Simulation Based Direct Torque Control In Induction Motor

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Abstract :***This paper explains about speed control of 3 phase Induction motor by using Programmable Logic Controller (PLC) based drive system. There are various speed control techniques for the induction motor like, direct torque control, sensor less vector control and field-oriented control. Field oriented control method is most efficient method for controlling the speed and torque of induction motor. PLC based drive system is applied here for the speed control of 3 phase induction motor to achieve maximum torque with minimum loss. The simulation of PLC based control of induction motor is done with the help of SIMULATION. Comparison of result of PLC based drive system shows the superiority of PLC based drive system***

Index Terms - *TORQUE, PLC, HUMAN MACHINE INTERFACE, SIMATIC, POWER SUPPLY*

I. INTRODUCTION

Torque control is the most important parameter in the machine control. there are various method. Involved in controlling torque. Direct torque control (DTC) is one method used in variable-frequency drives to control the torque (and thus finally the speed) of three-phase AC electric motors. This involves calculating an estimate of the motor's magnetic flux and torque based on the measured voltage and current of the motor.Torque is estimated as a cross product of estimated stator flux linkage vector and measured motor current vector. the estimated flux magnitude and torque are then compared with their reference values. if either the estimated flux or torque deviates too far from the reference tolerance, the transistors of variable frequency drive are turned off and on in such a way that the flux and the torque errors will return in their tolerant bands as fast as possible. thus, direct torque control is one form of the hysteresis.A typical variable frequency drive (VFD) can have anywhere from a few hundred to well over a thousand parameters. Knowing which ones to adjust and to what setting can be intimidating. Which parameters are important and which ones not so much? Arguably, one of the most important, and sometimes misunderstood, VFD parameters is the one which determines the "Control Method". Setting a VFD for the correct control method can make or break an application. Once an understanding of the advantages, disadvantages, and particular specifications for each control method is established, choosing the right one for your application is simple.

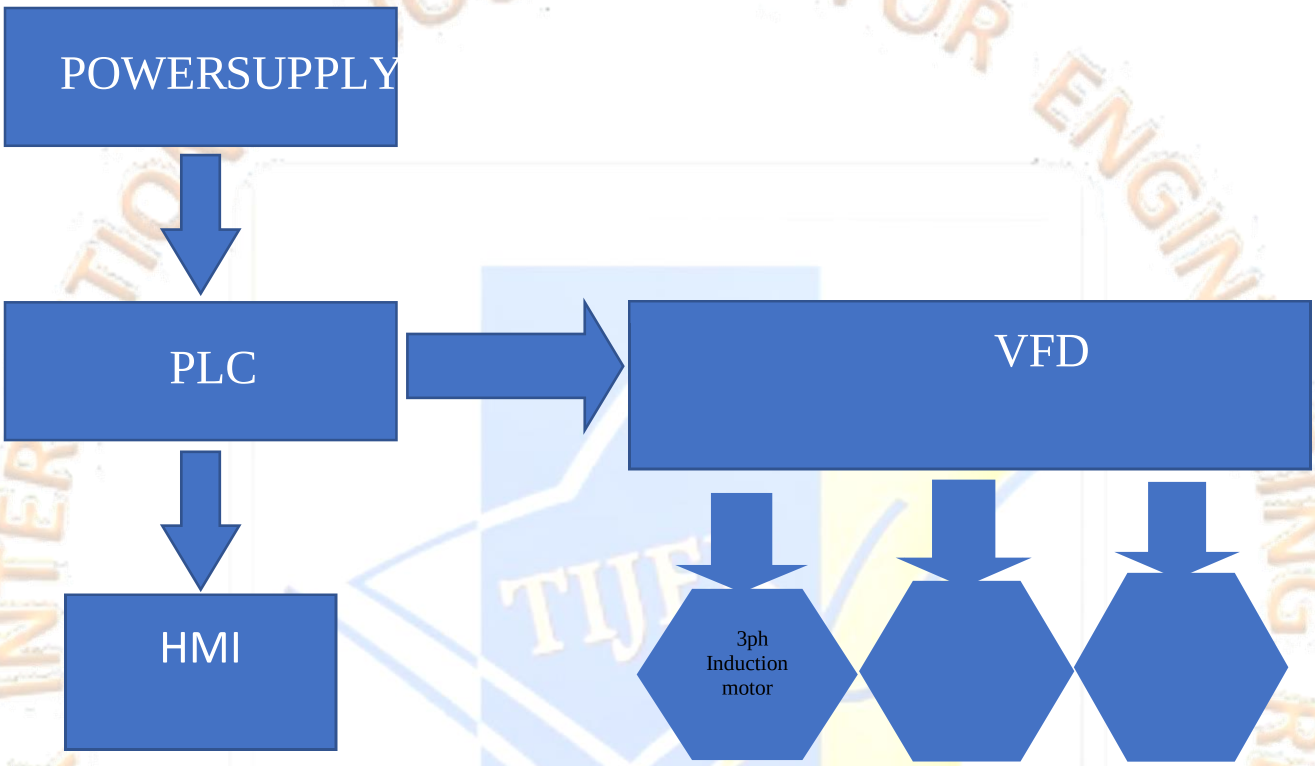
II. LITERATURE SURVEY

Primary function of a VFD in aquatic applications is to provide energy savings. By controlling speed of a pump rather than controlling flow through use of throttling valves, energy savings can be substantial. By way of example, a speed reduction of 20% can yield energy savings of 50%.

- Energy Savings.
- Reduces Peak Energy Demand.
- Reduces power when not required.
   Fully Adjustable Speed.
   Controlled starting, stopping, and acceleration.
- Dynamic Torque Control.
   Provides smooth motion for applications such as elevators and escalators.

There are several industrial processes including those of manufacturing, power generation, fabrication and refining that require an immediate and accurate temperature control and monitoring infrastructure. This paper concentrates upon the development of one such infrastructure, with fewer hardware details. The hardware requirement is minimized by using simpler firing angle generation hardware and data acquisition particulars. This design incorporates a temperature sensor installed in any industrial environment, a motherboard card for deciphering the temperature senor's FEEDBACK information and based on SETPOINT definition, issuing a timed firing pulse for actuating a TRIAC controlling the magnitude of HVAC provided to the particular industrial equipment. The SETPOINT is communicated to the motherboard via wireless channel, from the HMI. Once the coincidence between SETPOINT and FEEDBACK temperatures occur the equipment is made to operate in equilibrium. Both the SETPOINT and FEEDBACK temperatures are displayed on an LCD panel, for the convenience of operation and maintenance of the particular equipment.[4]this explained by HaiderAli,Ahmed Ali, RiazUlHassnain.

III. PROPOSED METHODOLOGY



IV. CONCLUSIONS

We are used the VFD to control the motor speed
VFD command is via through PLC
HMI used for the parameter setting and data input purpose

V. REFERENCES

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