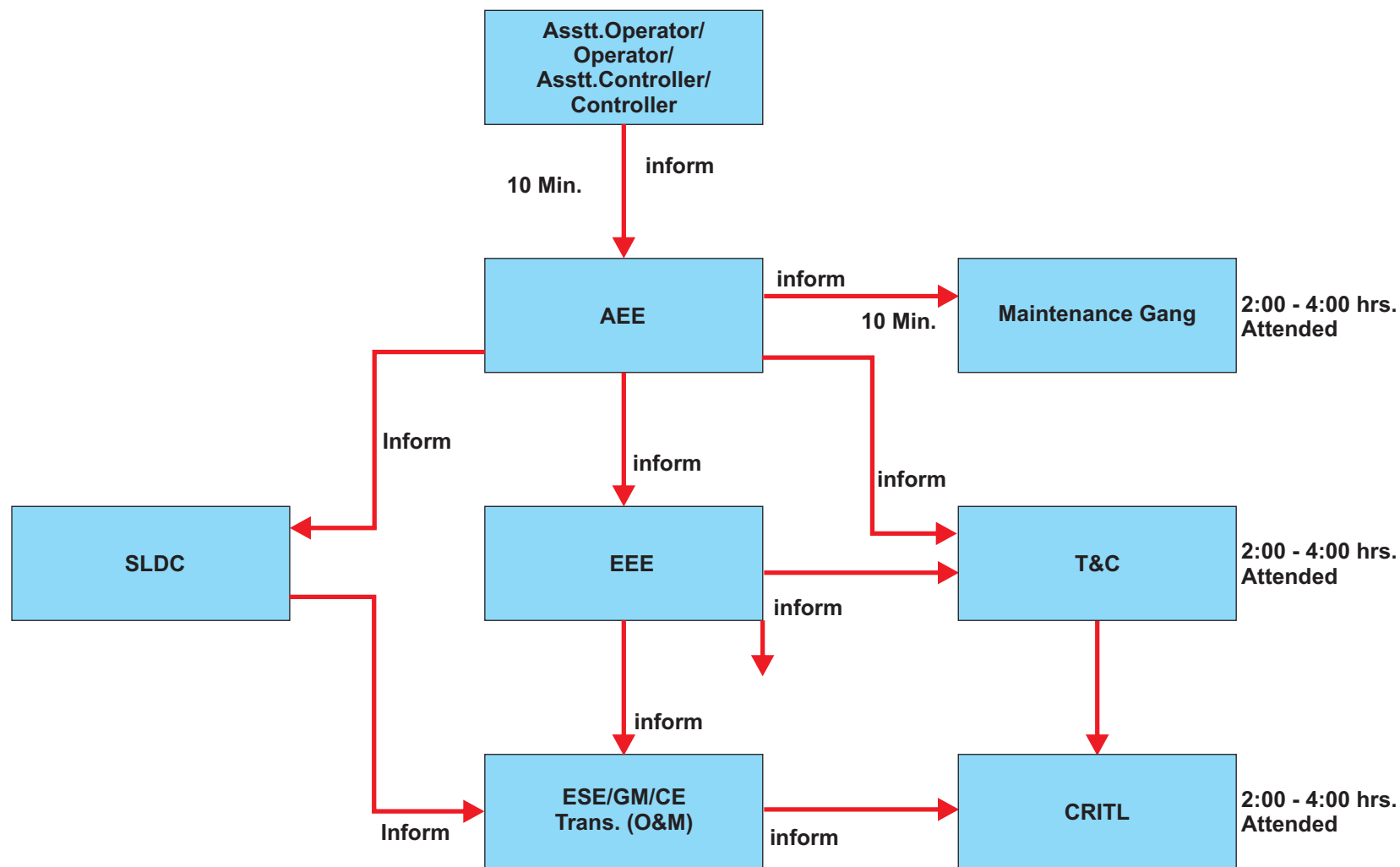
14. ALARM CIRCUIT OF LOW OIL LEVEL, WINDING TEMPERATURE, OIL TEMPERATURE, BUCHHOLZ RELAY, Etc.



Subject to arrival of T & C and CRITL team

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

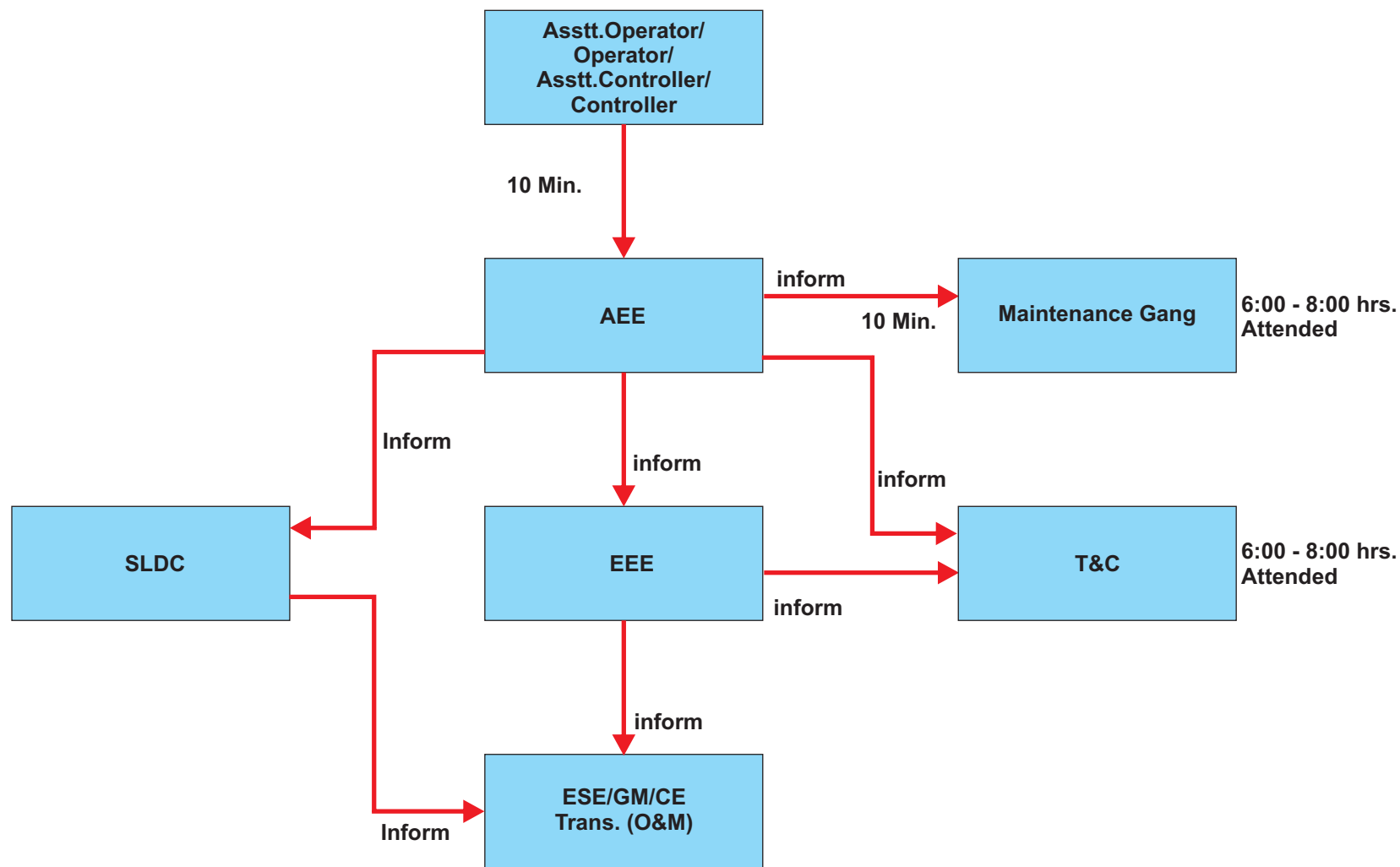
15. TAP CHANGER PROBLEM



Subject to arrival of T & C and CRITL team

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

16. REPLACEMENT OF BURNT/BURST CT, PT & LA



Subject to availability of spares at sites

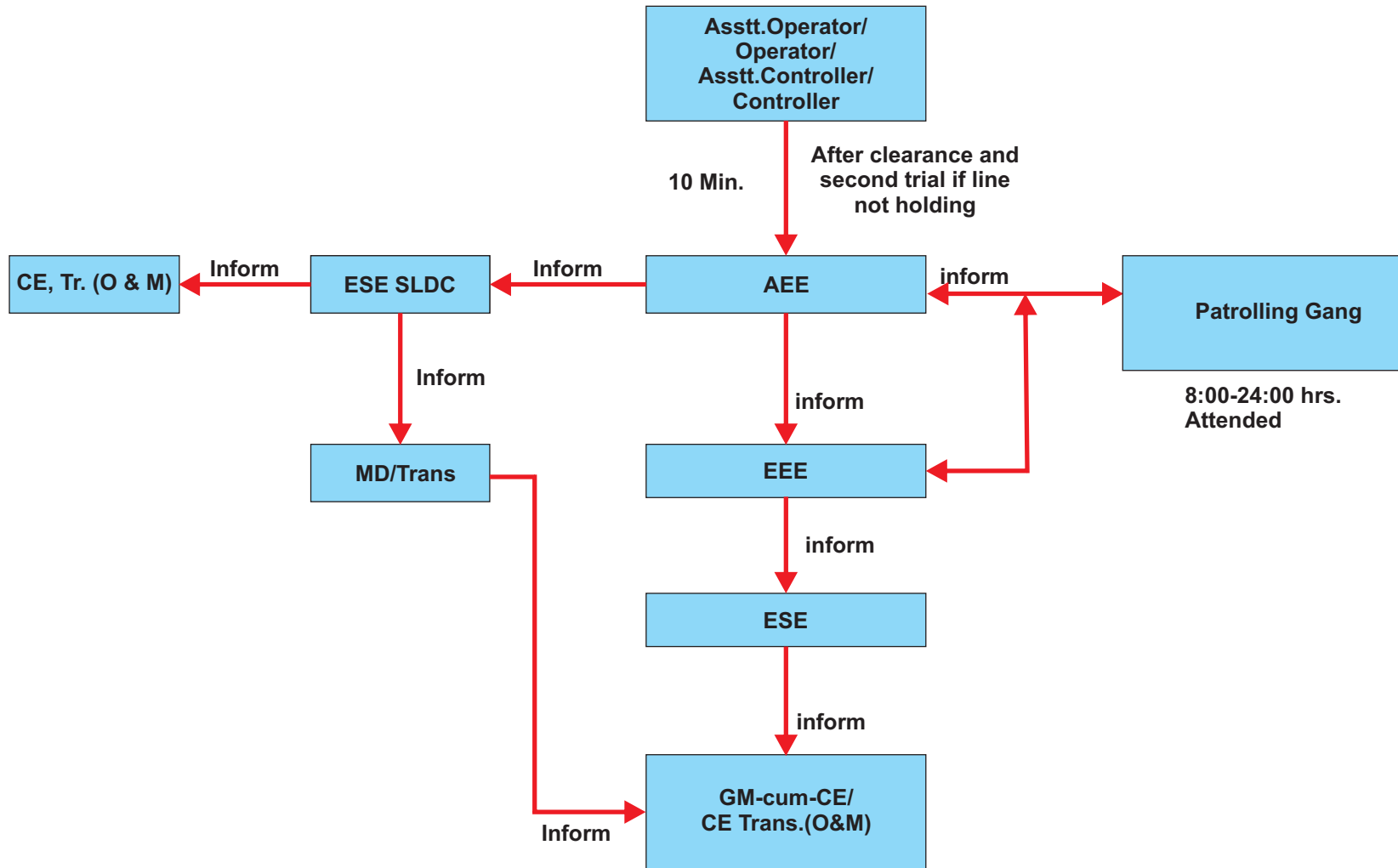
NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will Inform to concerned D.M Control Room.

II. Standard Operating Procedure for Break Down in Transmission Line

SI No.	NAME OF DEFECT	TIME REQUIRED IN RECTIFICATION	RESPONSIBILITY	Remarks
1.	Patrolling of Tr. Line, Insulators and towers	8:00-24:00 hrs.	AEE	subject to visibility and manpower
2.	Repair/ replacement of conductors, earth wire & insulator	12:00-24:00 hrs.	AEE & EEE	subject to availability of spares, agency and weather/site conditions.
3.	Replacement of burnt Jumper in line	4:00-6:00 hrs.	AEE & EEE	Subject to availability of agency
4.	Fitting of Missing tower member	6:00-8:00 hrs.	AEE	Subject to availability of spares
5.	Repair, Erection of damage /bent towers	4-5days	AEE to GM	subject to availability of spares and agency
6.	Erection /repair of tower leg	15-20 days	AEE to GM	After arrival of agency & availability of spares
7.	Pruning/cutting of tree branches and bushes near transmission line.	6:00-8:00 hrs	AEE	On daily basis depending upon the line length
8.	Thermo vision must be taken on monthly basis and rectification to be done accordingly		AEE	

NOTE : Whenever a shutdown of equipment or bay is taken, the related others works must be completed within the same shutdown period.

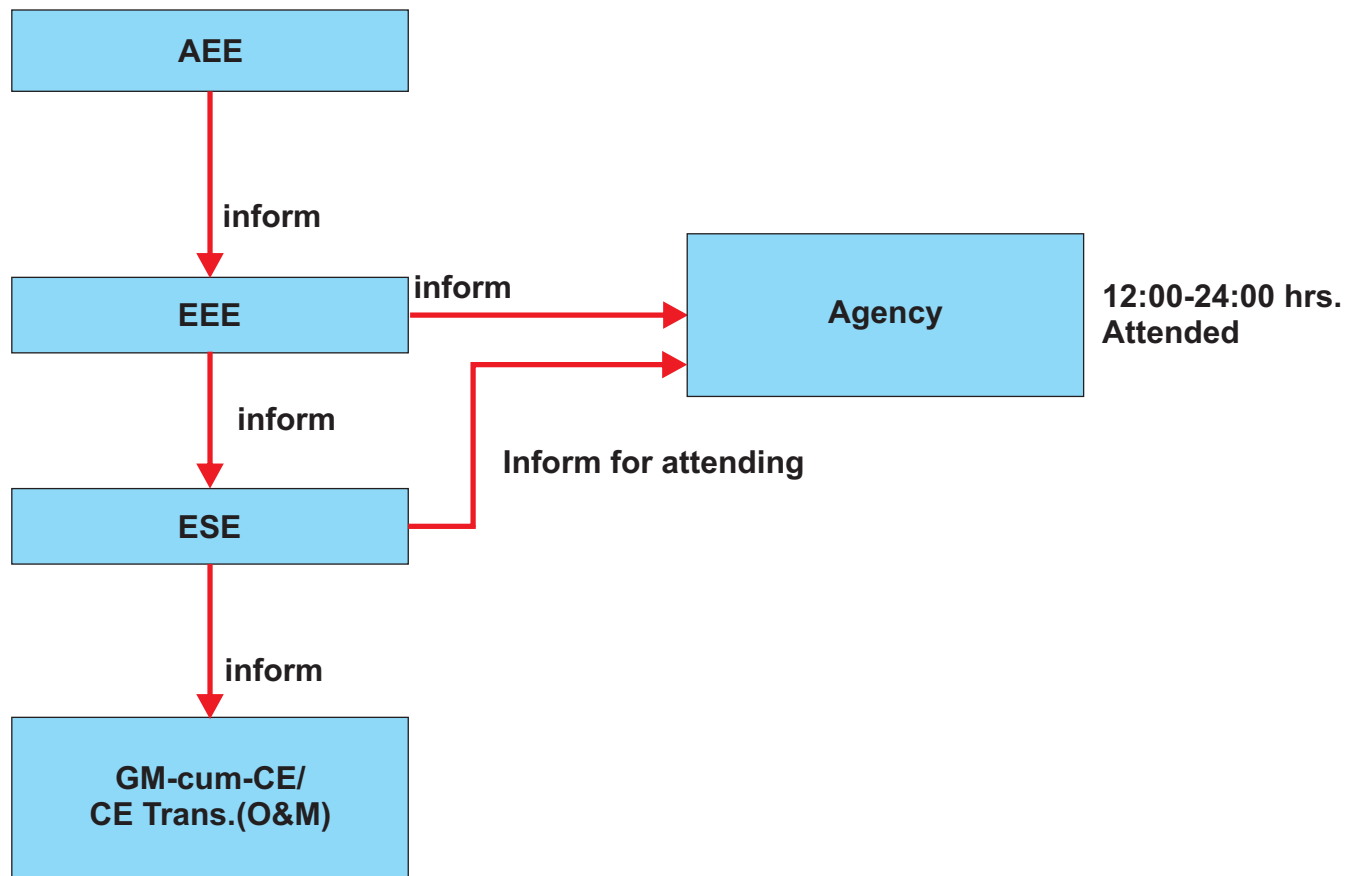
1. PATROLLING OF TRANSMISSION LINE, INSULATOR AND TOWERS



Subject to visibility and manpower

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

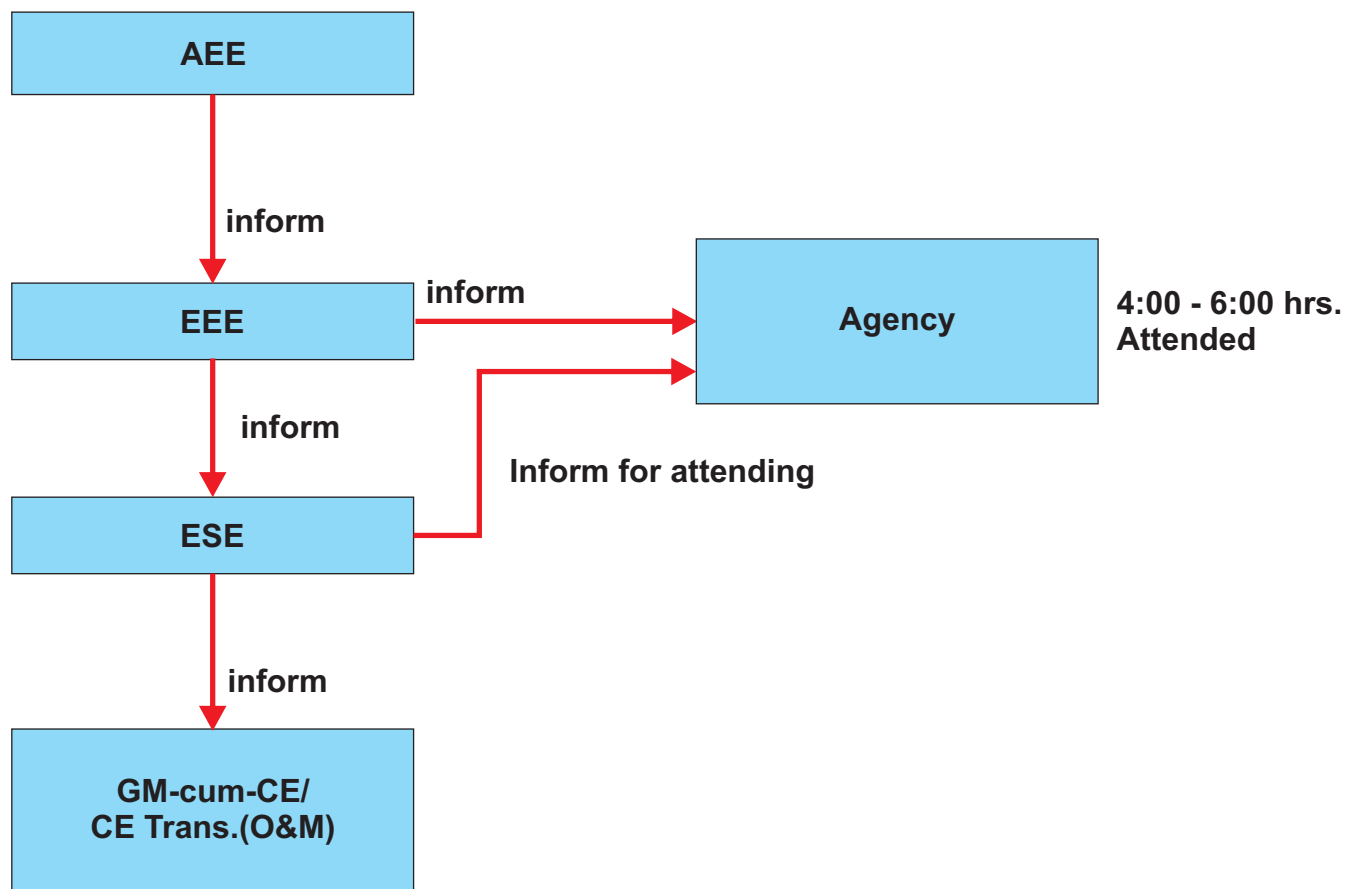
2. REPAIR/REPLACEMENT OF CONDUCTORS, EARTH WIRE AND INSULATOR



Subject to availability of spares, agency and weather/site condition

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

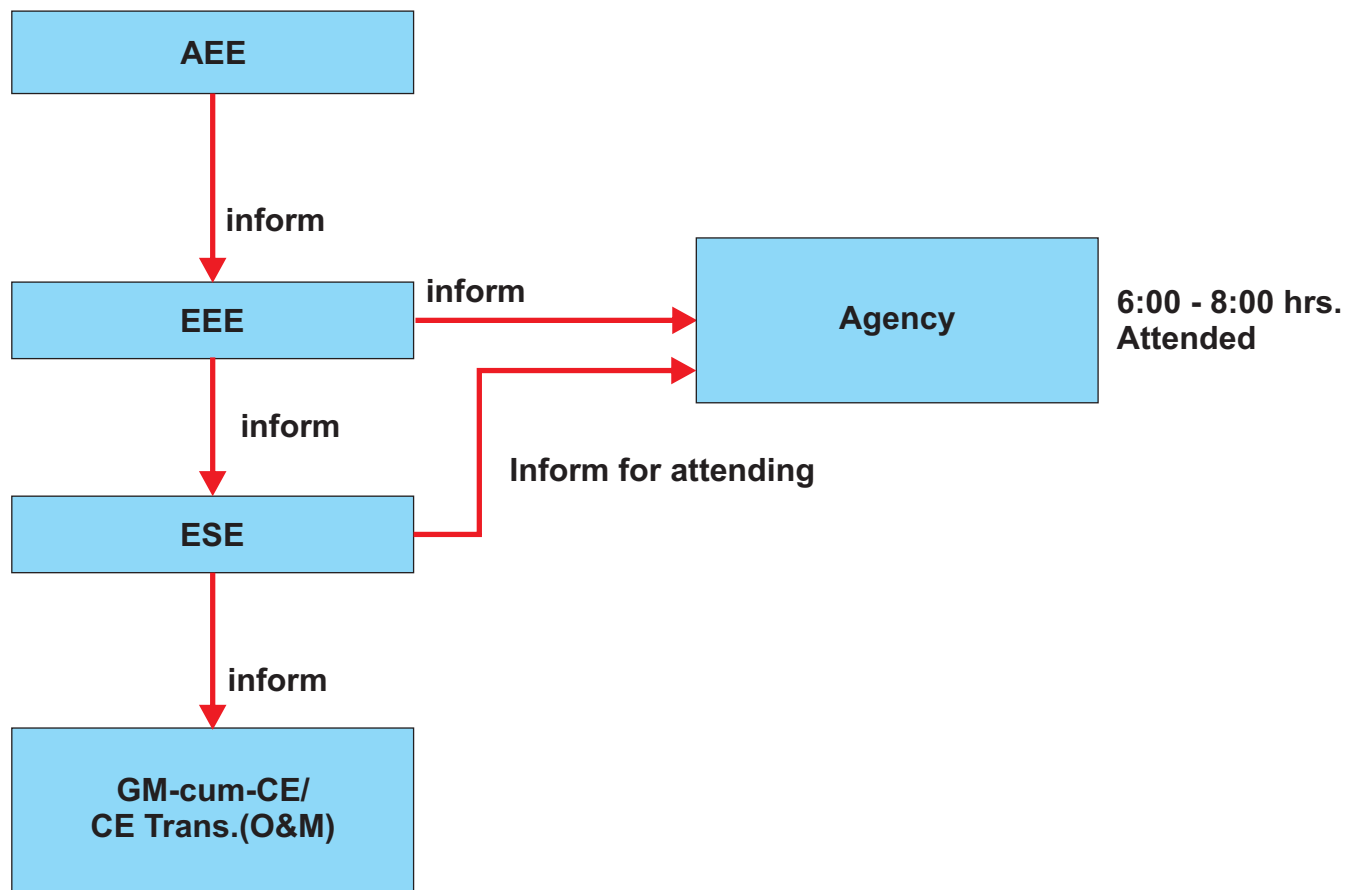
3. REPLACEMENT OF BURNT JUMPER IN LINE



Subject to availability of agency

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

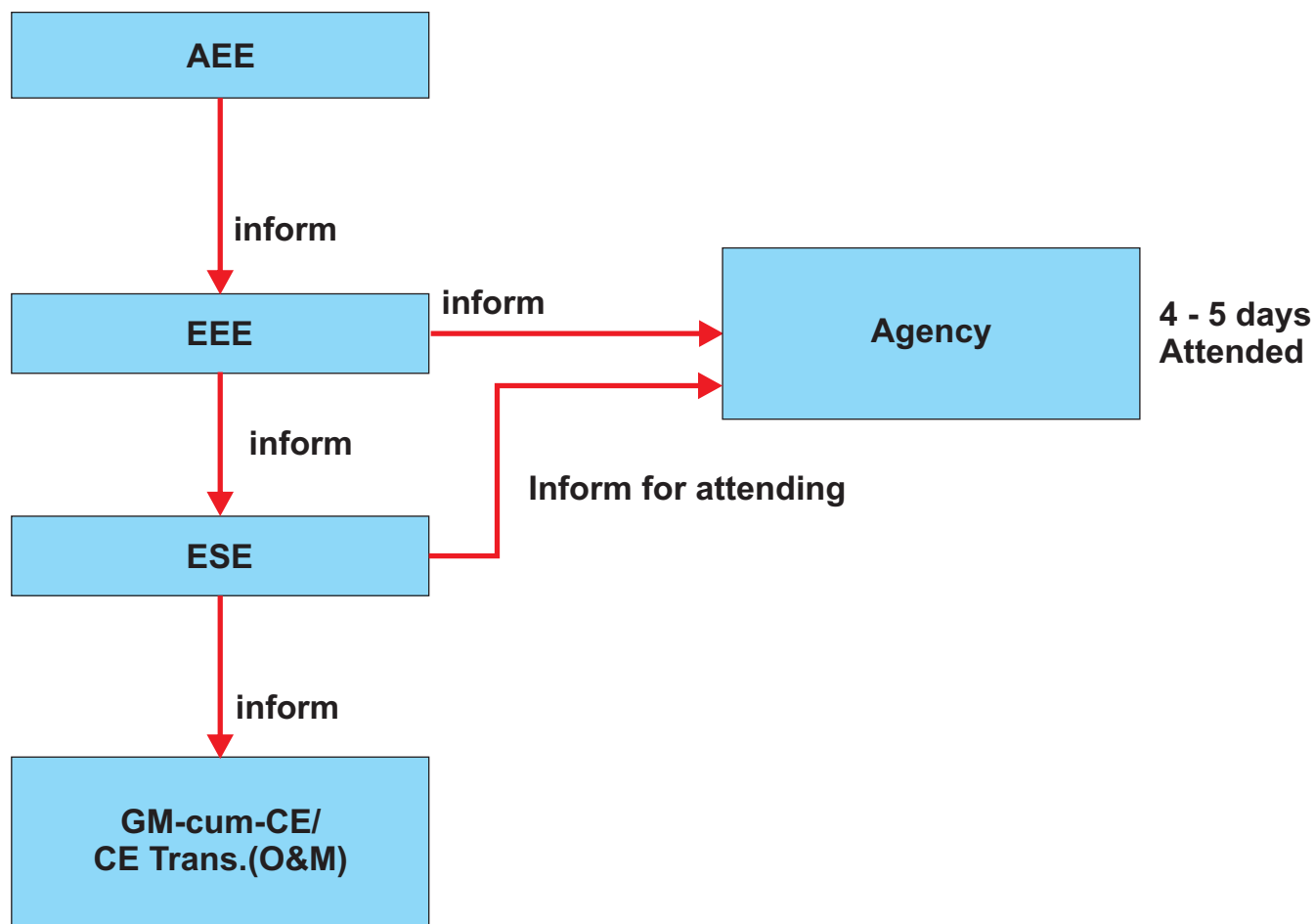
4. FITTING OF MISSING TOWER MEMBER



Subject to availability of spares

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

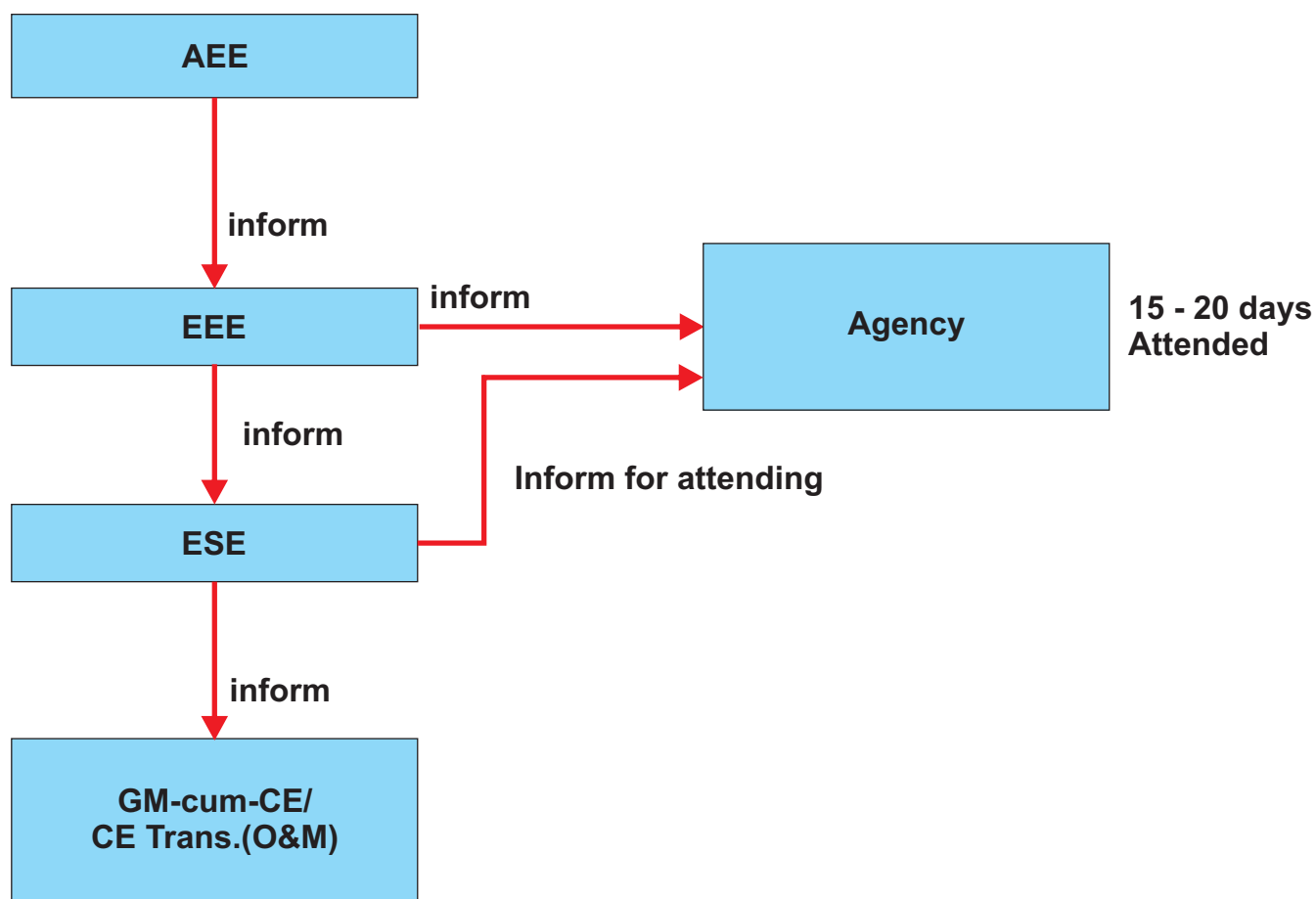
5. REPAIR, ERECTION OF DAMAGE/BENT TOWERS



Subject to availability of spares and agency

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

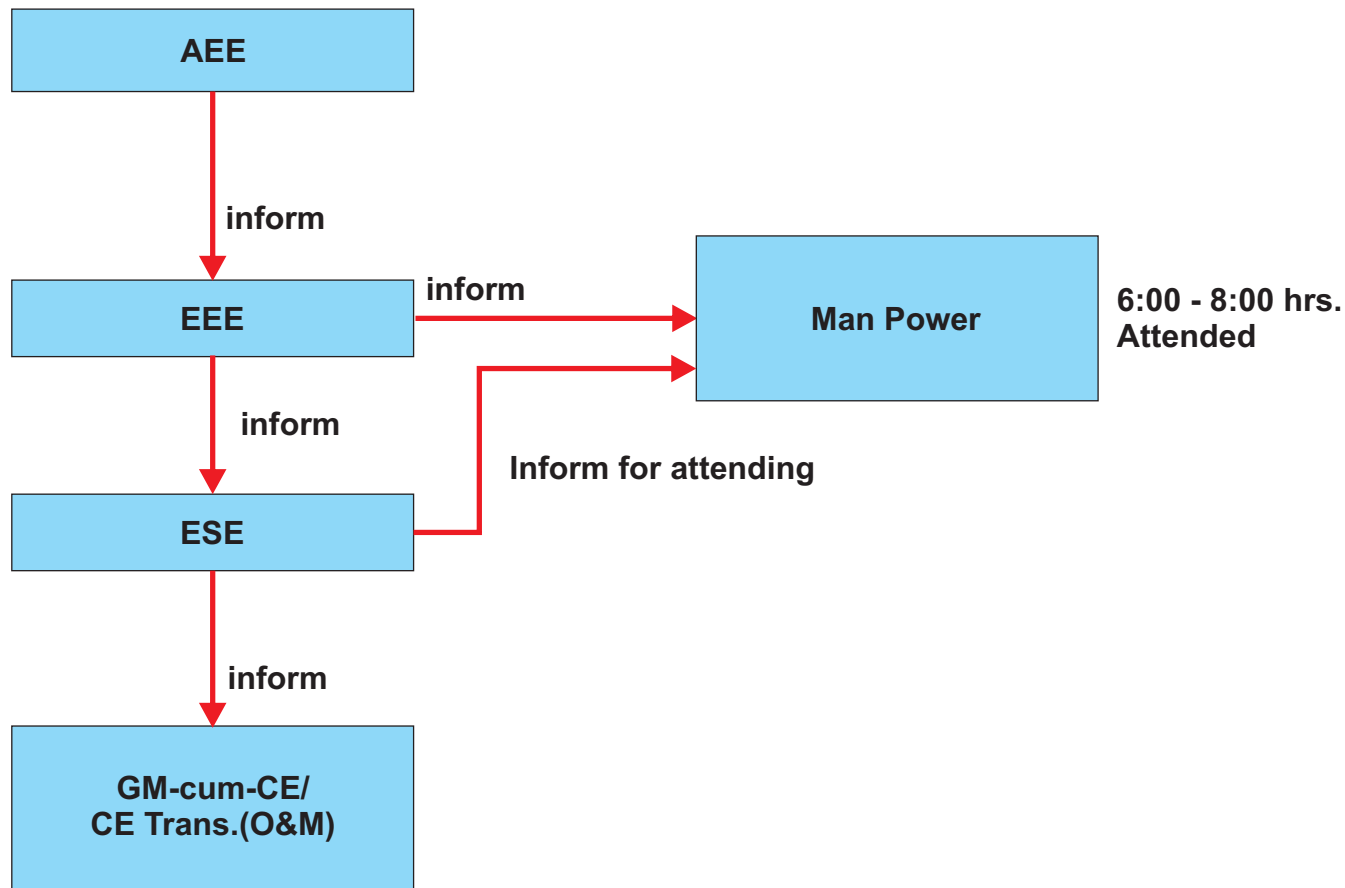
6. ERECTION/REPAIR OF TOWER LEG



Subject to availability of spare and arrival of agency

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

7. PRUNING/CUTTING OF TREE BRANCHES AND BUSHES NEAR TRANSMISSION LINES



Subject to daily basis depending upon the line length

NOTE : In case of failure of transmission line/grid sub-station for more than 30 mins, concerned GM-cum-CE/ESE will inform to concerned D.M Control Room.

8. THERMO VISION REPORT

**THERMO VISION MUST BE TAKEN ON MONTHLY BASIS AND
RECTIFICATION TO BE DONE ACCORDINGLY**



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED, PATNA
Regd. Office :- Vidyut Bhawan, Bailey Road, Patna-21

Letter No.....1944...../Patna,

Date.....30.06.2014..../

From,

Sanjay Kumar Singh,
Managing Director.

To,

G.M.-cum-C.E.,
Transmission Zone Patna/Muzaffarpur.
Electrical Superintending Engineer,
Transmission Zone, Patna/Muzaffarpur/Purnea/Dehri-on-Sone/
Bhagalpur/Biharsharif/Gaya.
All Electrical Executive Engineer,
Transmission Division.
All Assistant Executive Engineer,
Transmission Sub-division/Sub-stations.

Sub : Strict Compliance of Standard Operating Procedure (SOP) issued and circulated to all.

Sir,

As you are aware that, SOP related with maximum time limit allowed for restoration of break down in GSS Switch Yard equipments, Bus Bars, Jumpers and also of Transmission lines, Towers etc., has been prepared and circulated to all Transmission Zones/ Circles/ Divisions/Sub-divisions for its compliance. But it has been found that this SOP is only on paper and concerned Executive Engineers/Assistant Engineers are not adhering to the time limits as specified in SOP.

To enforce SOP in its true perspective, you all are hereby again directed to maintain the maximum time limits as has been fixed in the SOP. In case of any deviation the following action will be taken as detailed given below :

1. AEE : (i) One yellow card for each delay in restoration of Breakdown.

(ii) One red card after issue of four yellow cards with initiation of Departmental Proceeding.

2. EEE : (i) One yellow card for every two yellow cards issued to his AEE's.
(ii) One red card after issue of four yellow cards with initiation of Departmental Proceeding.
3. ESE : (i) One yellow card for every two yellow cards issued to his EEE's.
(ii) One red card after issue of four yellow cards with initiation of Departmental Proceeding.
4. G.M.-cum-C.E., Trans. Zone : (i) One yellow card for every two yellow cards issued to his ESE's.
(ii) One red card after issue of four yellow cards with initiation of Departmental Proceeding.
5. C.E., Trans. (O & M), HQ.: (i) One yellow card for every two yellow cards issued to any G.M.-cum-C.E., Trans. Zone, Patna / Muzaffarpur.
(ii) One red card after issue of four yellow cards with initiation of Departmental Proceeding.

After issue of one yellow card, the concerned officer will submit a detail report about the cause of delay. In case his explanation is accepted, his yellow card will be withdrawn.

Yours faithfully,
Sd/-
(Sanjay Kumar Singh)
Managing Director

Memo No...../Patna,

Date...../

Copy forwarded to Director (Projects), BSPTCL, Patna/ C.E. (Transmission) / C. E., Trans. (O & M) / DGM (HR & Adm.), BSPTCL, Patna for kind information & necessary action.

Sd/-
(Sanjay Kumar Singh)
Managing Director





**Bihar State Power
Transmission Company Ltd.**
Vidyut Bhawan, Bailey Road, Patna