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Application Method Certainty Factor in Electrical Damage

Akhmad Zulkifli [1], Meisarah Riandini [2], B. Herawan Hayadi [3], Elyandri Prasiwiningrum [4]
Universitas Hangtuah Pekanbaru, Riau, Indonesia[1]
Universitas Potensi Utama, Medan, Indonesia[2,3]
Universitas Rokania, Riau, Indonesia[4]
email : zulkifli.akhmad@gmail.com [1], meisarah.riandini22@gmail.com [2], b.herawan.hayadi@gmail.com [3]
eprasiwiningrum@gmail.com [4]

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ABSTRACT

Electricity is need main For life people human . Electricity is used man For various type activity human . Electricity plays a big role for life , like For lighting , cooking , and so on . Almost all activity daily use electricity . Almost every home in Indonesia, both in the city nor village Already trellis with electricity . For stream and distribute electricity to each home , office nor distant institutions _ away , then needed Transformer Distribution . Transformer Distribution This own objective use special that is, to lower voltage tall to voltage low , so that the voltage used in accordance with equipment ratings electricity customer or load in general . For help in handle problem damage Transformer distribution , then one is needed branch from Knowledge computer that is System Expert . System Expert is system based computer that uses knowledge , facts , and techniques reasoning in solve problem , which usually is only can completed by one expert in field certain . (Putri, 2020). The method used in research _ This is *Certainty Factor*. Study This apply *certainty factor* method For role in diagnose damage to electricity . Based on results discussion on with choose one _ damage namely P1 (Oil transformer go out from the transformer body) on the study case obtained decision level accuracy that is as big That's 5.650198%. means system expert certainty factor method can overcome damage and deliver results diagnosis good at damage electricity.

Corresponding Author:

Ahmad Zulkifli
Universitas Hang Tuah Pekanbaru
Email: zulkifli.akhmad@gmail.com

1. INTRODUCTION

Electricity is need main For life people human . Electricity is used man For various type activity human . Electricity plays a big role for life , like For lighting , cooking , and so on . Almost all activity daily use electricity . Almost every home in Indonesia, both in the city nor village Already trellis with electricity . For stream and distribute electricity to each home , office nor distant institutions _ away , then needed Transformer Distribution . Transformer Distribution This own objective use special that is For lower voltage tall to voltage low , so that the voltage used in accordance with equipment ratings electricity customer or load in general . For help in handle problem damage Transformer distribution , then one is needed branch from Knowledge computer that is System Expert . System Expert is system based computer that uses knowledge , facts , and techniques reasoning in solve problem , which usually is only can completed by one expert in field

certain . The method used in research _ This is *Certainty Factor.* Study This apply *certainty factor* method For role in diagnose damage to electricity

2.1 System Expert

kindly general , system expert *(expert systems)* is trying system _ adopt knowledge man to computer , computer order can finish problem as usual _ done by experts . System good expert _ designed to be finish something problem certain with copy Work from experts . _ With system expert this , ordinary people can finish enough trouble _ really complicated _ only can resolved with expert assistance . _ For experts , system _ expert this too will help activity as very experienced assistant .

System expert is System expert is A activity For move expertise / expertise somebody through A system . And p specific to the experts _ or expert in solve problem specified _ _ in A application .

System expert or regular Expert System also called the Knowledge Based System that is something intended computer application For help taking decision or solving problem in specific field . _ System This Work with use knowledge and methods analysis that has been defined especially first by an appropriate expert with field his expertise . System This called system expert Because function and role The same like a a must expert own knowledge , experience in solve something problem . System usually function as key important that will help something system supporters decision or system supporters executive .

2.2 Certainty Factor Method

Certainty Factor is method from merger trust and distrust in single number . _ In *certainty theory* , qualitative data presented as degrees belief *(degree of belief).* There are two step in representation of qualitative data . First step is ability For express degrees belief the in system expert . In express degrees certainty , *certainty factor* For assume degrees certainty a expert to a data. *Certanity factor* introduce draft *belief/* belief and *disbelief* / unbelief .

Draft This Then formulated in formula base as as follows : CF[H,E] = MB[H,E] – MD[H,E]…….. (1)

CF[H,E]1 = CF[H] * CF[E] …….. (2)

Description :

CF = Certainty factor (factor certainty) in hypothesis H which is influenced by the fact E.

MB = Measure of belief (level belief) is size in trust hypothesis H is influenced by the facts H.

E = *Evidence* (events or facts)

CF(E) = Certainty factor evidence E which is influenced by *evidence e*

CF(H) = Certainty factor hypothesis with assumptions evidence is known with sure , ie when *CF(E, e) = 1*

CF(H,E) = Certainty factor hypothesis influenced by evidence *e*

If all the evidence on the antecedent is known with sure .

Certainty factor For similar rules (Similiary concluded rules)

*CFcombine CF[H,E]1,2 = CF[H,E]1 + CF[H,E]2 *(1-CF[H,E]1)…… (3) CFcombine CF[H,E]old3= CF[H,E]old + CF[H,E]3 * (1-CF[H,E]old)…….(4*

2. RESEARCH METHOD

Method used _ in framework Work study This is method *waterfalls.* method *waterfall* is a development model system systematic and sequential information . _ Researcher use method this *waterfall* Because application No too hard . As for the *waterfall* model used _ as following :

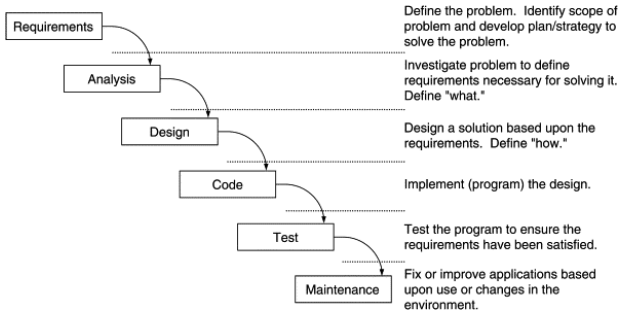

Figure 3.1 Methodology Study with the Waterfall Model

3. RESULTS AND DISCUSSION

Table 4.1 Damage List

No	Crash Code	Damage name
1	P1	Oil transformer go out from the transformer body
2	P2	*Over Load* / Over Load
3	P3	Primary *bushing* ejects oil
4	P4	Jamper wire copper short transformer
5	P5	Transformer *over balance* / No load balanced
6	P6	secondary /primary bushing is broken

Table 4.2 Symptoms damage

No	Symptom damage
1	Bolt *body* transformer saggy
2	Over load capacity transformer
3	Bolt *loose* primary bushing
4	Wire *bushings* transformer separated
5	Burden no balanced too Far
6	Snatched lightning / Factor weather

Table 4.3 Damage Name and Symptoms Damage

No	Damage name	Symptom Damage
1.	Oil transformer go out from the transformer body	1
2.	Over load	2
3.	Primary bushings emit oil	3
4.	Jamper wire copper short transformer	4
5.	Overbalanced transformer	2
6.	secondary /primary bushing is broken	6

Table 4.4 Action-Condition

Code	**Rule**
P1	*IF* Bolt rack transformer slack is True AND Load is exceeded Capacity Transformer is True AND Loose primary bushing bolt is True *THEN* Oil transformer go out from the transformer body
P2	IF Load exceeds capacity Transformer is True AND Load is not balanced too remote is True THEN Over Load
P3	IF Loose primary bushing bolt is True THEN Primary bushing ejects oil
P4	IF Transformer bushing wire breaking up is True THEN Jamperan wire copper short transformer
P5	IF load exceed capacity Transformer is True AND Load is not balanced too far is True THEN Over balance transformer
P6	IF Snatched lightning / factor weather is True THEN The secondary /primary bushing is broken

a. Studies Case with with choice P1

Example case Calculation of P1 (Oil transformer go out from the transformer body)

CFCombine CF[H,E]1, 2 = CF[H,E]1 + CF[H,E] 2 * (1 - CF[H,E]1)
= 0.54 + 0.56 * (1- 0.54)
= 0.54 + (0.2576)

CFold 1 = 0.7976

CFCombine CF[H, E]1, 3 = CF[H, E]1 + CF[H, E]3 * (1 - CF[H, E] Old1)
= 0.7976 + 0.35 * (1 – 0.7976)
= 0.7976 * (0.07084)

CFold 2 = 0.056502

With thereby results percentage = 0.056502* 100%
= 5.650198 %

4. CONCLUSION

Based on results discussion on with choose one _ damage namely P1 (Oil transformer go out from the transformer body) on the study case obtained decision level accuracy that is as big That's 5.650198%. means system expert certainty factor method can overcome damage and deliver results diagnosis good at damage electricity

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