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Beta

Visual Basic

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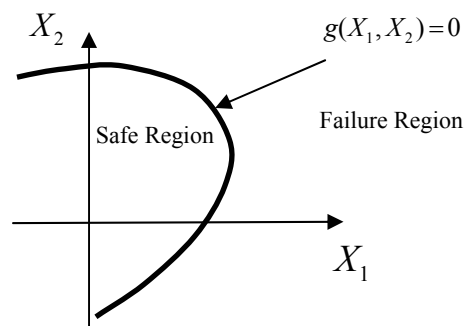
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$N ()$

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	Random Variables																																																	
	Normal Ice thickness					Maximum Ice thickness					Normal wind speed					Maximum wind speed																																		
	Mean	S.D	E.L	Nominal	Bias Factor	Mean	S.D	E.L	Nominal	Bias Factor	Mean	S.D	E.L	Nominal	Bias Factor	Mean	S.D	E.L	Nominal	Bias Factor																														
()	8.35	6.22	0.20	12.66	0.66	13.13	7.88	0.20	19.66	0.67	20.67	5.23	0.10	22.05	0.69	22.61	5.34	0.10	30.55	0.74	20.67	5.00	0.10	27.27	0.76	28.61	4.18	0.10	34.98	0.82	20.12	6.76	0.10	29.00	0.69	32.63	6.80	0.10	42.71	0.76	17.40	5.38	0.10	24.58	0.71	26.00	6.84	0.10	36.17	0.72
()	5.43	2.24	0.20	7.27	0.75	7.66	1.85	0.20	9.18	0.83	7.66	1.85	0.20	9.18	0.83	32.63	6.80	0.10	42.71	0.76	7.66	1.85	0.20	9.18	0.83	7.66	1.85	0.20	9.18	0.83	32.63	6.80	0.10	42.71	0.76	7.66	1.85	0.20	9.18	0.83	32.63	6.80	0.10	42.71	0.76					
()	6.96	3.26	0.20	9.64	0.72	9.92	3.31	0.20	12.64	0.78	9.92	3.31	0.20	12.64	0.78	28.61	4.18	0.10	34.98	0.82	9.92	3.31	0.20	12.64	0.78	9.92	3.31	0.20	12.64	0.78	28.61	4.18	0.10	34.98	0.82	9.92	3.31	0.20	12.64	0.78	9.92	3.31	0.20	12.64	0.78					
()	-	-	0.20	3	0.75	-	-	0.20	6	0.83	-	-	0.20	6	0.83	26.00	6.84	0.10	36.17	0.72	-	-	0.20	3	0.75	-	-	0.20	6	0.83	26.00	6.84	0.10	36.17	0.72	-	-	0.20	6	0.83	26.00	6.84	0.10	36.17	0.72					

$$N = \frac{1 - P_{true}}{V_p^2(P_{true})} = \frac{1 - 10^{-2}}{(0.1)^2(10^{-2})} = 9900 \quad (m)$$

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N

P_{true} P_{true}

V_p^2

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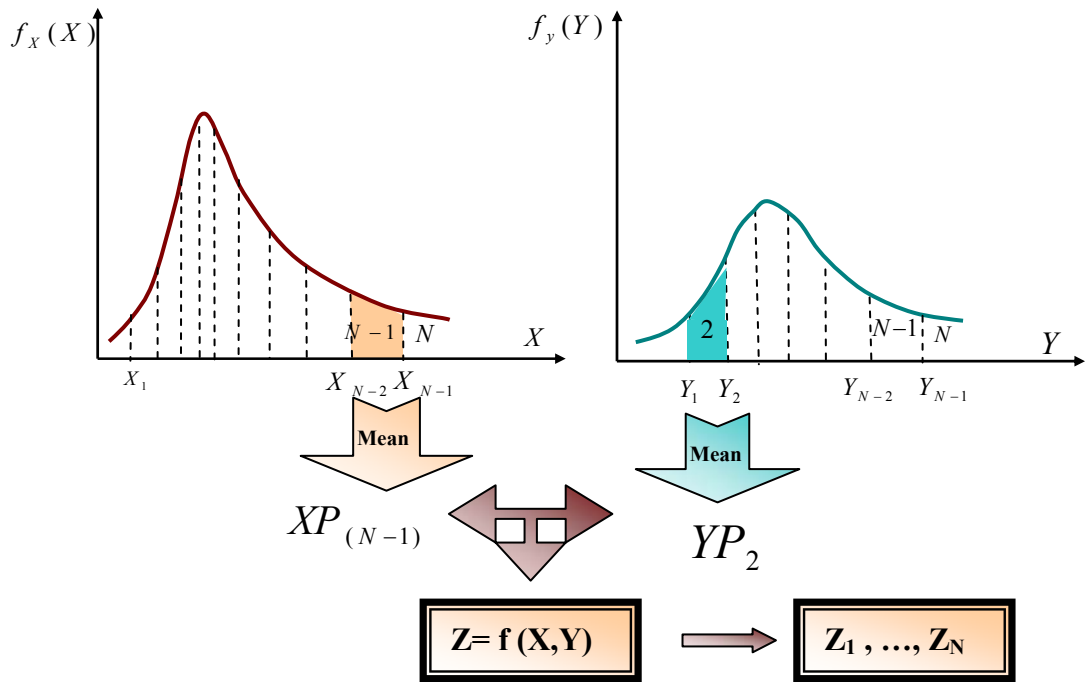
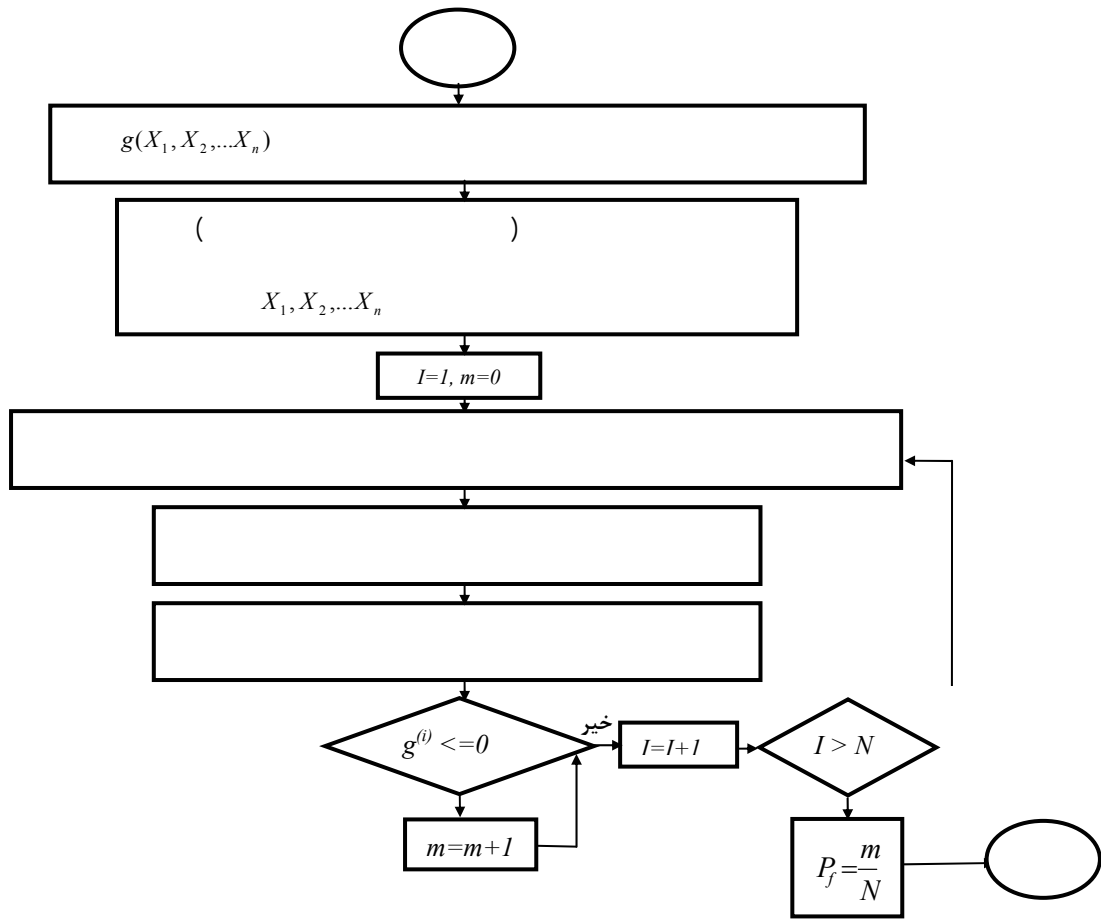
10^{-4}

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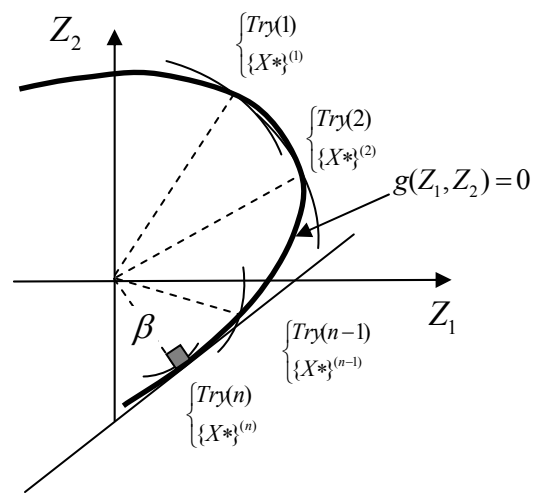
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$$g(X) = 0$$

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Z

N

$$Z = f(X_1, X_2, \dots, X_K)$$

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$$\text{Estimated mean value of } Z = \bar{Z} = \frac{1}{N} \sum_{i=1}^N z_i$$

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$$\text{Estimated } m^{\text{th}} \text{ moment of } Z = \frac{1}{N} \sum_{i=1}^N (z_i)^m$$

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$$P_{\text{failure}} = \frac{\text{number of times } z_i \leq \bar{Z}}{N}$$

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$$Z_i^* = \frac{X_i^* - \mu_{X_i}^e}{\sigma_{X_i}^e} \quad (1)$$

$$\begin{aligned} & i & : X_i^* \\ & i & : \mu_{X_i}^e \\ & i & : \sigma_{X_i}^e \end{aligned}$$

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$(\mu_{X_i}^e, \sigma_{X_i}^e)$

$$F_{Yn} - \sigma_{(Total\ Tension)} \leq 0 \quad (2)$$

$$F_{Crm} - \sigma_{(Total\ Compression)} \leq 0 \quad (3)$$

F_{Yn}, F_{Crm}

$f_x(x)$

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$F_x(x)$

$\sigma_{(Total\ Compression)}, \sigma_{(Total\ Tension)}$

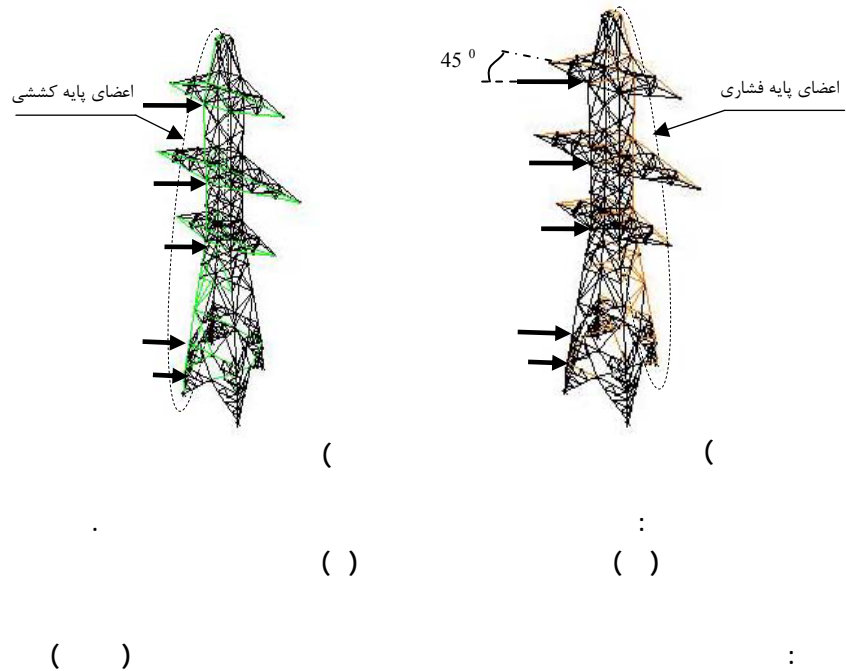
$$\mu_x^e = X^* - \sigma_x^e [\Phi^{-1}(F_x(X^*))] \quad (4)$$

$$\sigma_x^e = \frac{1}{f_x(X^*)} \phi\left(\frac{X^* - \mu_x^e}{\sigma_x^e}\right) = \frac{1}{f_x(X^*)} \phi[\Phi^{-1}(F_x(X^*))] \quad (5)$$

(L.H.S)

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(β)				()
		()		
2.13	6.43	1.87	4.09	()
2.25	6.04	2.03	3.84	()
1.60	6.96	1.92	4.52	()
1.69	6.55	1.69	4.56	()
6.5		4.25		

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j $S^{(j)}$
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 S

$$S^{(j)} = \sum_{i=1}^N (\log_{10} P_{fT} - \log_{10} P_{fj})^2 \cdot w_i \quad ()$$

$$\gamma_i = \frac{x_i^*}{\bar{X}_i} \quad ()$$

j $S^{(j)}$

β_T
 P_{fT} ()
 β_T .[] []

j (β_i) i
 i w_i

Normalized Factor		Load Factor	Resistance Factor	S _{min}		
Load Factor	Resistance Factor					
1.40	0.86	1.37	0.84	27.08		
1.40	0.94	1.32	0.89	47.22		
1.40	0.80	1.40	0.80	31.85		
1.40	0.98	1.29	0.93	34.98		
1.40	0.75	1.38	0.74	24.11		
1.40	0.91	1.26	0.82	37.73		
1.40	0.81	1.33	0.77	26.13		
1.40	0.94	1.28	0.86	52.62		

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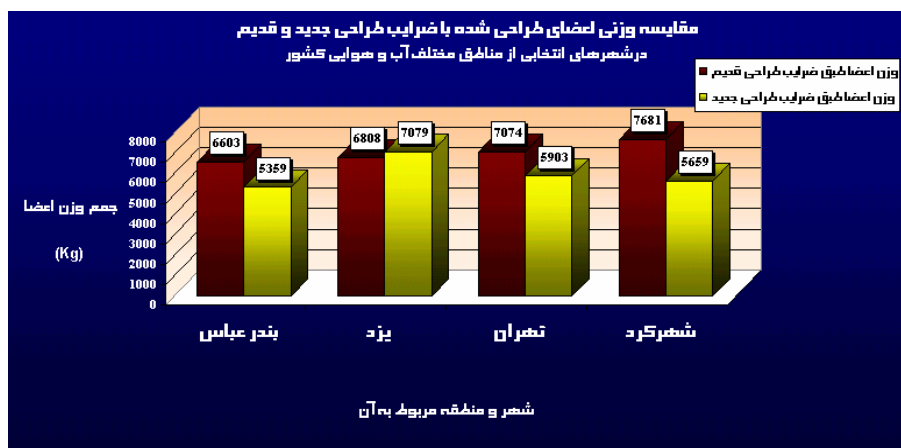
S⁽⁰⁾

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S.F _W					S.F _T					S.F _V		
W.L.	I.L.	D.L.	I.L.	D.L.	W.L.	I.L.	D.L.	I.L.	D.L.	S.F _W	S.F _T	S.F _V
2.48	1.73	1.1	1.58	1.1	2.48	1.73	1.1	1.58	1.1	2.50	1.65	1.50
1.06	1.28	1.1	1.28	1.1	1.09	1.28	1.1	1.28	1.1	1.10	1.10	1.10
1.17	1.16	1.1	1.16	1.1	1.11	1.16	1.1	1.16	1.1	1.10	1.10	1.10

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S.F _W					S.F _T					S.F _V		
W.L.	I.L.	D.L.	I.L.	D.L.	W.L.	I.L.	D.L.	I.L.	D.L.	S.F _W	S.F _T	S.F _V
2.42	1.73	1.1	1.30	1.1	2.66	1.66	1.1	1.51	1.1	2.50	1.65	1.50
1.06	1.28	1.1	1.03	1.1	1.17	1.20	1.1	1.20	1.1	1.10	1.10	1.10
1.14	1.16	1.1	1.02	1.1	1.26	1.11	1.1	1.11	1.1	1.10	1.10	1.10



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(D.L.)

(W.L.)

(I.L.)

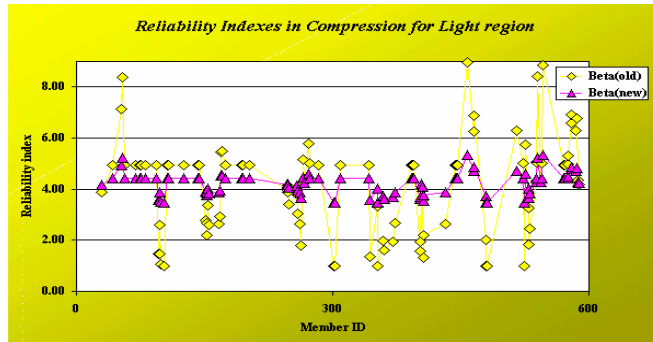
SF_T

SF_V

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(β)				()
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0.33	6.49	0.44	4.21	()
0.35	6.43	0.48	4.15	()
0.25	6.57	0.45	4.31	()
0.26	6.51	0.40	4.32	()

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Beta

230Kv

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1 - Target Reliability Index
3 - Design Factors
5 - RACKWIT-FIESSLERZ
7 - Limit State Function
9 - Importance Sampling Method
11 - HASOFER-LIND METHOD
13 - Load and Resistance Factors
15 - Weight factor

2 - Load and Resistance Factors
4 - MONTE - CARLO METHOD
6 - Failure
8 - Nowak
10 - Latin Hypercube Sampling
12 - Reliability Index
14 - Design Point
