



**NUREG 2180 Event Tree Spreadsheet for Area-wide Fire
Detection. Version 2180.0 (English Units).
Draft for April 26th WORKSHOP**

The following calculations estimate the non-suppression probability for using areawide smoke detection.

Parameters in YELLOW CELLS are Entered by the User.

Parameters in GREEN CELLS are Automatically Selected from the DROP DOWN MENU.

All subsequent output values are calculated by the spreadsheet and based on values specified in the input parameters. This spreadsheet is protected and secure to avoid errors due to a wrong entry in a cell(s). The chapter in the NUREG should be read before an analysis is made.

Project / Inspection Title:

INPUT PARAMETERS

Detection System Unavailability/Unreliability Probability
Fraction of Fires that DO NOT have an Incipient Stage
System In-Effectiveness
Human Error Probability for MCR Operator Response
Human Error Probability for Field Operator Response <small>NOTE: DEFAULT VALUE</small>

β

α

τ

μ

ξ

Electrical non-suppression rate parameter ($\lambda_{1(\text{Electrical})}$)
Enhanced non-suppression rate parameter ($\lambda_{1(n3)}$)

1.0E+00	β
1.0E+00	α
1.0E+00	τ
1.0E-04	μ
1.0E+00	ξ
1.0E+00	π_2
1.0E+00	η_1
1.0E+00	η_2
1.0E+00	η_3

Conventional Suppression

Enter Time to Target Damage (Minutes):

Is there a redundant automatic fire detection system protecting the electrical enclosure?

Yes No

Failure Probability

Enter time for redundant automatic fire detection response

Time (Minutes):

Is there an automatic fire suppression system protecting target of interest?

Yes No

Automatic Suppression Failure Probability

Is the automatic suppression system dependant on the redundant automatic detection system?

Yes No

Is there manual fixed suppression?

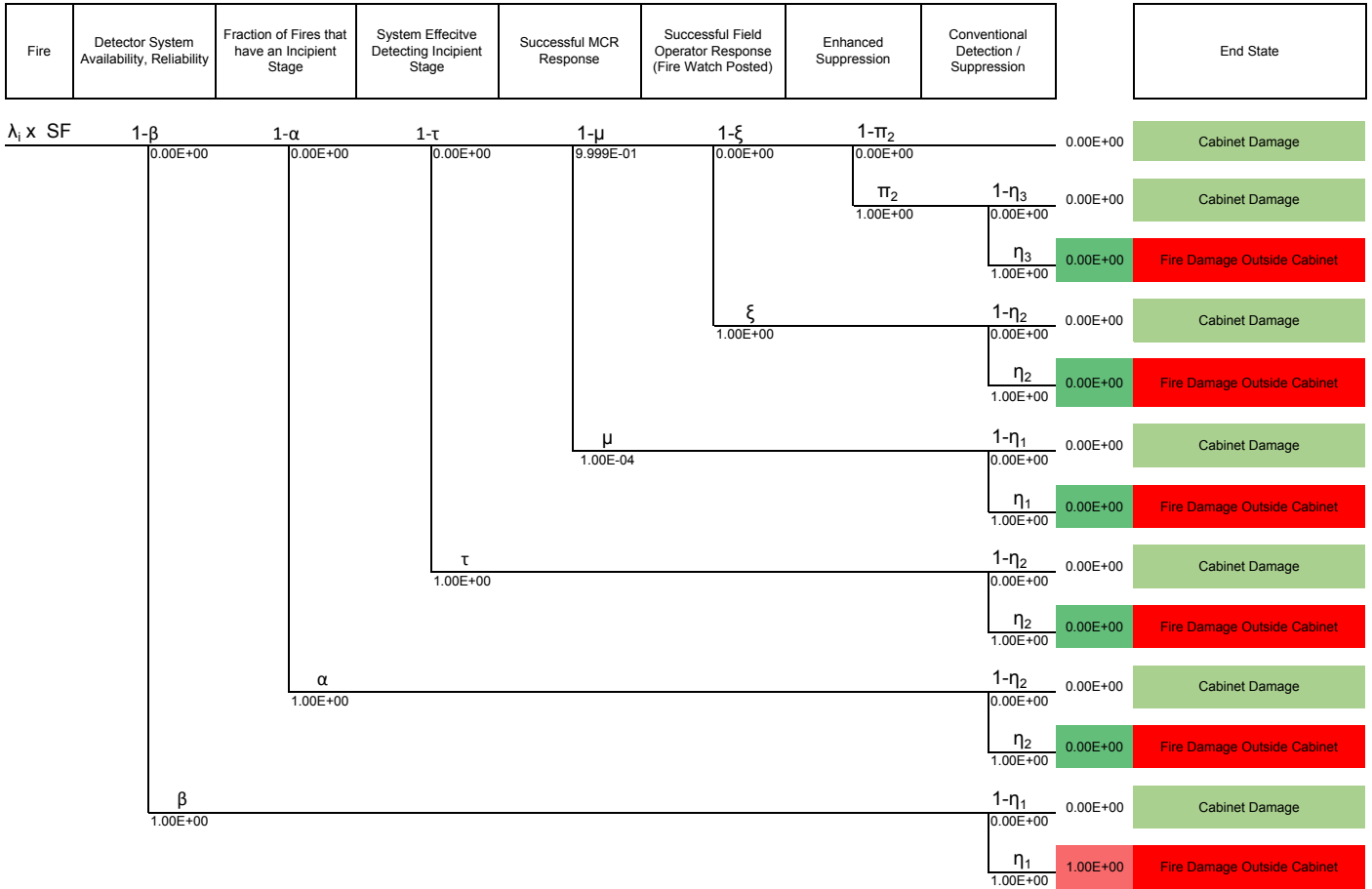
Yes No

Manual Fixed Suppression Failure Probability

RESULTS

Total Non-Suppression Probability:

Area-wide



Pr(non-supp)= 1.00E+00

Event Tree For η1

Fire	Automatic		Manual			Sequence	End State	Pr (Non-Suppression)
	Detection	Suppression	Detection	Fixed	Fire Brigade			
FI	AD	AS	MD	MF	FB			
1.000	0.00E+00	0.00E+00				F	OK	
		1.00E+00				G	OK	
			0.00E+00			H	OK	
				1.00E+00		I	NS	0.00E+00
					0.00E+00	J	OK	
	1.00E+00	0.00E+00				K	OK	
		1.00E+00	0.00E+00	0.00E+00		L	OK	
				1.00E+00	0.00E+00	M	NS	0.00E+00
					1.00E+00	N	NS	1
			1.00E+00			Total		1.00E+00

Event Tree For η2

Fire	Automatic		Manual			Sequence	End State	Pr (Non-Suppression)
	Detection	Suppression	Detection	Fixed	Fire Brigade			
FI	AD	AS	MD	MF	FB			
1.000	1.00E+00	0.00E+00				F	OK	
		1.00E+00				G	OK	
			0.00E+00			H	OK	
				1.00E+00		I	NS	1.00E+00
					0.00E+00	J	OK	
	0.00E+00	0.00E+00				K	OK	
		1.00E+00	0.00E+00	0.00E+00		L	OK	
				1.00E+00	0.00E+00	M	NS	0.00E+00
					1.00E+00	N	NS	0.00E+00
			1.00E+00			Total		1.00E+00