



**NUREG 2180 Event Tree Spreadsheet for
In-Cabinet Fire Detection, Version 2180.0
DRAFT for April 26th WORKSHOP**

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

Parameters in **YELLOW CELLS** are Entered by the User.

Parameters in **GREEN CELLS** are Automatically Selected from the DROP DOWN MENU for the Cable Technology Selected.

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 β

Fraction of Fires that DO NOT have an Incipient Stage α

System In-Effectiveness τ

1.00E+00	β
1.00E+00	α
1.00E+00	τ

Human Error Probability for MCR Operator Response μ

Human Error Probability for 1st Level Field Response ξ

1.00E-04	μ
1.00E+00	ξ
1.00E+00	π_1
1.00E+00	η_2
1.00E+00	η_3

Electrical non-suppression rate parameter ($\lambda_{ELECTRICAL}$)

MCR non-suppression rate parameter (λ_{MCR})

Enter Time to Target Damage (in Minutes)

Is there a **redundant automatic fire detection** system protecting the electrical enclosure?
 Yes No

Redundant Auto Detection Failure Probability

Enter **time to detection** for redundant automatic fire detection response (in Minutes)

Time (Minutes):

Conventional Detection/ Suppression

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 protecting the area?
 Yes No

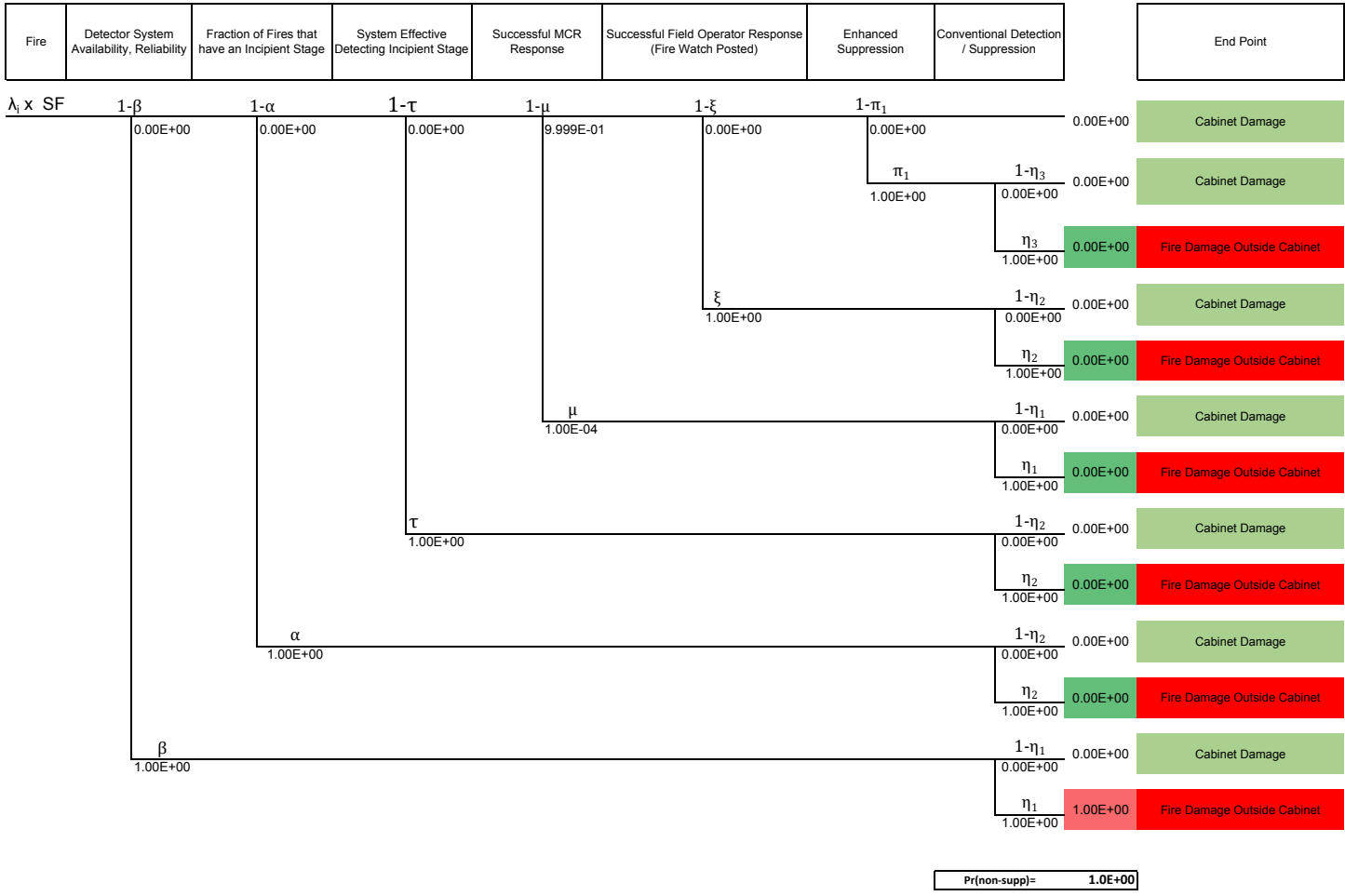
Is there manual fixed **suppression**?
 Yes No

Manual Fixed Suppression Failure Probability

RESULTS

Total Non-Suppression Probability :

In-Cabinet



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					K	OK	
		0.00E+00				L	OK	
		1.00E+00	0.00E+00			M	NS	0.00E+00
				0.00E+00		N	NS	1.00E+00
					0.00E+00			
					1.00E+00			
			1.00E+00					
				1.00E+00				
					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					K	OK	
		0.00E+00				L	OK	
		1.00E+00	0.00E+00			M	NS	0.00E+00
				0.00E+00		N	NS	0.00E+00
					0.00E+00			
					1.00E+00			
			1.00E+00					
				1.00E+00				
					1.00E+00			
						Total		1.00E+00