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# Introduction to Alarm Assessment

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- In this module, photos of equipment are included as examples only
- Sandia National Laboratories does not endorse or recommend any specific equipment

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# Module Objectives

- Describe fundamentals of alarm assessment
- Understand purpose and importance of alarm assessment in a physical protection system
- Understand the role of personnel, on-site guards and/or local police in assessment of alarms
- Understand difference between assessment and surveillance
- Two exercises to stimulate assessment thought processes

# Module Outline

- Purpose
- Methods – people, technology
- Definitions
- Key points
  - Assessment
  - Surveillance

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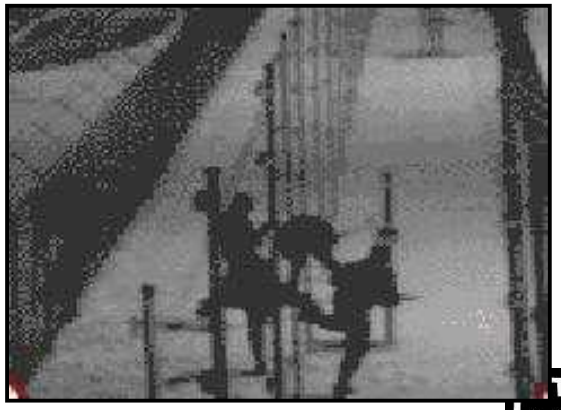
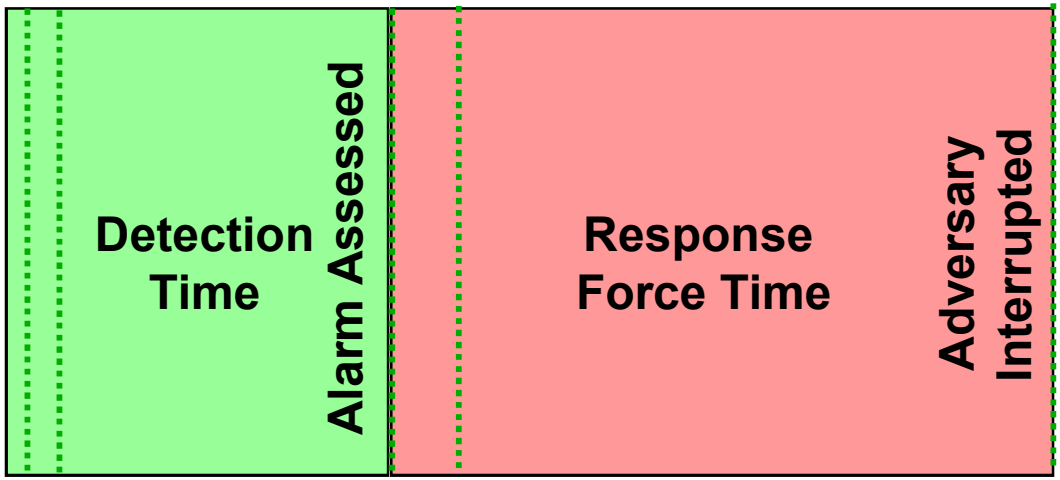
# Purpose of Alarm Assessment System

- Determine cause of sensor alarms
- Provide information about an intrusion (people, equipment) – for response force action
- Alarm assessment ends the Detection Timeline



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# Class Exercise 1: Detection Time

*Which step ends the Detection Timeline?*

1. Sensor alarm signal is generated
2. Alarm signal is transmitted to console
3. Alarm console operator is alerted by incoming alarm
4. Operator scans monitor image of the alarmed detection zone
5. In searching for cause of alarm, operator observes unauthorized person in that area
6. Operator calls up response force, identifying nature and location of intrusion
7. Response force interdicts intruder

# Assessment Methods

## Personnel or Technology

- Facility on-site personnel dispatched or on patrol
- Local law enforcement (police)
- Video assessment - camera display at alarm station

# Assessment by Guard Force On Site

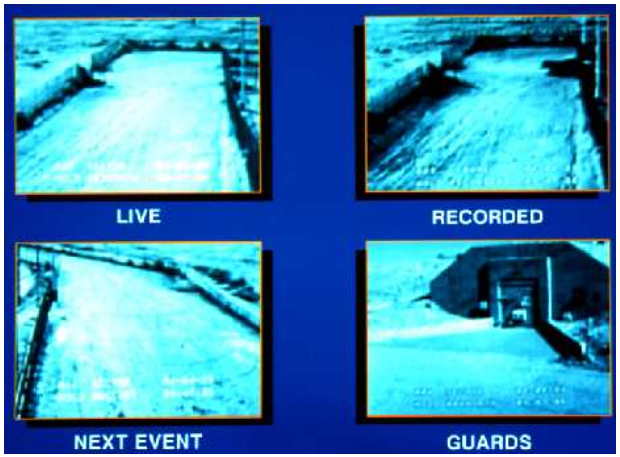
**Roving Patrols** **Fixed Patrol Stations**

# Alarm Assessment by Security Personnel

- **Advantages**
  - Can also provide detection capabilities
  - Flexible deployment
  - Can provide delay or immediate response
- **Disadvantages**
  - Significant time may have passed between an alarm and assessment
  - Can only tolerate small number of nuisance alarms
  - May require additional, expensive people

# Alarm Assessment by Video System

- Video cameras & lighting provide full coverage of sensored areas
- Thermal cameras provide full coverage of sensored areas without illumination
- Video is displayed on alarm console monitor for assessment
- Video assessment degraded by weather, blind spots, etc.





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# Alarm Assessment with Video System

- **Advantages**
  - Alarm assessment can occur almost immediately
  - Pre-event and post-event recorded video can be viewed
    - Enhance assessment capability
    - Recorded evidence
  - Efficient use of people
- **Disadvantages**
  - Requirement for video infrastructure
  - Initial expense may be high
  - Ongoing maintenance is necessary

# Video: Example of Blind spot

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# Video: Foggy Conditions

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# Video Assessment Systems Requirements

## A good video assessment system will have:

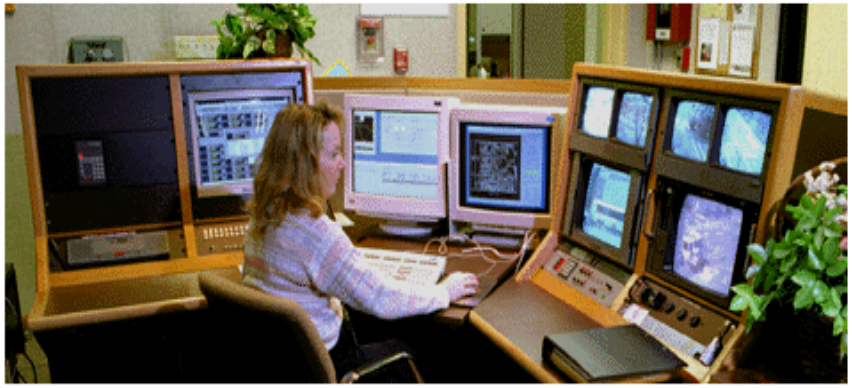
- **Short time between sensor alarm & video display (seconds)**
- **Complete area coverage of intrusion detection zone (camera views the entire area covered by sensor)**
- **Sufficient resolution at the far edge of the detection to be able to classify a 1 foot target**
- **Field of view 10 feet high at far edge of detection zone**

# Video Assessment Systems Requirements (cont.)

- Field of view at least 2 feet above tall exterior sensors
- Continuous operation 24 hours per day, 7 days per week
- Adequate illumination of the detection area at night
  or
- Use of thermal cameras at night
- Minimal sensitivity to adverse weather and environmental conditions

# Alarm Assessment vs. Video Surveillance

- **Assessment**
  - Use of video to immediately monitor a sensor-specific area when triggered by an alarm



- **Surveillance**
  - Continuous video monitoring of an area without an integrated sensor and alarm to alert attention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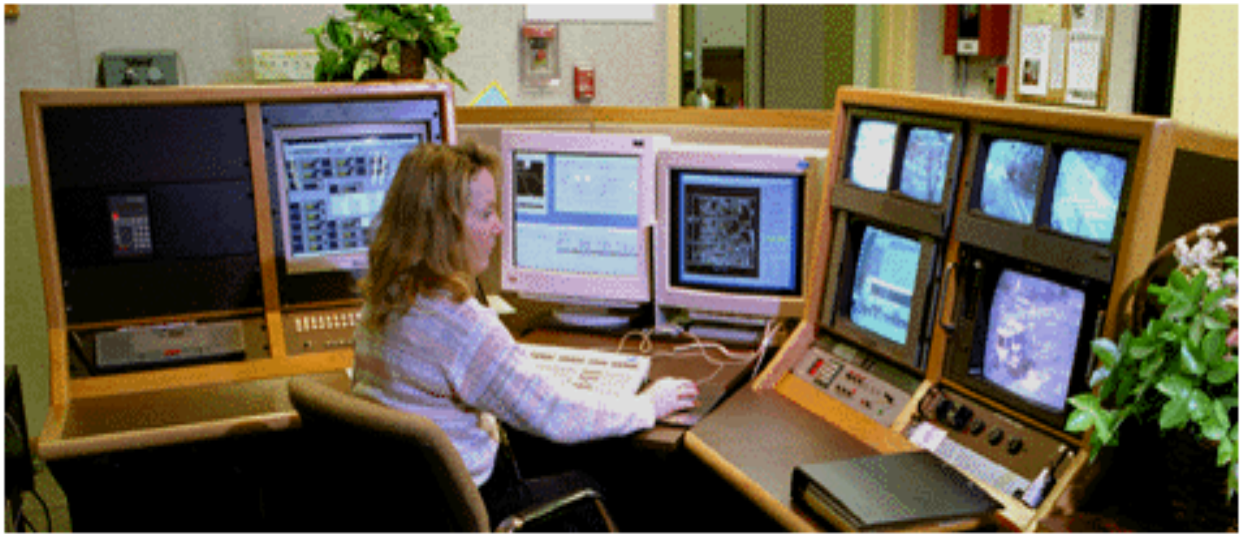
# Assessment vs. Surveillance

## Assessment definition

- Visual information to a human operator initiated by sensor activation so that the cause of alarm can be determined



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# Assessment vs. Surveillance (cont.)

## Surveillance definition

- Observation of an area by a human to determine if an intrusion or unusual event occurred. The observed area may not be sensored. Video recording can also be used capture evidence.

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# Assessment - Key Points

- Using technology, efficiency or accuracy of reporting events does not significantly change
- Technology can be a force multiplier
- Humans are alerted to alarmed events
- Proper application of multiple sensor and video assessment technologies can help the human make a quick and accurate decision in response to an alarm event

# Surveillance - Key Points

- Technology usually is visible to public and used as a deterrent
- Using a human as an intrusion detector has a low Probability of Detection ($P_D$)
  - Generally given a $P_D$ of 0.1 to 0.2
- Used when time is not critical to an event
- Loss of video leaves a single point failure in both the assessment and detection of the intrusion
- Surveillance often used as a secondary measure

# Class Exercise 2: Detection Time

*Question: Which Step ends Detection?*

1. Sensor alarm signal is generated
2. Alarm signal is transmitted to console
3. Operator is alerted by incoming alarm
4. Operator sends roving patrol to investigate because the video system is not functioning properly
5. The patrol radios the operator that they have arrived at the sensored area
6. After 1 minute, the operator sends another patrol to investigate why the first patrol has not responded

# Assessment Provides *Cause-of-Alarm* Information


**Detection, Classification, and Identification**

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# Overall Goal

**At the end of this series of alarm assessment modules, you will be able to**

- **Evaluate if an alarm assessment system is effectively installed and implemented**
- **Understand the use and limitations of surveillance**
- **Apply methods for performance testing an alarm assessment or surveillance system for adequacy**

# Summary

- Detection is not complete without assessment
- Humans make poor detectors but are good at assessment once alerted by electronic technology
- For an effective on-site response, the time between an alarm and assessment must be short

**Alarm + Assessment = Detection**