OPEN CIRCUIT FAULT DETECTION IN Z-SOURCE INVERTER FED INDUCTION MOTOR

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Abstract. As of late acceptance engines assumes a crucial job in local and Mechanical territories contrasted with DC engines and simultaneous engines in numerous viewpoints like cost, size, productivity, life length and viability. In this paper we propose an open circuit issue can be distinguished through estimating the stage and line voltage of the inverter. It very well may be finished by supplanting an additional arm gave in the circuit the impact of the difficult will be distinguished. At that point the terminating edge from the processor is given to the additional arm. The substitution of switch will be managed ceaselessly the entire framework and recoveries the unknown time. Re-enactment results are given to exhibit the recognition and substitution. This test material to control the undesirable fault and used to fabricate a three stage impedance source inverter model.

1. Introduction

Inverter changes over the dc to air conditioning power. The inverters are to a great extent utilized in businesses to drive air conditioning engines. The flaws in the inverters are inadvertent conduction way (short out or blockage of current (open circuit). At the point when any of the shortcoming happens, it is required to stop the entire framework for a vague time. The expense to supplant the framework flaw will be high. So it is required to limit the expense by supplanting the flaws. The different deficiencies happens in the inverter can be recognized utilizing the comparator. The substitution should be possible through the investigation of the framework and a few adjustments should be possible to the framework to correct the issue.

In this paper we talk about the open switch issue and substitution of the blamed switch. At the point when this shortcoming is happens the stage and line voltages of the inverters get diminished. This will prompt decrease of Force and speed of the engine. This voltage might be Adequate to drive the engine. This deficiency happens when the door voltage isn't exchanged. Estimating stage and line voltages of the framework to distinguish the open circuit deficiency.

Prior the current chooses the discovery of different shortcomings. R.L.Araujo Ribeiro [1] gives the different discovery methods to distinguish the open switch shortcoming. Rene Spee [2] talks about the different issues and the sound drive of the engine when the issues are happened with the some medicinal activities. Raphael Peuget [3] distinguishes the issues by information based guidelines. F.Blaabjerg, Tooth Zhang peng and S.S. Darly [4-6] gives the discovery of flaws like short out of two yield stages, hamper dc connection and ground or earth issue. In this paper we give the substitution of this shortcoming through an additional arm put in this circuit.

This paper presents the deficiency discovery and distinguishing proof of open switch utilizing the inverter shaft voltage estimation method, which quantifies the voltages at different places and looking at the voltages. The location and recognizable proof of open switch should be possible in exceptionally lesser time. To present such procedures in engine drive frameworks as useful elements, equipment and programming must play out the accompanying assignments: shortcoming discovery, issue ID, and medicinal activities.

2. DEVELOPMENT OF PROPOSED MODEL

In this undertaking we are going to discover the location and substitution of open circuit flaw, the force gracefully is given to the diode connect rectifier, the diode connect rectifier deals with the standard of changing over from air conditioning flexibly to DC flexibly and The Z-source converter utilizes a one of a kind impedance system (or circuit) to couple the converter fundamental circuit to the force source, in this manner giving one of a kind highlights that can't be acquired in the conventional voltage-source (or voltage-took care of) and ebb and flow source (or ebb and flow took care of) converters and the beat generator creates the beat and given to the four leg inverter to drive the enlistment engine through driver unit.
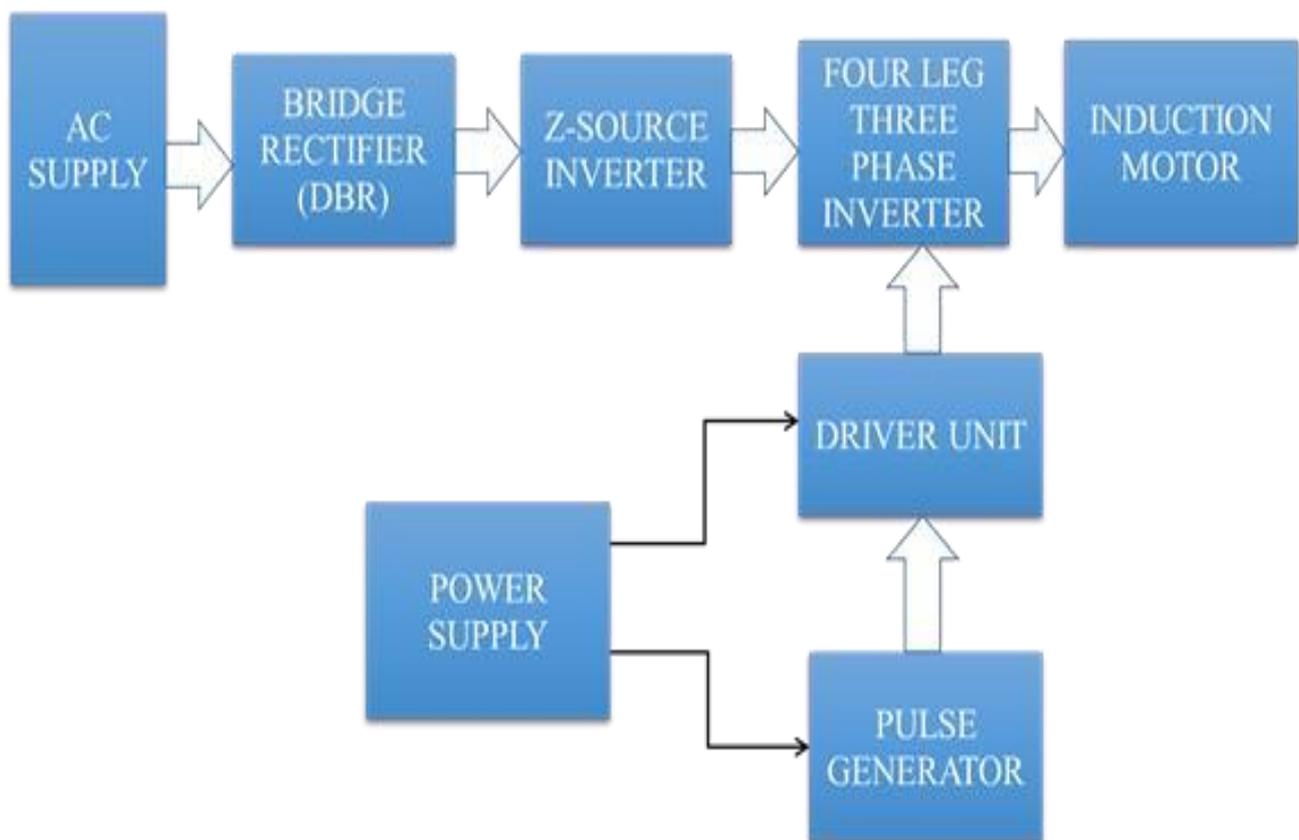

Fig.1 Development of proposed model

3. FAULT DETECTION TECHNIQUES

This paper presents the issue recognition and recognizable proof of open switch utilizing the inverter shaft voltage estimation strategy, which gauges the voltages at different places and contrasting the voltages. The discovery and distinguishing proof of open switch should be possible in lesser time. To present such procedures in engine drive frameworks as functional elements, equipment and programming must play out the accompanying assignments: shortcoming recognition, flaw recognizable proof, and therapeutic activities.

An essential necessity to all blame lenient advancement is a complete comprehension of the normal framework activity with the goal that its conduct can be contrasted with that one at the beginning shortcomings. The various sorts of issues regularly checked in the exchanging power stage are shown as F1… .. F6. Contingent upon the idea of the shortcoming, conclusion or opening of switches, which can be named: • Dc interface short out to ground (F1)

- Dc interface short out to ground (F1)
- Dc interface capacitor bank hamper
- Open circuit harm of switch (F3)
- Short circuit harm of switches (F4)
- Line to line cut off machine terminal (F5)
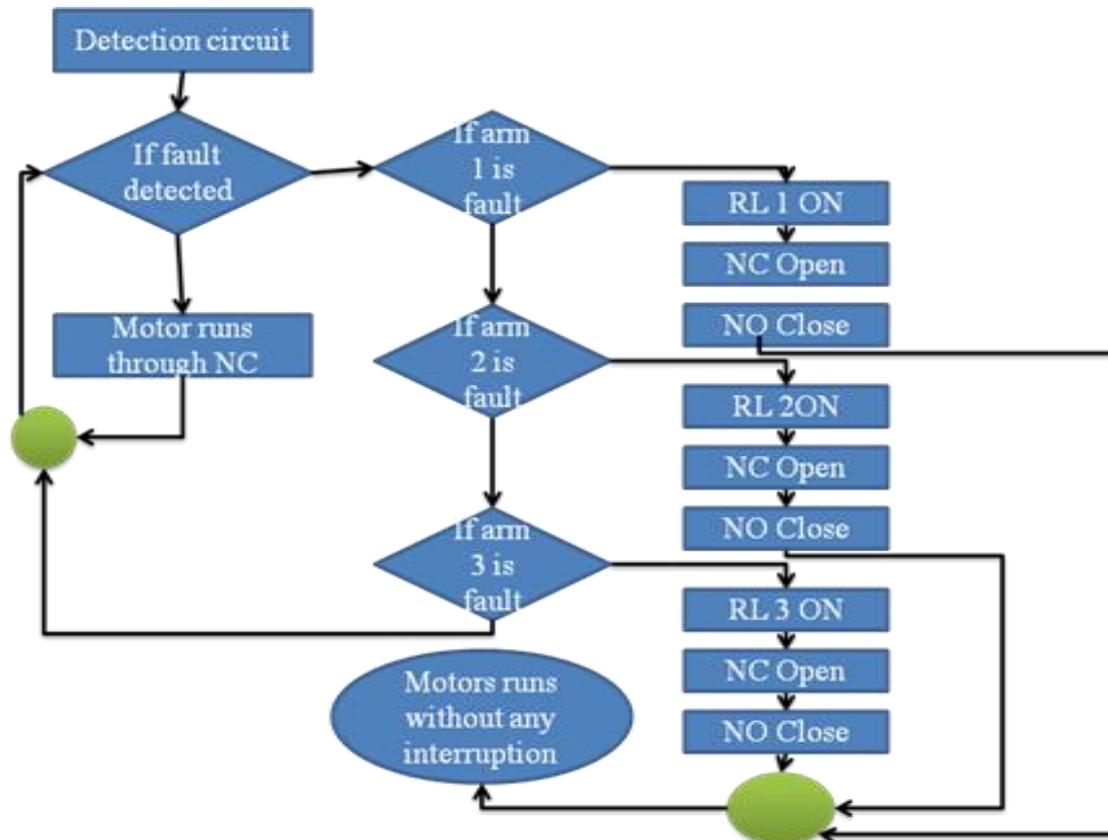- Single line to ground issue at the machine terminal (F6)

Fig. 2 Operation Flow chart

The assurance plan of the drive framework is typically intended to forestall the harm of the exchanging power converter. Such a plan incorporates the hardware to forestall over voltage and under voltage of the dc connect transport just as the over current of the inverter. Breaker transfers secure the information side against over flow and warm ones ensure the electrical machine against overheating. An electrical switch intrudes on flows on account of over-burden in the frameworks. Be that as it may, the defensive circuit won't amend or recognize the open switch harm in the inverter. So the open switch harm shortcoming is chosen. The different recognition strategies are utilized to identify the shortcoming event.

The location procedures utilize an immediate correlation of the deliberate voltages to their reference voltages got from the reference signals. They are delegated follows. Method 1 – Inverter shaft voltage estimation

Method 2 – Machine phase voltage estimation

Method 3 – Framework line voltage estimation Procedure 4 – Machine nonpartisan voltage estimation

In these cases, the voltage mistake ϵ_{ij} (I, j =1, 2… 6) are the factors utilized for both the discovery and recognizable proof of the broken switch of intensity inverter. Such mistake can be communicated as $\epsilon_{ij} = v^*_{ij} - v_{ij}$

The shortcoming determination for strategies T1 to T4 is cultivated in three stages as follows.

 Measurement of voltages (vij)
 Generation of the voltage mistake (Єij)
 Determination of the broken condition and recognizable proof of flawed condition

Strategy 1 uses the examination of voltages between the reference voltage and inverter shaft voltage. This procedure is quicker than different strategies. The time required to distinguish and recognize the open switch deficiency is littler than different methods. Method 2 uses the correlation of voltages between the reference voltage and machine stage voltage. Strategy 3 uses the correlation of voltages between the reference voltage and framework line voltage. Procedure 4 uses the examination of voltages between the reference voltage and machine impartial voltage. This method will recognize the broken condition when it is joined with different strategies.
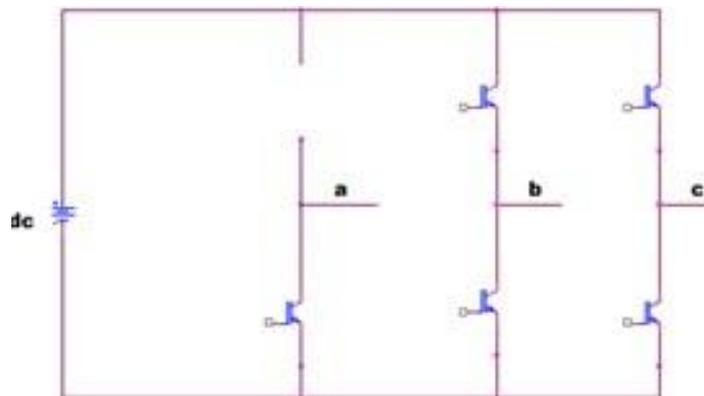
Fig. 3 Proportional circuit when open circuit deficiency happened.

4. RESULT AND DISCUSSION

Prior the defective condition is recognized by the current estimation. The ID of issue is impossible utilizing current estimation which was utilized before. It will take one crucial cycle to identify the issue.

Presently the location and distinguishing proof of flawed condition is finished by voltage examination strategy. The previously mentioned issues will be corrected by utilizing voltage estimation. The location of flaw is speedier than the current estimation. Strategy 1 is chosen for the discovery and recognizable proof of open switch deficiency since this procedure has the above said favorable circumstances and takes lesser time than different strategies. Procedure 1 is utilized to distinguish and recognize the open switch
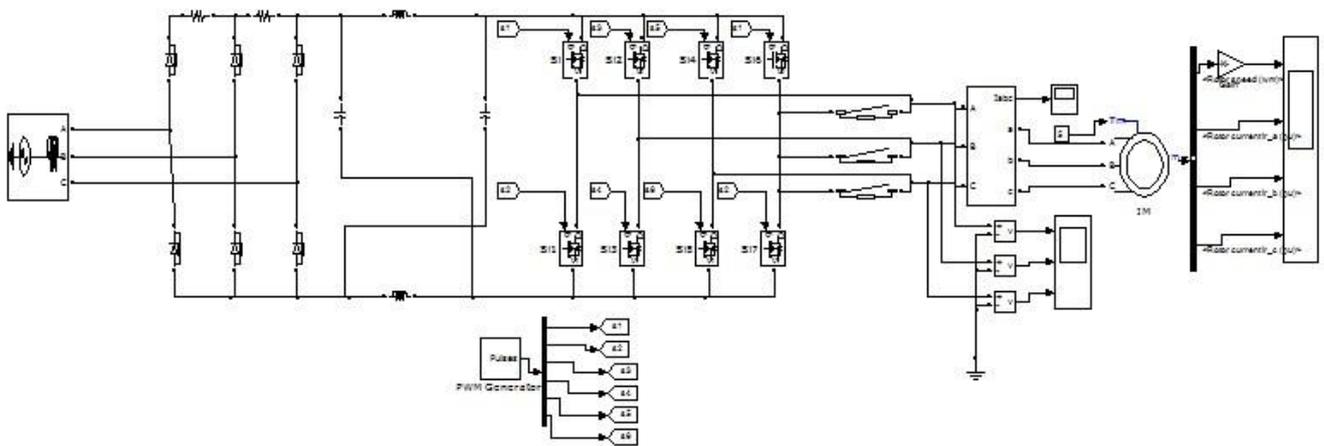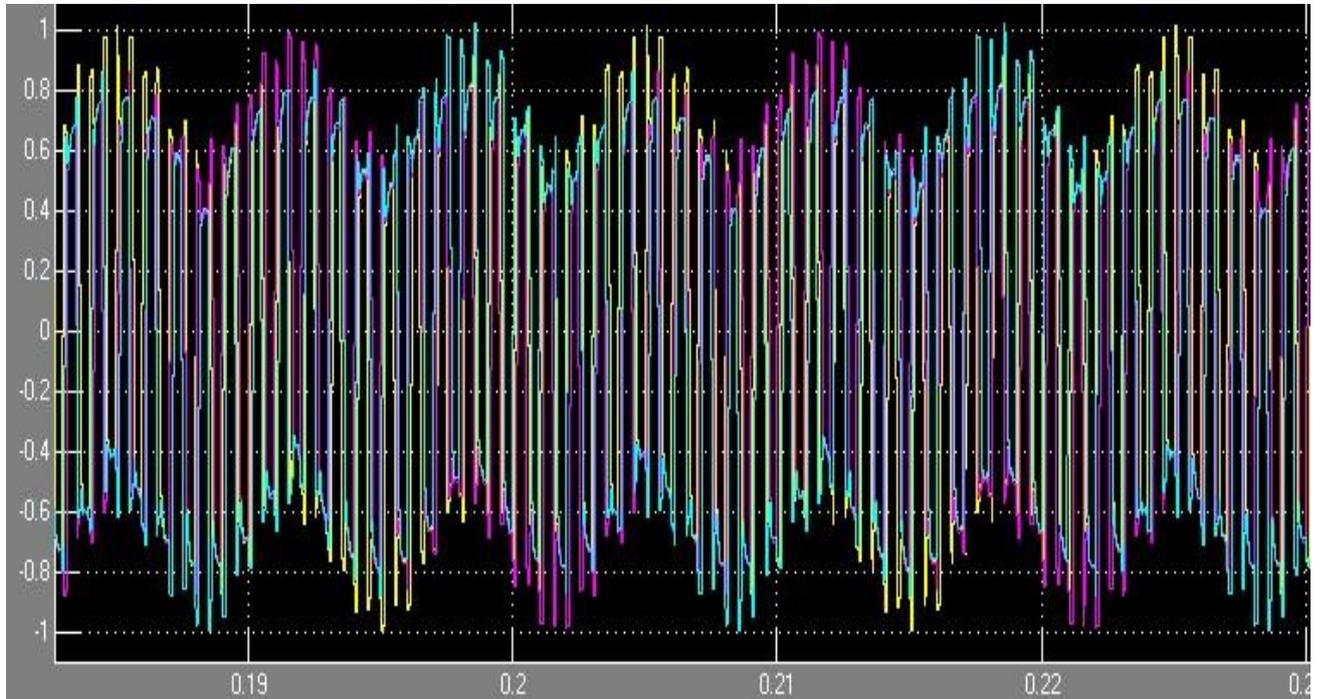
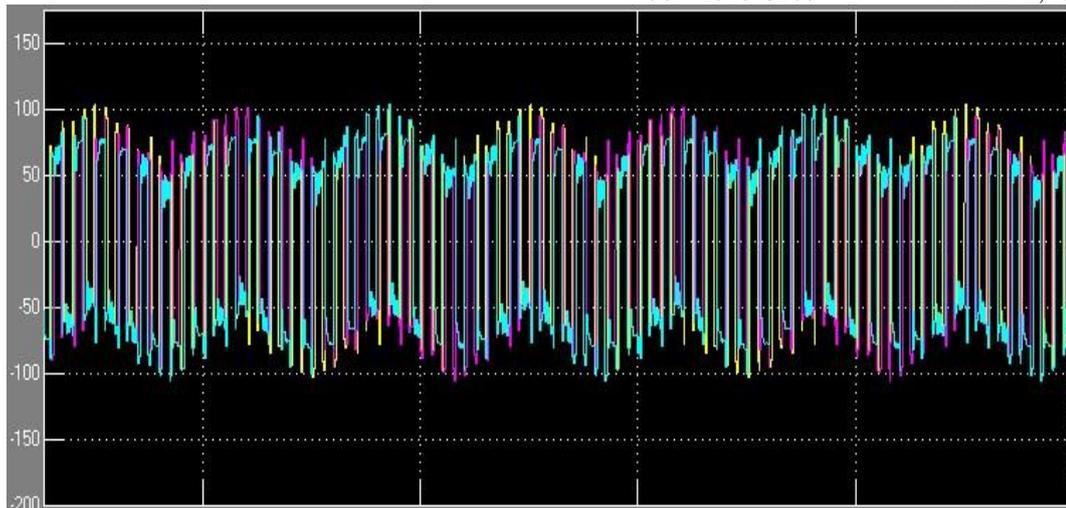shortcomings

Fig. 4 Fault occurred in arm 1

Fig.5 without fault voltage and current waveform. The preview of the equipment circuit with their heap for the discovery of open circuit flaw in Z-source inverter took care of acceptance engine
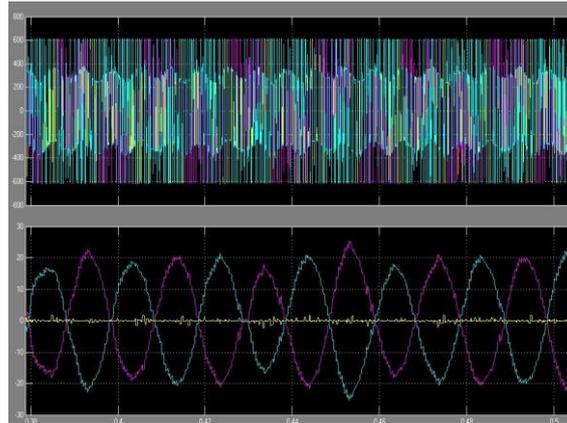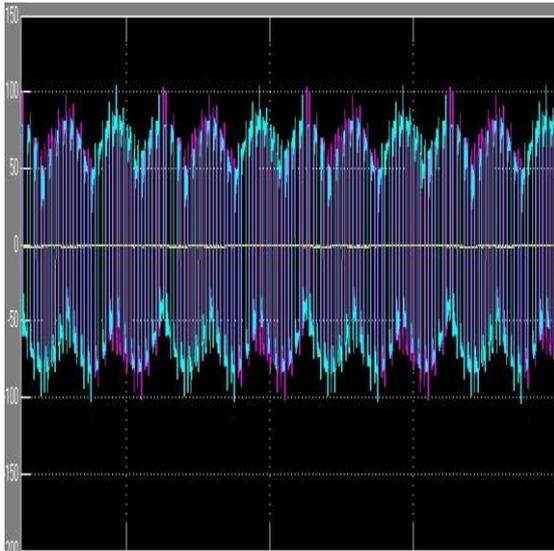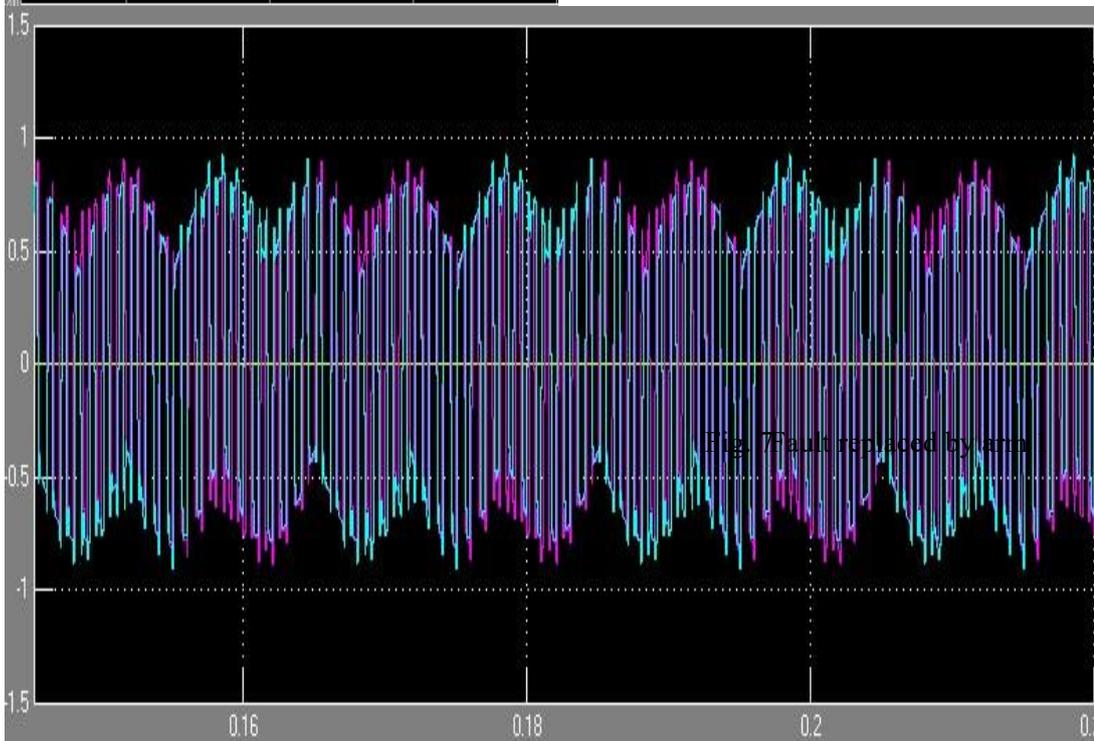
Fig 7 Fault occurred in arm 1

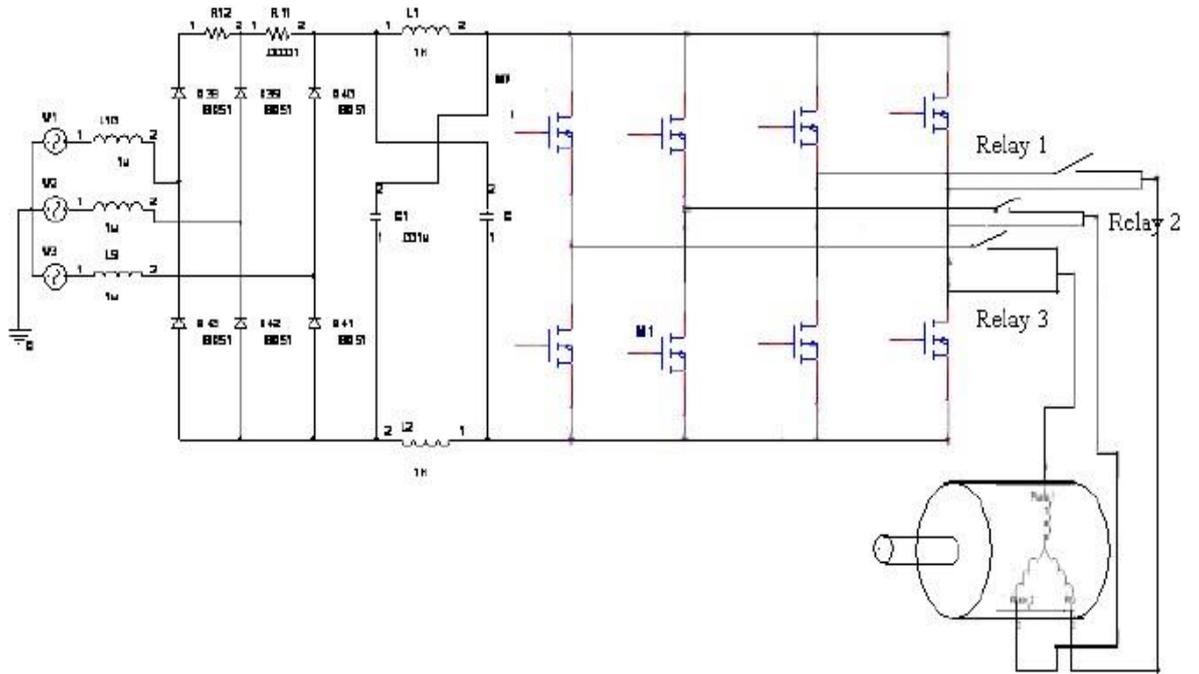Fig. 6Fault occurred in R phase voltage and current waveform

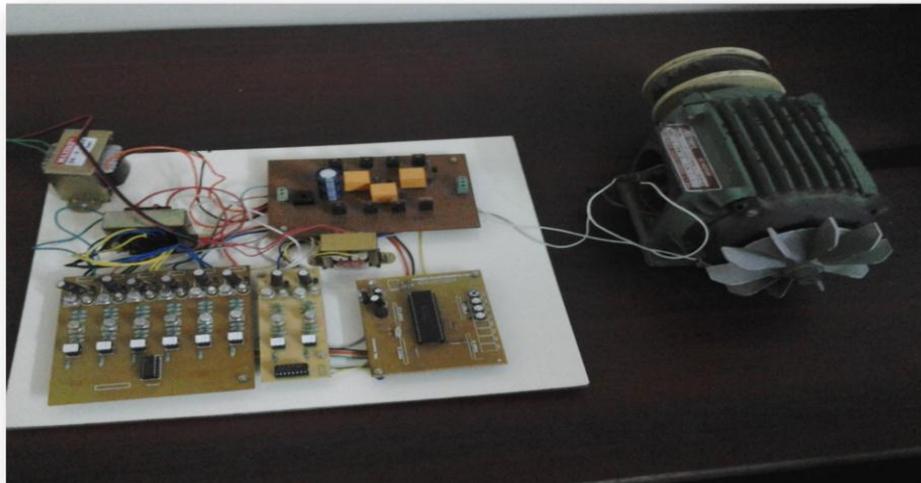Fig. 8 open circuit fault in z source inverter fed induction motor

Fig. 9 Circuit Diagram of the Hardware Setup

5. CONCLUSION

The identification and substitution of the switches talked about in this paper is finished by estimating the line and stage voltages of inverter and contrasting it and the reference voltages which is utilized to intrude on the processor to give the gating beats of broken change to the additional arm. This additional arm is associated with the heap physically. This undertaking can additionally improve by making the manual changing of changes to a customized one.

6. REFERENCES

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