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สาขาวิชาวิศวกรรมคอมพิวเตอร์
คณะวิศวกรรมศาสตร์ มหาวิทยาลัยนครพนม

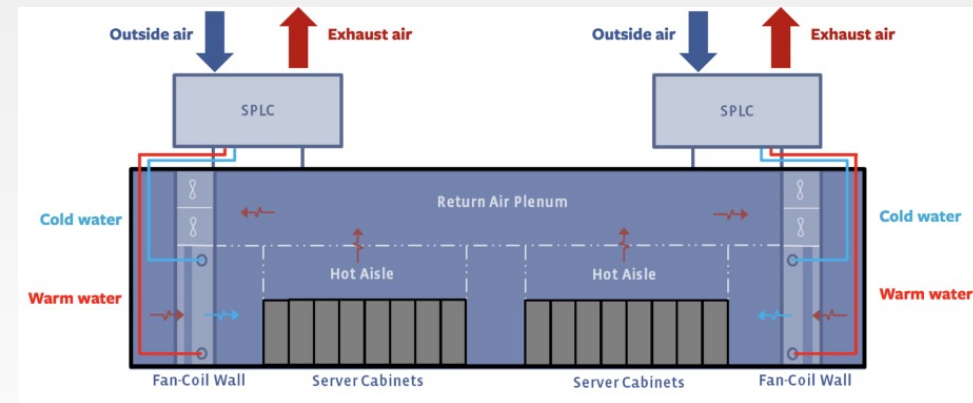
Revised 2023-01-03

D3: Physical Security

สาขาวิชาวิศวกรรมคอมพิวเตอร์

Topic

- Site and Facility Security
- The Site Planning Process
- Crime Prevention Through Environmental Design (CPTED)
- Design a Physical Security Program



Physical security goal

- Crime and disruption prevention through deterrence Fences, security guards, warning signs, and so forth
- Reduction of damage through the use of delaying mechanisms Layers of defenses that slow down the adversary, such as locks, security personnel, and barriers
- Crime or disruption detection Smoke detectors, motion detectors, CCTV, and so forth
- Incident assessment Response of security guards to detected incidents and determination of damage level
- Response procedures Fire suppression mechanisms, emergency response processes, law enforcement notification, and consultation with outside security professionals

Performance metrics

- Number of successful crimes
- Number of successful disruptions
- Number of unsuccessful crimes
- Number of unsuccessful disruptions
- Time between detection, assessment, and recovery steps Business impact of disruptions
- Time it took for a criminal to defeat a control
- Time it took to restore the operational environment
- Financial loss of a successful crime
- Financial loss of a successful disruption
- Number of **false-positive** detection alerts

Confusion matrix

- False-Positive (FP)
- True-Positive (TP)
- False-Negative (FN)
- True-Negative (TN)

	Predicted 0	Predicted 1
Actual 0	TN	FP
Actual 1	FN	TP

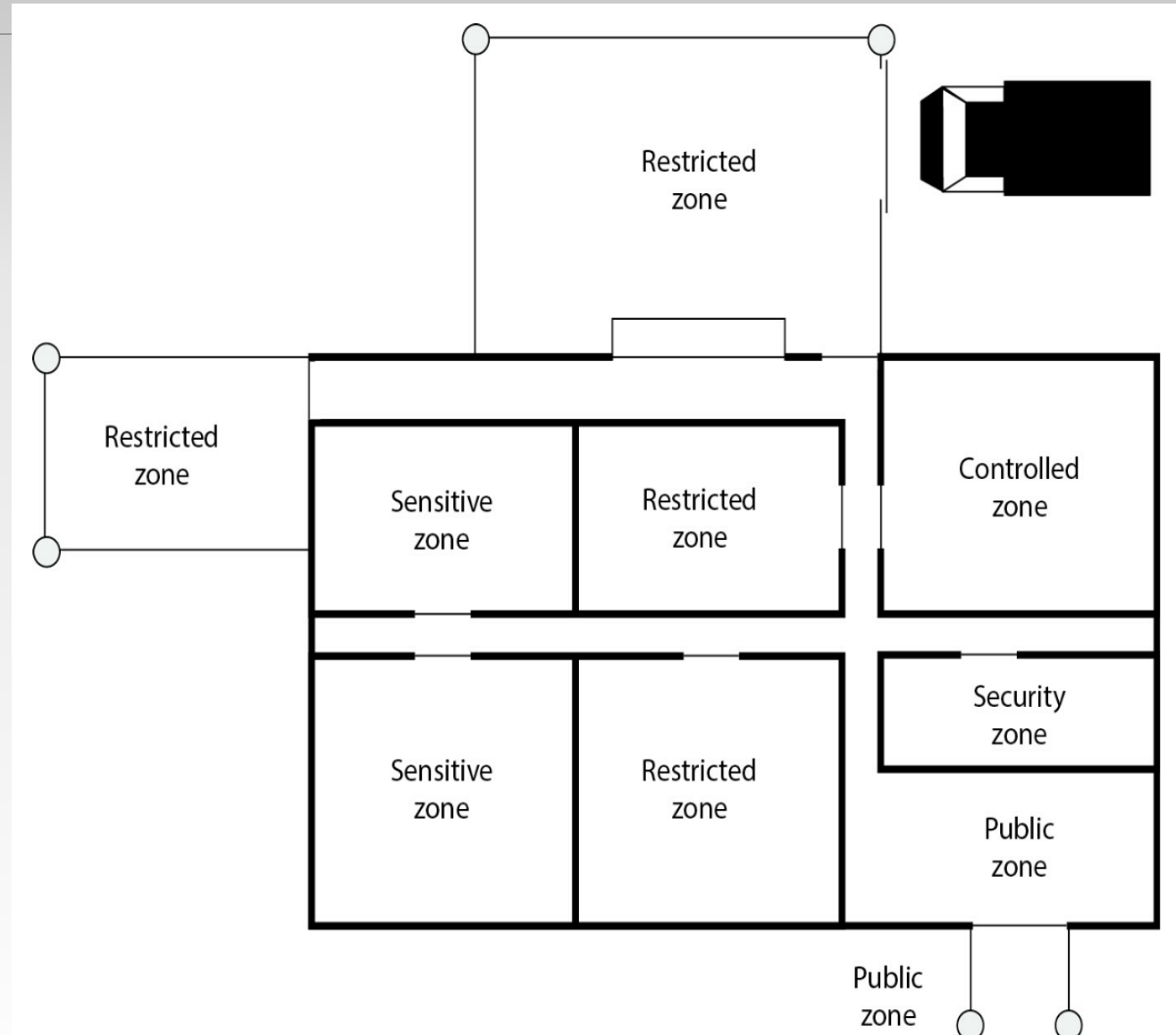
Natural Access Control

- Sidewalks, lights, landscaping can be used for protection



Access control

- Access control should be in place to control and restrict individuals from going from one



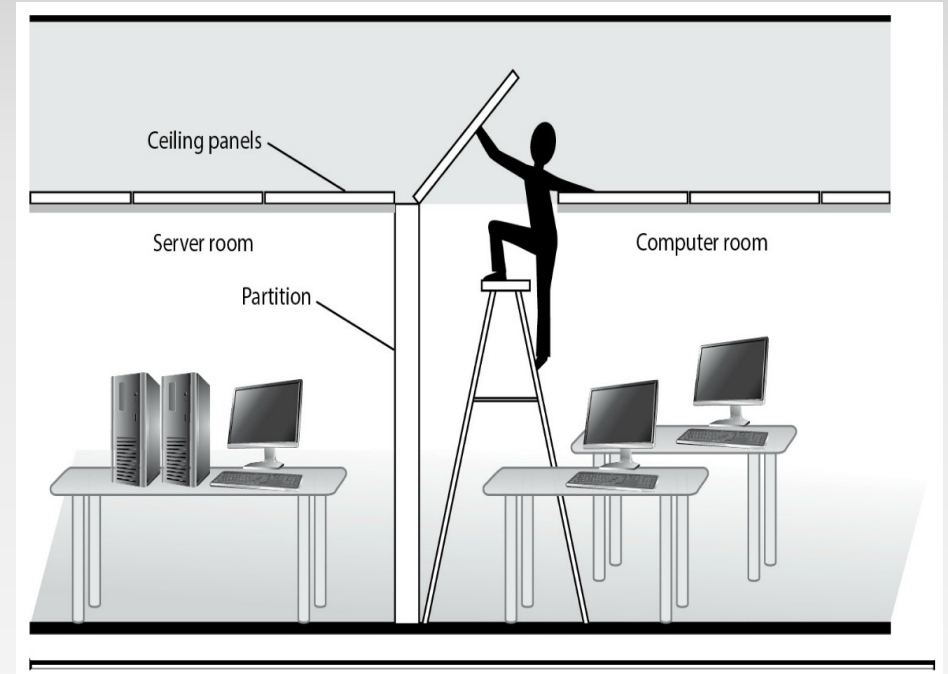
Natural Surveillance

- Open areas reduce the likelihood of criminal activity
- Parking garage designed to be open and allow easy observation
- Security guards
- CCTC
- Natural strategies
 - Low landscaping
 - Raised entrances



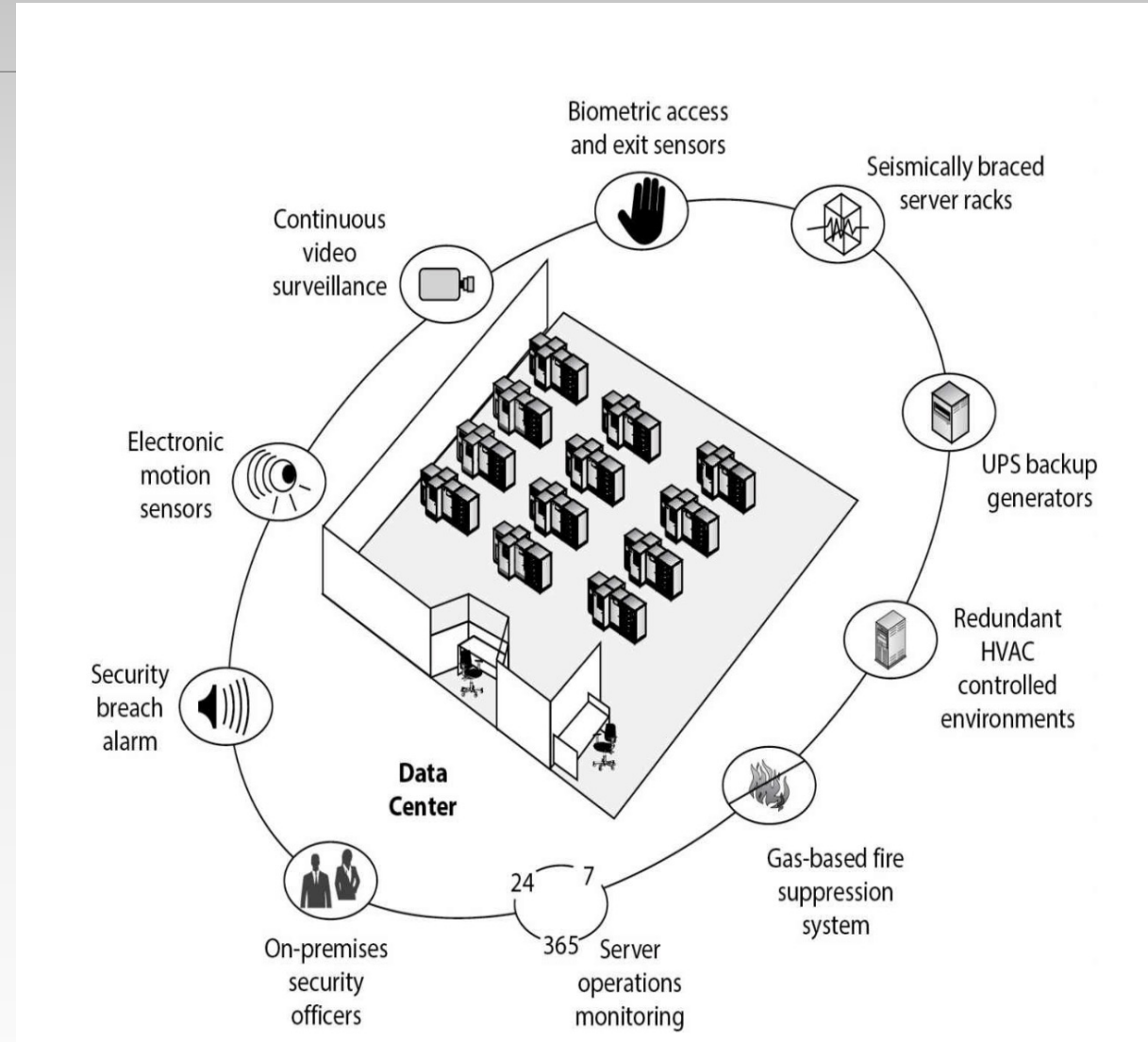
Designing a Physical Security Program

- Every organization should have a **facility safety officer**
- The programs
 - Deterrence of criminal activity
 - Delay of intruders
 - Detection of intruders
 - Assessment of situations
 - Response to intrusions and disruptions



Data center

- Many physical security controls in data center

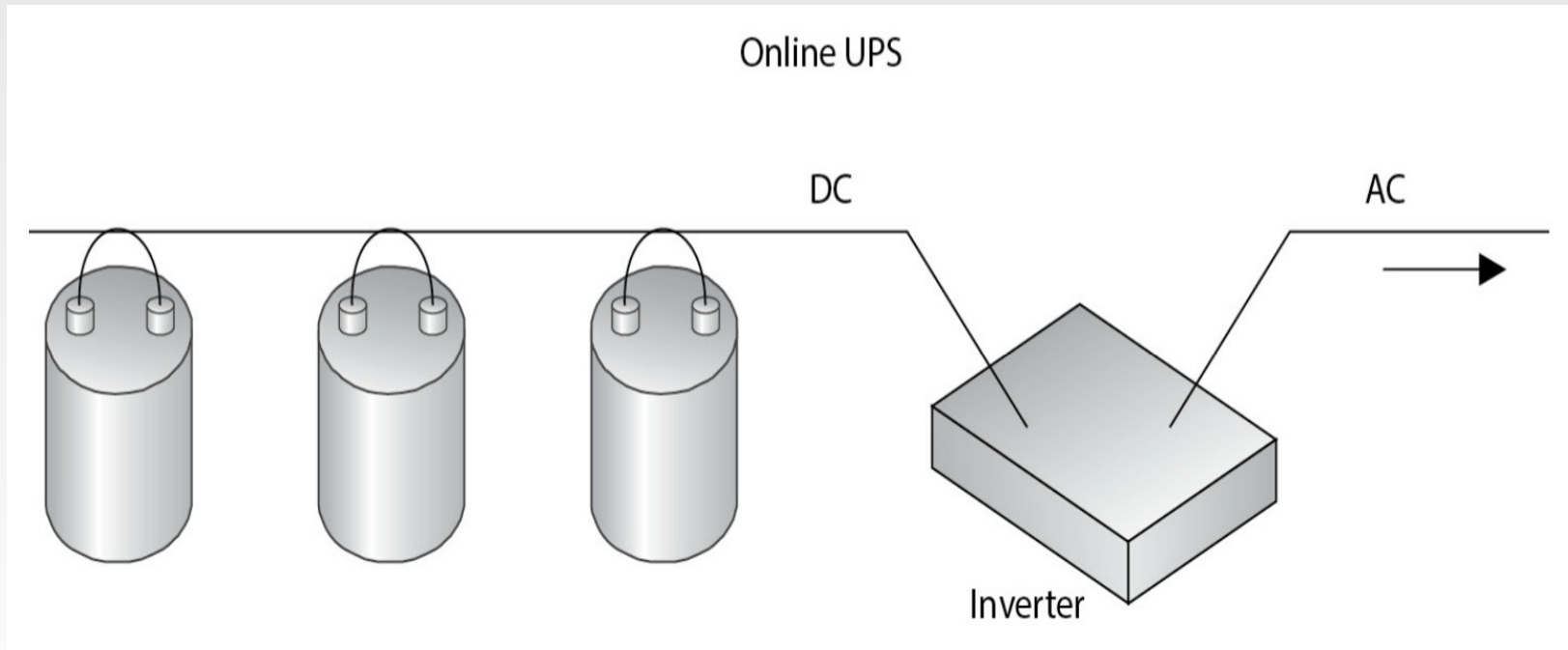


Power Protections

- Three ways:
 - เครื่องสำรองไฟ (Uninterruptible power supply (UPS))
 - Backup sources
 - Power line conditioners

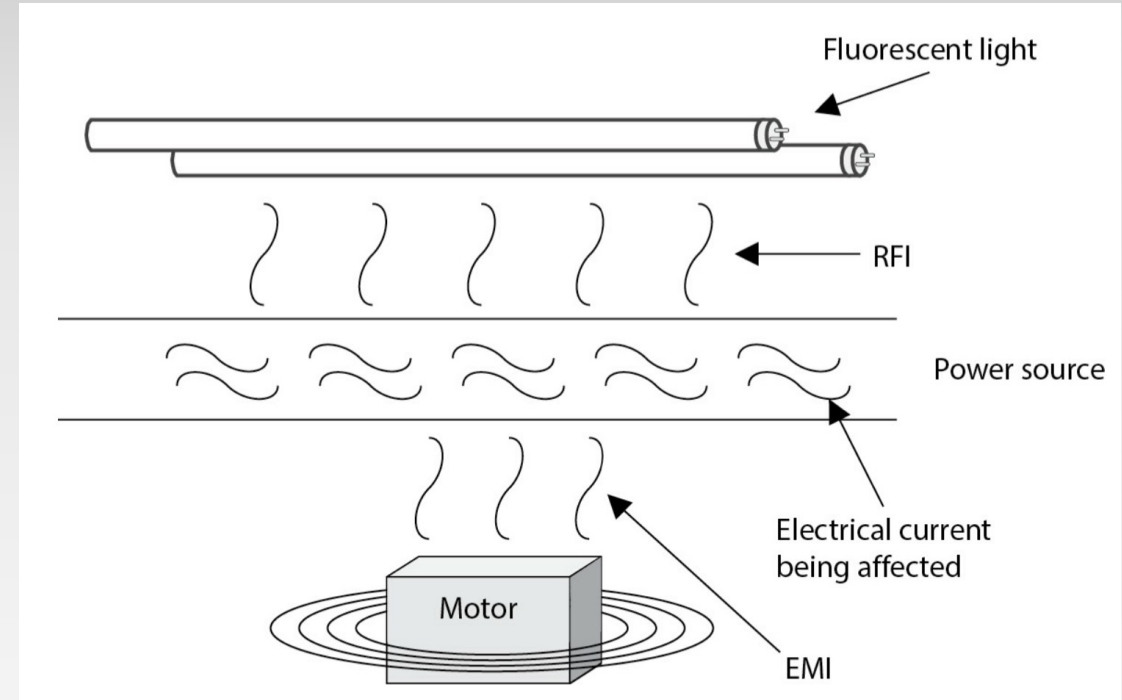
ระบบสำรองไฟ

- Uninterruptible power supply (UPS)
- Type :
 - Online
 - Standby



Line noise

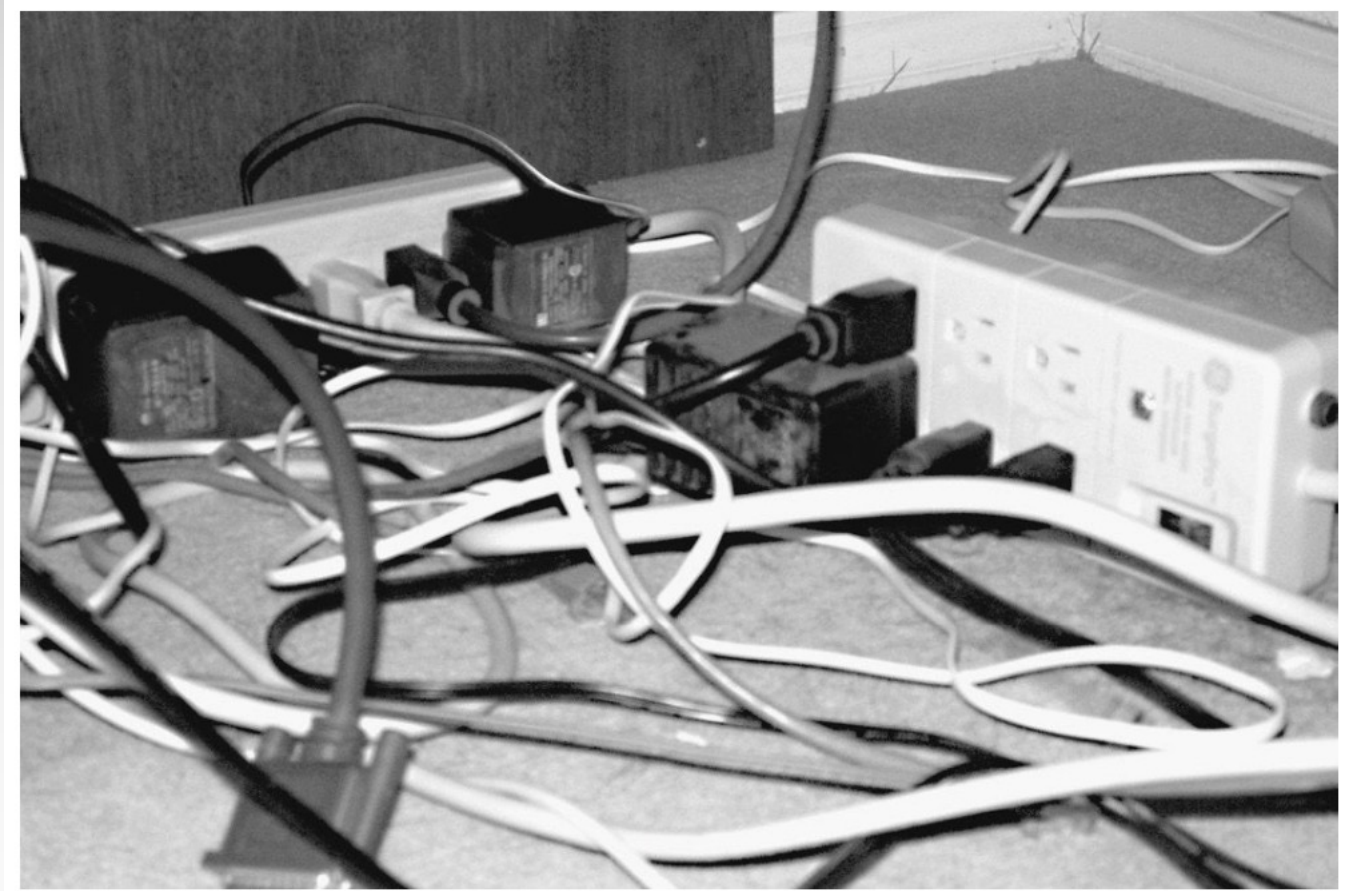
- radio frequency interference(RFI) และ electromagnetic interference(EMI) เป็นสาเหตุของสัญญาณรบกวนในสายส่ง
- Lightning and electrical motors can induce EMI
- RFI can be caused by anything that creates radio waves



Fire Prevention, Detection, and Suppression

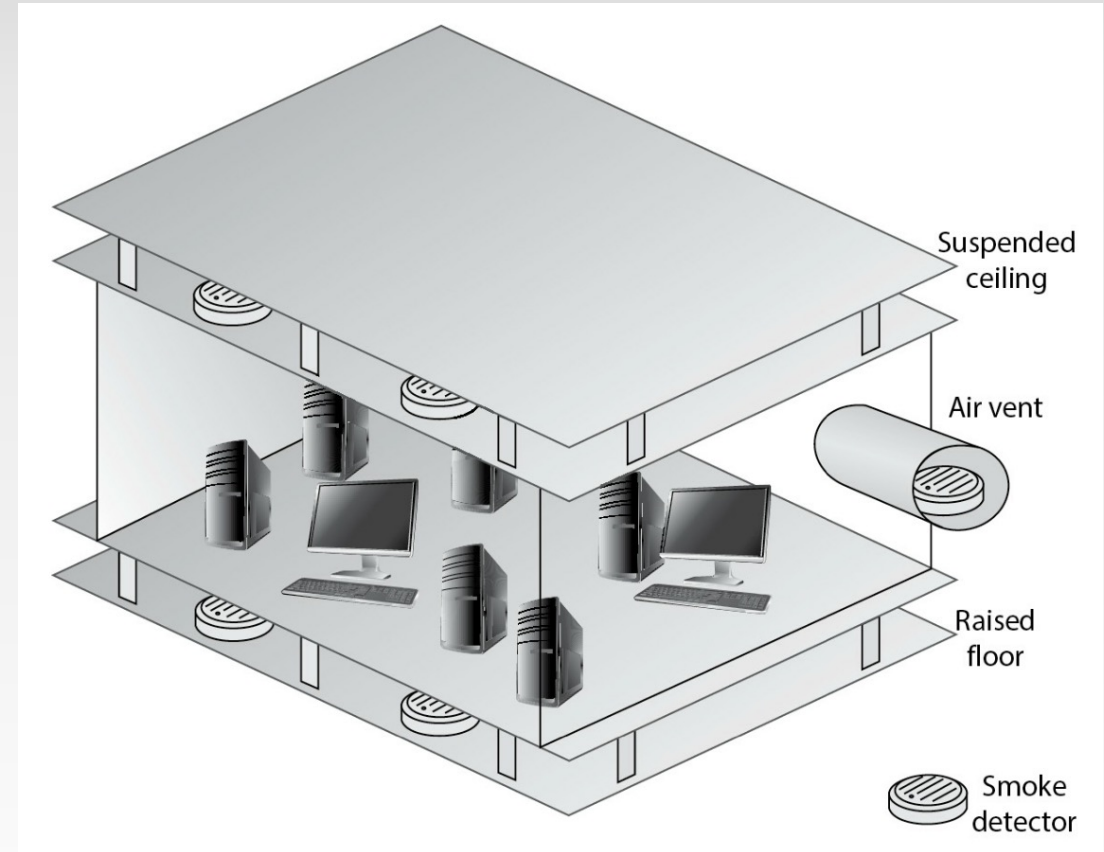
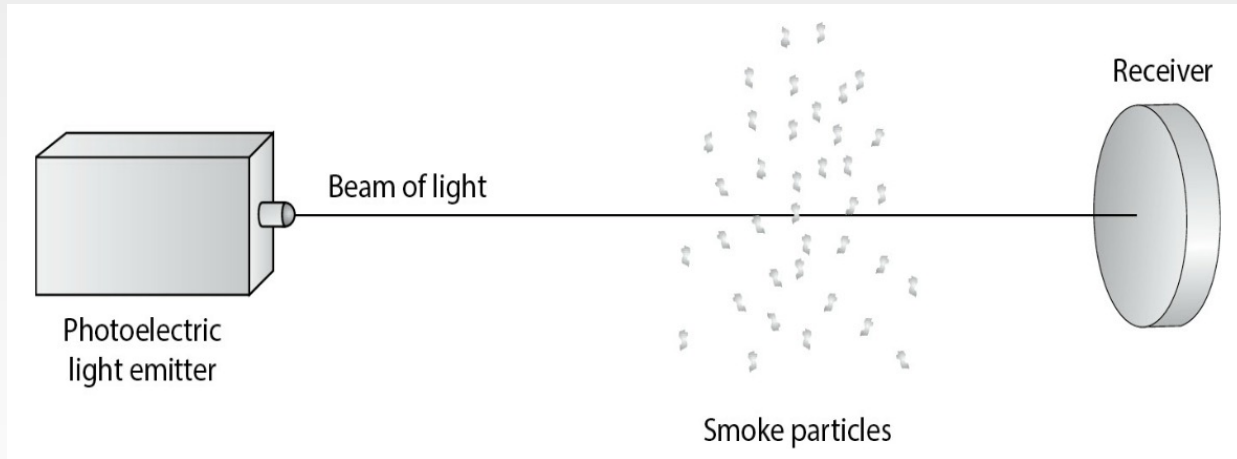
- **Fire Prevention**

- สภาพแวดล้อมทำให้เกิดความเสี่ยงไฟไหม้



Fire detection

- Sensor ตรวจจับควัน และ อุณหภูมิ
- Smoke Activated Smoke-activated
- Smoke detectors

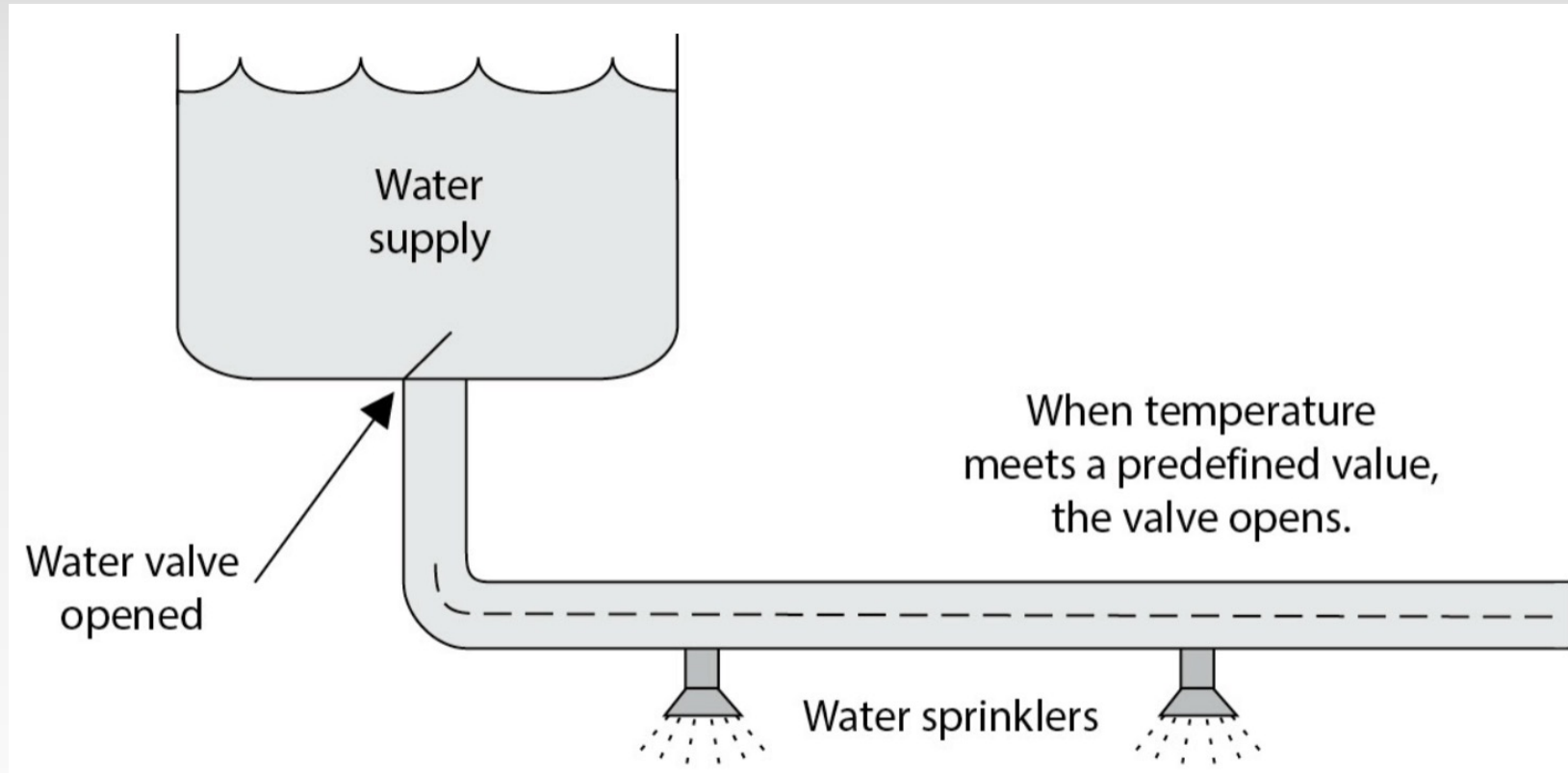


Fire supression



Water Sprinklers

- Dry pipe system



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Security Architecture and Engineering