

Auto Mains Failure System Control For Power Plant Applications Using Plc

P.Dhivya¹, M.Iswariya², R.Kalaivizhi³, S. Sivasakthi⁴, P. Sakthikumar⁵
 Department of Electrical And Electronics Engineering
 1, 2, 3, 4, 5 Krishnasamy College Of Engineering And Technology

Abstract- It is imperative that the power to unit auxiliaries (to light up boiler and associated auxiliaries) is highly required. The unit bus scheme normally split up into two categories. The details regarding 0.4 KV Unit/Emergency bus schemes with Circuit breakers and Protections will be there in Unit auxiliary scheme shown as in diagram. The supply in Emergency bus scheme should be kept 'ON' at all times. In case of interruption it has to be recovered as early as possible. If recovery time going beyond 17 seconds, the main generation will be reduced gradually- causes major revenue loss. Since both the emergency bus loads were tie-up with private DG system called AMF system.

I. OBJECTIVES

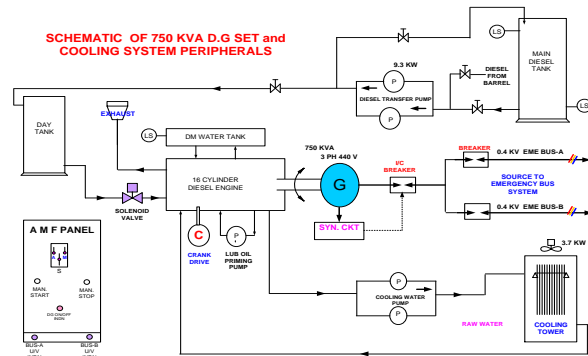
To give 0.4kv power supply to the emergency. To provide an impulse for closing incomer breaker as soon as rated voltage and frequency are achieved. Starting up of its own water circulating pumps and cooling tower fans- after the closing of incomer breaker.

II. INTRODUCTION

An emergency power system or Auto Mains Failure System is a standby generator to provide backup power resources in a crisis or when regular systems fail. They find uses in a wide variety from hospitals, scientific laboratories, data centers, telecommunication equipment and modern equipment and modern naval ships, Airports, small and Large scale Industries. In recent years, large units of power stations are usually designed on a unit system basis. A unit is the Steam Boiler (B) supplies steam to a Steam Turbine (T) which in turn connected with a Generator (G). To start a station Generator Boiler has to supply required steam for Steam turbine. Thus for starting the unit, the auxiliaries are supplied with power by station auxiliary transformer- which is powered from Grid. available ships, Airports, small and Large scale Industries.

III. CIRCUIT DIAGRAM

CIRCUIT DIAGRAM

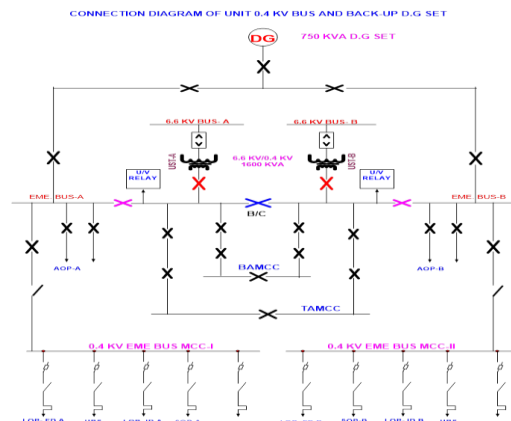


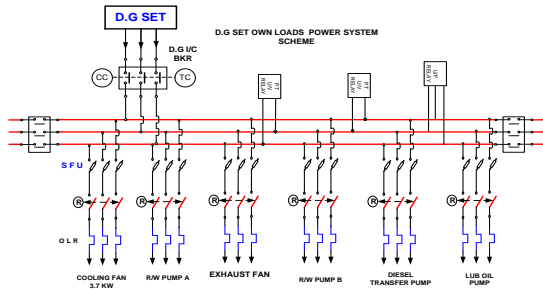
Functions Of Circuit Drives

- AMF PANNEL: To monitor & control the system
- DG SET: To give 0.4kv power supply to the emergency bus during fault condition.
- CRANK DRIVE: To give crank(initial motion) command to the DG set.
- DAY TANK: To give diesel to the diesel generator set.

Connection Diagram Of Unit 0.4kv Bus And Back-Up D.G Set

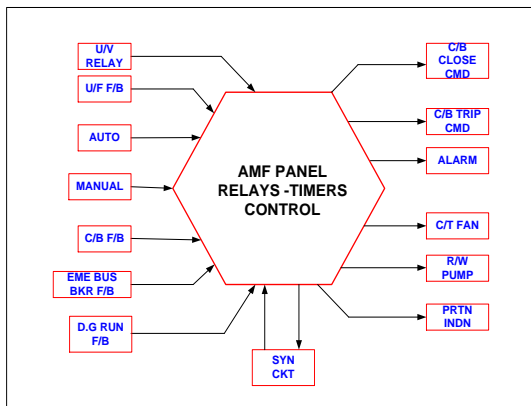
CONNECTION DIAGRAM OF UNIT 0.4 KV BUS AND BACK-UP D.G SET





IV. EXISTING SYSTEM

If emergency bus function under any error such as overloading problem first it will produce the alarm sound. Then the external diesel generator supplies 0.4KV power supply to the bus by using technique PLC

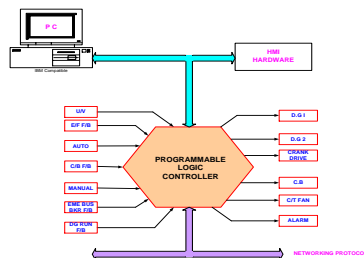


EXISTING CONTROL SCENARIO

Disadvantages

It is not much efficient on supplying the power supply. Wiring connection is complex. Automatic process of turn on the cooling system is failure.

V. PROPOSED SYSTEM

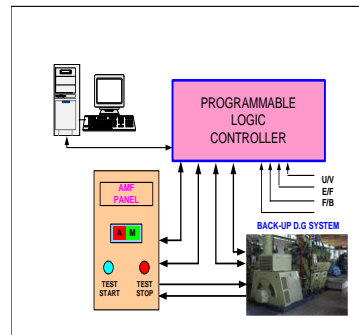


Our proposed system is to implement PLC design for the AMF system to do its service in a highly structured and

User-friendly approach. Auto Mains Failure system is one, which has a Diesel engine connected with an Alternator (0.4 KV). Upon normal power interruption, will start automatically to make up power requirements. Interruption may cause severe problems (in Main Generation), hence it has to be restored by some means as quick as possible. This task is being managed by AMF system effectively.

BASIC AMF SYSTEM:

BASIC



Advantages

We can avoid the damage due to over heating by providing proper lubrication. It will check rated voltage gives to the generator. It will automatically turn on the cooling system

VI. CONCLUSION

We did our project in stage-II unit 0.4 KV system monitoring and D.G set starting via PLC. We had idea about existing relays and timers based control for breaker and associated devices. We implement PLC for the above control, and we realize an enhancement in control via software. While implementing PLC, it is quite convenient to control the elements i.e. circuit breakers, motors. Due to the superior communication facility with PC, system monitoring via computer is possible. Control of elements via PC makes this technology to widespread use in process control engineering applications. PLC makes the system control with high reliability, relatively at faster speed of data transfer compared to other available technologies and consumes very less power for its operations.

Related software uses Ladder language for 0.4KV bus monitoring/D.G starting via AMF panel and associated D.G system drives cooling facilities made done via PLC. The output also verified through simulation. Thus we satisfactorily complete our project with PLC technology. We are very glad to thank one and all who help, encourage and guide towards a

valuable project. Our sincere thanks to the management of NLC for the ever remember moments of our carrier.

REFERENCES

- [1] JHON. WEEB, RONALD A.REIS-Programmable Logic Control, principle and applications
- [2] Ladder rules-notes for training institute.
- [3] Omran manual- introduction to PLC.
- [4] J.B.Gupta -theories and performance of electrical drives.