EPM an ONET company
Engineering Planning and Management, Inc.
www.epm-inc.com

Genesis Solution Suite®

SAFE-R Risk Tools

Integrated software design to enable PRA Analysts and NFPA 805 Engineers to maintain Fire Probabilistic Risk Analysis data.

Efficiently control and navigate FPRA program information for risk insights, significance determinations or quantification. Perform what-if scenarios while maintaining configuration control.
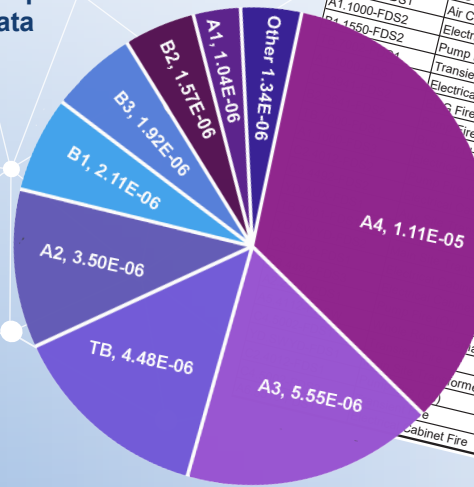
Features

+ **Maintain Fire PRA Scenario Data**

+ **Specify Fire Targets by Cable, Raceway, Equipment, and Basic Event**

+ **Maintain Ignition Source Data and Calculate Ignition Frequencies**

+ **Perform Cable Failure Mode Likelihood Analysis (CFMLA)**

+ **Automated Fire Altered Basic Event process**

+ **Generate a Ready-to-Quantify FRANX File Populated With Fire Scenarios, Target Sets, and Routing Data**

+ **Import Quantification Results from FRANX to support standardized results reporting**

+ **Scenario Impact Reports**

+ **Cable Damage Importance and Criticality Ranking**

PAU	Description	CDF	% Contribution
A1	Lower Hallway	1.04E-06	3%
A2	400 Elevation Aux Building	3.50E-06	11%
A3	Cable Spreading Room	5.55E-06	18%
A4	Main Control Room	1.11E-05	35%
A5	HVAC Room	1.15E-08	0%
A6	Office Space	0.00E+00	0%
B1	Feedwater Pump Room A	2.11E-06	7%
B2	Feedwater Pump Room B	1.57E-06	5%
B3	Feedwater Pump Room C	1.92E-06	6%
C1	Diesel Generator A Room	2.10E-07	1%
C2	Diesel Generator B Room	7.62E-07	2%
	EDG Building	1.11E-07	0%
	ture	2.51E-08	0%
		4.48E-06	14%
		1.08E-08	0%
			1%

Scenario	Description	CDF	% Contribution
A4.3345-FDS2	MCB Fire	3.40E-06	10%
A4.3345-FDS4	MCB Fire	2.11E-06	6%
A3.3100-FDS1	Transient Fire	1.25E-06	4%
TB.7004-FDS1	T/G Non-Catastrophic Fire	8.34E-07	3%
A2.2500-FDS1	Pump Fire (Electrical)	7.98E-07	2%
B3.3361-FDS1	Pump Fire (Oil)	6.93E-07	2%
TB.7004-FDS2	T/G Catastrophic Fire	6.84E-07	2%
TB.7003-FDS1	Air Compressor Fire	6.48E-07	2%
A1.1000-FDS2	Electrical Cabinet Fire No Suppression	4.52E-07	1%
B1.1650-FDS2	Pump Fire (Oil)	4.25E-07	1%
	Transient Fire	3.45E-07	1%
	Electrical Cabinet Fire	2.66E-07	1%
	Fire	2.10E-07	1%
	Fire (Electrical)	1.87E-07	1%
	EAF	1.32E-07	1%
	binet Fire Suppression	1.06E-07	0%
	ctrical)	8.62E-08	0%
	et Fire No Suppression	8.55E-08	0%
	mer Fire	5.60E-08	0%
		4.64E-08	0%
	mer Catastrophic	4.61E-08	0%
	Fire	3.10E-08	0%
	Fire Suppression	3.05E-08	0%
	age	1.94E-08	0%
		1.15E-08	0%
	mer Non-Catastrophic	8.23E-09	0%
		1.84E-09	0%
	Cabinet Fire	2.88E-10	0%
		2.30E-10	0%
		0.00E+00	0%

Pie chart: Other 1.34E-06; A1, 1.04E-06; B2, 1.57E-06; B3, 1.92E-06; B1, 2.11E-06; A2, 3.50E-06; TB, 4.48E-06; A3, 5.55E-06; A4, 1.11E-05

SAFE-R Module, Tools and Reporting

CFMLA Mapping Form

Equipment	Logic Classification	ACP	Cable	Component Type	Single Or Double Break
1-AFW-A	WAWTEST	WAW	008-CABLE3	MOV	SINGLE
1-AFW-A	WAWTEST	WAW	008-CABLE4	SOV	SINGLE
1-AFW-A	WAWTEST	WAW	008-CABLE5	MOV	DOUBLE
1-AFW-B	1-ALL	TEST-ACP-1	1ATXCNC030	MOV	SINGLE
1-AFW-B	1-ALL	TEST-ACP-1	1CESANX001	SOV	SINGLE
1-AFW-B	1-ALL	TEST-ACP-1	1CESANX900	SOV	SINGLE
1-AFW-B	1-ALL	TEST-ACP-1	1DGSUPC604	MOV	SINGLE

NOTE: To refresh data associated with Cable and Equipment use function 'Refresh Associated Data'.

Data | Fire Zones*

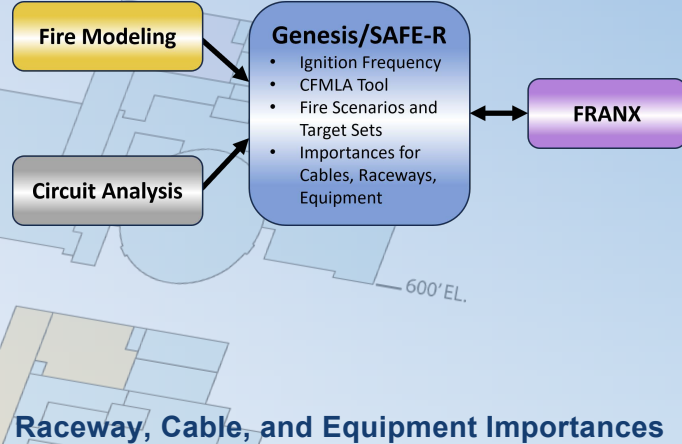| Field	Value	Field	Value
Equipment:	1-AFW-B	Cable:	1ATXCNC030
Logic Classification:	1-ALL	ACP:	TEST-ACP-1
Spurious Mode:	SPUR OPEN	Equipment Type:	UNKNOWN
Component Type:	MOV	Failure Mode:	
Single Or Double Break:	SINGLE	Inter-Cable HS:	YES
Intra-Cable HS:	NO	GFEHS:	NO
Forced Aggregate:		Define Trunk Cable:	12 CONDUCTOR
Trunk Cable:	NO	Power Type:	GROUNDED AC
NUREG/CR-7150 Table:	TABLE 4-3	'To Endpoint' is Panel:	YES
'From Endpoint' is Panel:	NO	Remarks:	
CFMLA Updated By:	FPRA_RW2	CFMLA Updated Date:	8/2/2021

Conditional Probability

Fire Zone:	1-CR-3, 1-CR-4, 1-NS-1, 1-TB-1A, 1-TR-2, 1-TR-3, 3-YARD-1	Conditional Probability:	0.28, 0.0088
Override Conditional Prob:	NO	Conditional Probability Oride:	

Ignition Frequency Calculation

Bin ID	Bin Ignition Source	Bin Type	Bin Features
14	ELECTRIC MOTORS	FIXED	ELECTRIC MOTOR
15	ELECTRICAL CABINETS	FIXED	ELECTRICAL CABINET
16.1	HEAF FOR SEGMENTED BUS DUCTS	FIXED	HEAF
16.2	HEAF FOR ISO-PHASE BUS DUCTS	FIXED	HEAF
16.A	HEAF FOR LOW-VOLTAGE ELECTRICAL CABINETS (480-1000 V)	FIXED	HEAF
16.B	HEAF FOR MEDIUM-VOLTAGE ELECTRICAL CABINETS (>1000 V)	FIXED	HEAF

Data | Documents | Notes

Field	Value	Field	Value
Bin ID:	15	Bin Plant Location:	PLANT WIDE COM
Bin Ignition Source:	ELECTRICAL CABINETS	Bin Type:	FIXED
Bin Power Mode:	ALL PLANTS AT POWER	Bin Frequency (sn):	3.0E-02
Bin IGN Reference:		Bin Notes:	
Bin Features:	ELECTRICAL CABINET	Bin Total Count:	1561
Location Weighting Factor:	2	Plant Availability Factor:	9.0E-01
Adjusted Plant Frequency (sn):	5.4E-02	Per Source Frequency (sn):	3.5E-05
Remarks:	NUREG-2169		

Fire Modeling → Genesis/SAFE-R

Genesis/SAFE-R
- Ignition Frequency
- CFMLA Tool
- Fire Scenarios and Target Sets
- Importances for Cables, Raceways, Equipment

Circuit Analysis → Genesis/SAFE-R ↔ FRANX

600' EL.

Raceway, Cable, and Equipment Importances

FPRA Raceway

Raceway	Fussell Vesely Importance CDF	Fussell Vesely Importance LERF
0UC907N09	0.0001205661260420	0.0001347581406040
1CC047NC1	0.0537660768464840	0.1237324644311760
1CC281ND2	0	0
1CC281NE	0	0
1CC281NF	0	0
RAC1_NXA	0.0001205661260420	0.0001347581406040
STC-021RW1	0.0268830384232420	0.1237324644311760

Scenario: *FC00.Source-FDS1*

Raceway	Cable	% Contribution
TRAY1		16.5%
	CABLE1	5.5%
	CABLE2	11.0%
TRAY2		15.8%
	CABLE3	2.0%
	CABLE4	5.8%
	CABLE5	8.0%
TRAY3		7.5%
	CABLE1	5.5%
	CABLE3	2.0%

Genesis Solution Suite

SAFE-R Version 2.0.0

Minimum System Requirements:
Server:
Database Management System
Oracle® 11g (or greater)
Operating System - Microsoft® Windows Server 2012 (or greater) or Unix/Solaris
Disk Space - 1 GB (minimum)
Memory - 8 GB (minimum)

Client:
Adobe Acrobat
Microsoft Office 2013 (or greater)
Operating System - Microsoft® Windows 10
Disk Space - 1 GB (minimum)
Memory - 6 GB (minimum)
Microsoft®.NET Framework 4.6.1

EPM
an ONET company
Engineering Planning and Management, Inc.

Engineering Planning and Management, Inc.

959 Concord Street, Suite 310
Framingham, MA 01701
Phone: 508-875-2121

www.epm-inc.com

Genesis Solution Suite® is a registered trademark of EPM, Inc.