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Reliability Evaluation of Composite System with Aging Failuire

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Abstract

Reliability is concerned with the system capability of survival. In the past forty years, customer expectations have been increasing in response to evolving new technologies. As part of these evolutions, they are demanding from their suppliers: products with higher quality, low initial cost, improved customer support and products that are easy and inexpensive to maintain. For a supplier to survive, succeed and be profitable in today's market, It must do the following: a) Constant improvement in the quality of the products. b) Minimization of the cost. c) Be flexible and responsive to the customer's requirement.This deals with reliability evaluation of combined generation and transmission system known as composite system. It describes a technique calculate composite system reliability with aging failure.

Index terms— Power System Reliability, Transmission, Generation

1 Introduction

eliability is concerned with the system capability of survival. In the past twenty years, customer expectations have been increasing in response to evolving new technologies. As part of these evolution, they are demanding from their suppliers: a) Constant improvement in the quality of the products. b) Minimization of the cost. c) Be flexible and responsive to the customers' requirement.

Previously the criteria and techniques used for reliability assessment were all deterministically based. The essential weakness was that they did not account for the probabilistic or stochastic nature of system behaviour and component failures. However, the Author : Assistant Professor, EEE, SETGOI, Durgapur, West Bengal. E-mail : tana_lakshman@yahoo.co.in probability theory alone cannot predict either the reliability or safety of the equipment. It is only a tool available to the engineer in order to transform his knowledge of the system for the prediction of future behaviour of the system.

2 II.

3 Objectives

So basic Objective is to calculate EENS value of loads connected to the system with Skm's PTW 6.5 .

4 III.

5 Methods

The RBTS is a 6 bus system composed of two generator buses, 5 load buses, 9 transmission lines and 11 generating units. The total installed capacity is 240 MW and the system peak load is 185 MW. ear 2012 Y Products with higher quality, low initial cost, improved customer support and products those are easy and inexpensive to maintain. For a supplier to survive, succeed and be profitable in today's market, it must do the following: a) Rbts Data Table **??** : Bus Data for RBTS system b) Generation Data Table **??** : Generator data for RBTS system c) Rbts-Transmission Data

The relevant reliability data for the nine 110 kV lines in Fig. 1 in terms of the permanent and transient failure rates and the permanent outage repair times are given in **??**11]. The outage duration of a transient outage is considered to be less than one minute. Outages of substation components which are not switched as a part of a line are not included in the line data. A nonrepairable chance failure refers to a random basin curve. Obviously, it corresponds to a constant failure rate and therefore can be modeled using an exponential distribution. fatal failure in the normal operating stage of the life. A nonrepairable wear out failure refers to a random fatal failure in the normal operating stage of the life basin curve. Obviously, it corresponds to a increasing failure rate and therefore can be modeled using an exponential distribution. ? ? ?)))) 1 t ? (? ? Time(hr) ? =0.5 ? =1.0 ? =1.

6 Results & Discussion

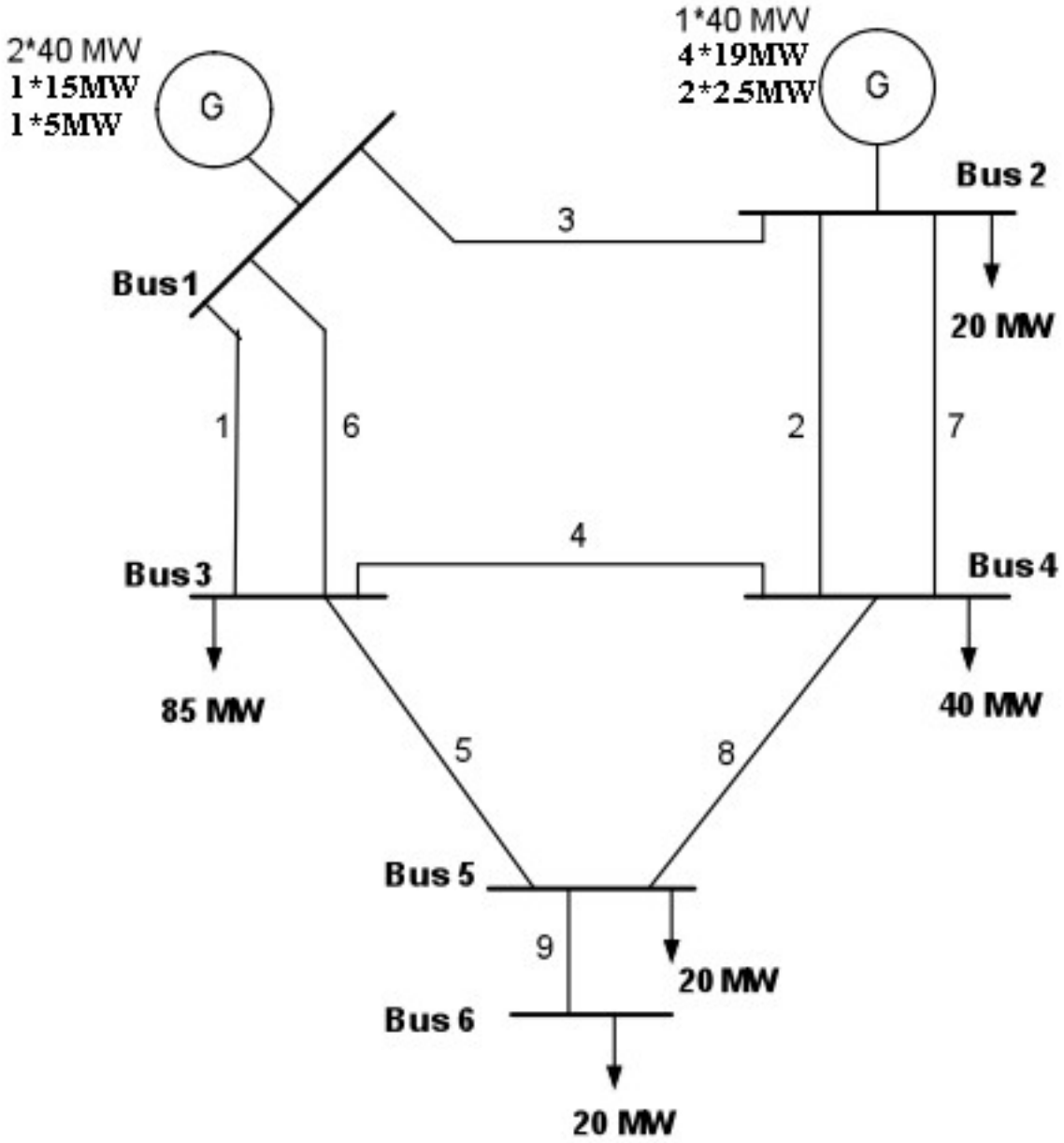
From the Reliabilty analysis we get the life basin curve by plotting EENS value with time for ? =0.5, ? =1.0, ? =1.5.

7 V.

Discussion And Conclusions to calculate reliability of composite system by calculating probability and frequency of failure of system under different conditions. This area of composite power system reliability evaluation is least developed and also one of the most complicated but in view of environmental, ecological, societal and economic constraints faced by most of power utilities, this area is developing and getting attention in international market.

1

Figure 1: Figure 1 :



25

Figure 2: Figure 2 : 5 A

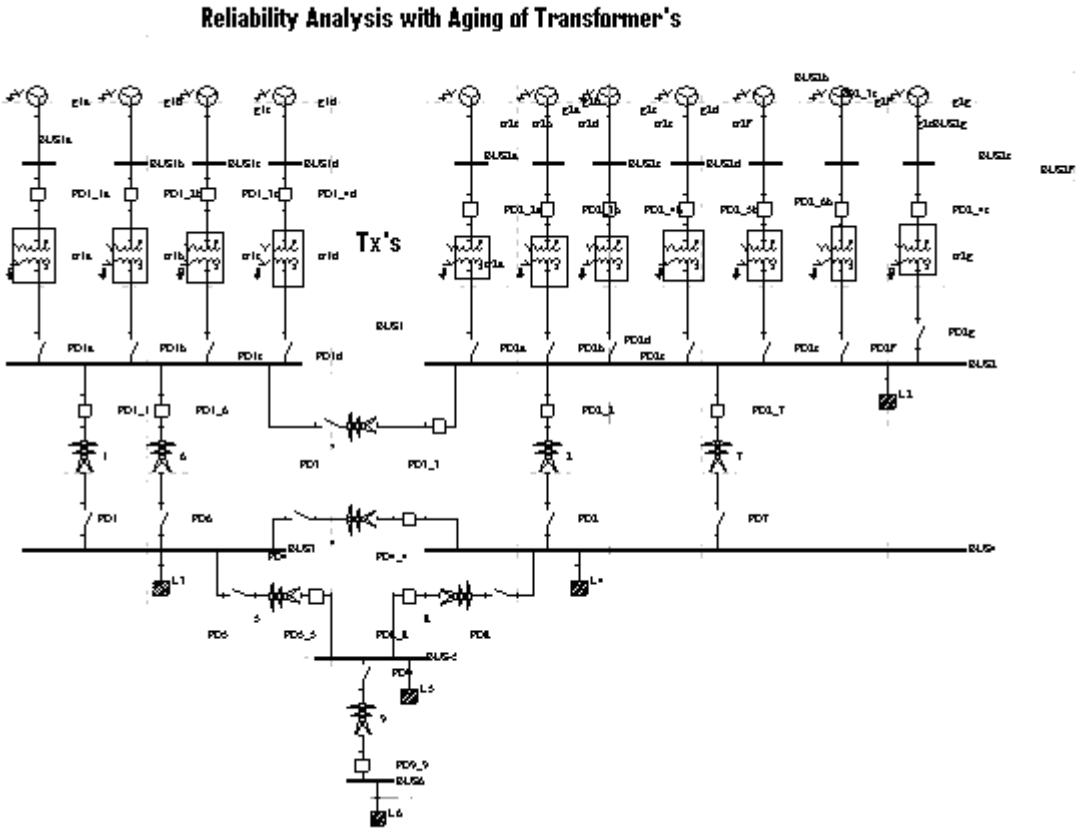


Figure 3:

3

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Figure 4: Table 3 :

4

Figure 5: Table 4 :

5

: Load Reliability Data

Figure 6: Table 5

6

e) Aging Repair Rate The Value of	is calculated from the following	Repair Rate Calculation Formula =
formula: = 1000000/(Failure Rate*EXP(GAMMALN(1+1/Shape Parameter		Where = Scale parameter = Shape parameter

Figure 7: Table 6 :

7

5

Figure 8: Table 7 :

8

=0.5

Figure 9: Table 8 :

9

?

?

Time(hr)	Reliability Analysis EENS(Kwh/year) Value for				
	L2	L3	L4	L5	L6
0	8855688.94	820.60	2065266.86	81867494.39	95477314.39
1	8855688.94	820.60	2065266.86	81867494.39	95477314.39
5	8855688.94	820.60	2065266.86	81867494.39	95477314.39
10	8855688.94	820.60	2065266.86	81867494.39	95477314.39
15	8855688.94	820.60	2065266.86	81867494.39	95477314.39
20	8855688.94	820.60	2065266.86	81867494.39	95477314.39
25	8855688.94	820.60	2065266.86	81867494.39	95477314.39
30	8855688.94	820.60	2065266.86	81867494.39	95477314.39
35	8855688.94	820.60	2065266.86	81867494.39	95477314.39
40	8855688.94	820.60	2065266.86	81867494.39	95477314.39

Figure 10: Table 9 :

10

=1.5

Figure 11: Table 10 :

[Adequacy Assessment Of Composite Generation And Transmission Systems Incorporating Wind Energy Conversion Systems ()] *Adequacy Assessment Of Composite Generation And Transmission Systems Incorporating Wind Energy Conversion Systems*, 2010. Yi Gao-University Of Saskatchewan

[Mehta et al. (2009)] *Application of Reliability Analysis In Expansion Of Transmission System*, A K Mehta , Dipak Ray , Kesab Bhattacharya . May, 2009. Academy Publisher. 1.

[Mehta et al. (2009)] *Application of Reliability Analysis In Expansion Of Transmission System*, A K Mehta , Dipak Ray , Kesab Bhattacharya . May, 2009. Academy Publisher. 1.

[Bulk System Reliability Evaluation In A Deregulated Power Industry-Yifeng Li ()] *Bulk System Reliability Evaluation In A Deregulated Power Industry-Yifeng Li*, 2003. University Of Saskatchewan

[Development of Test System for Distribution System Reliability Analysis, Integration of Electric Vehicl into the Distribution Sys *Development of Test System for Distribution System Reliability Analysis, Integration of Electric Vehicl into the Distribution System-Pramod Bangalore*, 2011. Sweden. Chalmers University Of Technology Goteborg

[Incorporating Station Related Maintenance And Aging Outages In Composite System Reliability Evaluation-Hua Yang ()] *Incorporating Station Related Maintenance And Aging Outages In Composite System Reliability Evaluation-Hua Yang*, 2005. University Of Saskatchewan

[Incorporating Substation And Switching Station Related Outages In Composite System Reliability Evaluation-Rajesh ()] *Incorporating Substation And Switching Station Related Outages In Composite System Reliability Evaluation-Rajesh*, 2003. U Nighot-University Of Saskatchewan

[Maintenance Management In Power Systems-Matti Lehtonen (2007)] *Maintenance Management In Power Systems-Matti Lehtonen*, July 2007. Helsinki Univeristy Of Technology (Kungliga Tekniska Hogs kolan)

[Optimization And Implementation Of Maintenance Schedules Of Power-Yang Fan ()] *Optimization And Implementation Of Maintenance Schedules Of Power-Yang Fan*, 2011. National University Of Singapore

[Power System Reliabilityassessment Using The Weibull-Markov Model-Jasper Van Casteren ()] *Power System Reliabilityassessment Using The Weibull-Markov Model-Jasper Van Casteren*, 2001. Chalmers University Of Technology

[Reliability Analysis And Economic Equipment Replacement Appraisal For Substation And Sub] *Reliability Analysis And Economic Equipment Replacement Appraisal For Substation And Sub*,

[Reliability Assessment of Complex Power Systems and the Use of NEPLAN Tool-Shima Mousavi Gargari-Royal Institute of Tech *Reliability Assessment of Complex Power Systems and the Use of NEPLAN Tool-Shima Mousavi Gargari-Royal Institute of Technology, KTH*, 2006.

[Test Systems For Reliability And Adequacy Assessment Of Electric Power Systems-Roy Billinton ()] *Test Systems For Reliability And Adequacy Assessment Of Electric Power Systems-Roy Billinton*, 2010. Dange Huang. University Of Saskatchewan

[Verification Of The Transmission System Model Rbts Using Monte Carlo Simulation Methods-KTH, The Royal Institute Of Tech 'Verification Of The Transmission System Model Rbts Using Monte Carlo Simulation Methods-KTH, The Royal Institute Of Technology'. *School Of Electrical Engineering* 2008.