




# DESIGNING A FIRE DETECTION AND ALARM SYSTEM FOR A RESTAURANT



# Abstract

In this presentation, we are discussing and designing about fire detection and alarm system, protection and safety for a restaurant with proper equipment's have identified the possible locations and causes for fire hazard. We are also choosing suitable tools by comparing different types of detectors, alarms, and protection equipment's and mentioned the brand of the tools. We have also showed block diagram with working principle of the entire system. At last we have showed the types and numbers of equipment's required in each section of the restaurant.

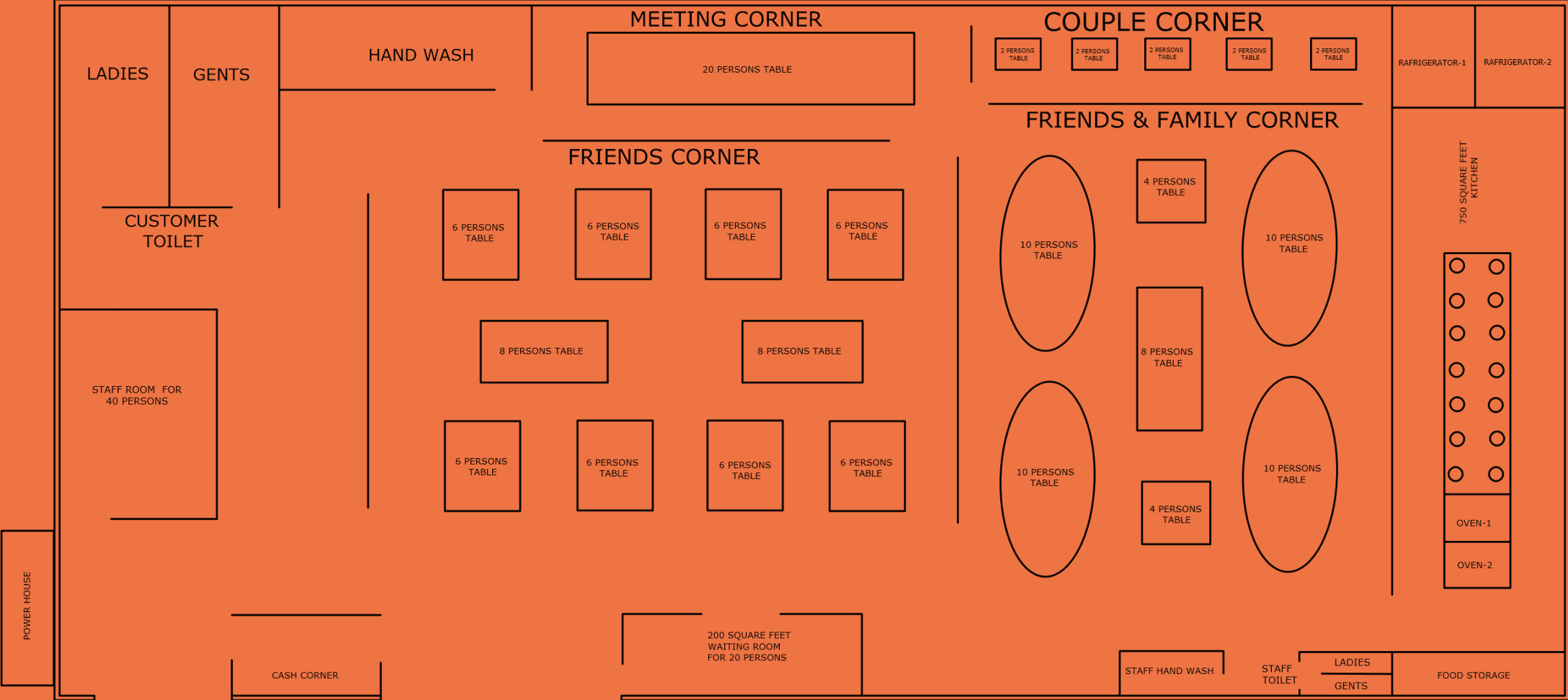
# Course Outcome

- CO3: Design electrical building service systems subject to specifications and constraints considering applicable standards and codes.
  - CO4: Prepare and present basic technical documentation of a new building services system.
  - CO5: Consider safety and societal issues in design of electrical service systems for buildings.
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60 FEET

# RESTAURANT LAYOUT

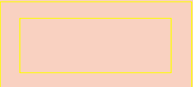


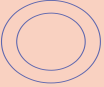
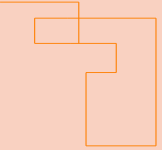
40 FEET



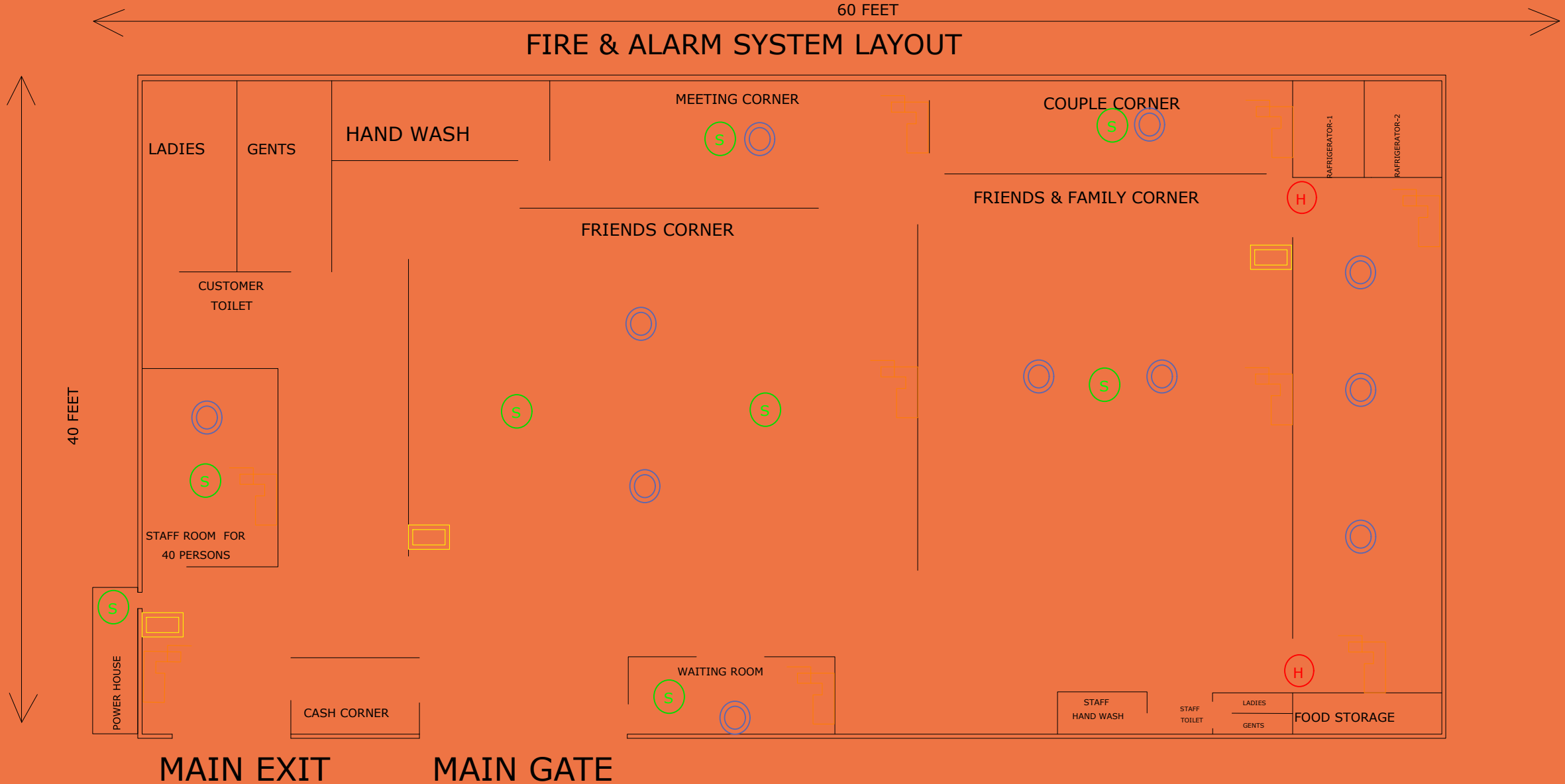
MAIN EXIT

MAIN GATE

# Symbols

Fire alarm	
Smoke sensor	
Heat sensor	
Sprinkler	
Fire Extinguisher	

# FIRE & ALARM SYSTEM LAYOUT



# Possible location & causes of fire hazard

## Possible location

Dining

Kitchen

Waiting room

Stuff room

Power house

## Causes of fire hazard

Human error  
&  
Negligence

Smoking

Candles  
& other  
open flames

Kitchen fires  
from  
Unattended  
Cooking

Overloading  
Power sockets

# Equipment for Fire Safety



**Sprinkler**



**Heat Sensor**



# Equipment for Fire Safety



Fire  
Extinguisher



Smoke Sensor



# Equipment for Fire Safety



Fire Alarm

# Equipment for Fire Safety (Collected)



# Comparison between fire alarms

Conventional

All wired to the same cable that connects them to a fire alarm control panel.

Addressable

Its components have individual unique identifiers.

# Comparison between detectors

Heat sensor

Smoke detectors are very sensitive and are prone to give off false alarms

Smoke sensor

Heat detectors will not detect slightest amount of temperature changes

# Comparison between fire extinguisher

## Water

Combustible materials  
(Paper and wood)

## Wet Chemical

- Combustible materials
- Deep fat fryers (chip pans)

## CO2

- Flammable liquids (paint & petrol)
- Electrical equipment

## Foam

- Combustible materials
- Flammable liquids

## Dry Powder

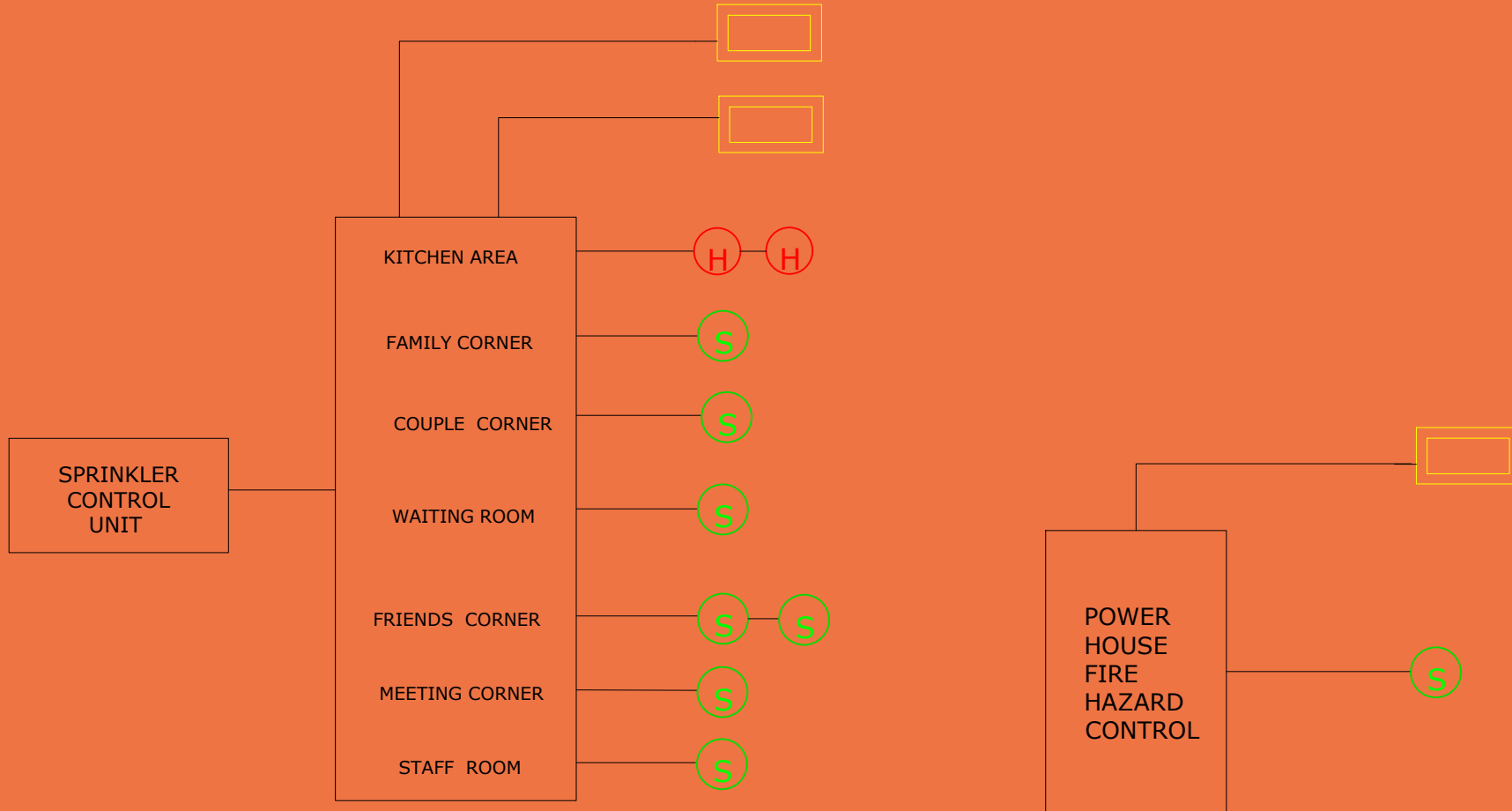
- Combustible materials
- Flammable liquids
- Flammable gases
- Flammable metals
- Electrical equipment



# EQUIPMENT DETAILS

Equipment	Brand	Model	Details	Price range/piece
Sprinkler	CA-FIRE	K25	Connecting Thread: R1/2 or R3/4 TemperatureRating:57,68,79,93 Bulb: 3mm/5mm	\$10.00 - \$10.50
Heat sensor	ASENWARE	AW-D302	Operating voltage : Loop 24V(18V~28V) Standby Current:<0.3mA	\$22.00 -\$23.00
Extinguisher	Wofu Welfare	0.5KG to 100KG	working temperature:-25C to +55C Working pressure:1.2Mpa	\$0.56 - \$150.00
Smoke sensor	CCE	SD202	working current: <40mA Frequency:315MHz/433MHz Distance :<120m size:107*44mm	\$2.00 - \$5.00
Fire Alarm	HEIMAN	HM-626PHS	Battery Type:3V sealed lithium battery	\$1.00 - \$8.00

# CONTROL UNIT



# Numbers of equipment & costing

Location	Heat Sensor	Smoke Sensor	Sprinkler	Fire Extinguisher	Fire Alarm	Cost
Kitchen	2	-	3	2	1	\$91
Dining	-	5	6	4	1	\$110
Waiting room	-	1	1	1	-	\$20
Power house	-	1	-	1	1	\$20
Stuff room	-	1	1	1	-	\$15

Total costing for equipment: **\$256**

# Conclusion

Fire security system is important for every commercial property like hospital, restaurant, educational institute etc. fire alarm system basically saves our life it gives easy signal to something that could be tragic, so it is very important

# References

- <https://www.alibaba.com/?spm=a2700.7724838.scGlobalHomeHeader.9.499a4cc3tIrxrJ>
- [https://en.wikipedia.org/wiki/Fire\\_safety](https://en.wikipedia.org/wiki/Fire_safety)
- <https://www.youtube.com/watch?v=rFu-XHXzBF8>
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