SECURITY SYSTEMS
& TECHNOLOGY
DETECT
DELAY
RESPOND

Real-World Examples: Federal and DoD Perimeter Protection

Basil J. Steele

Sandia National Laboratories

A Summit on Perimeter Security

American National Standards Institute
Homeland Security Standards Panel

May 17, 2005

What is a PIDAS?

P - Perimeter

I - Intrusion

D - Detection and

A - Assessment

S - System

PIDAS

- **A mutually supporting combination of barriers, clear zones, lighting, and electronic intrusion detection, assessment and access control systems constituting the perimeter of a Protected Area and designed to detect, impede, control or deny access to the Protected Area (PA).**

“Hard” PIDAS Requirements

- **PA will be protected by a system using Protective Forces, barriers, and intrusion detection**

“Soft” PIDAS Requirements

- Number of Sensors
- Sensor types
- Sensor layout

} Complimentary

- Zone width
- Lighting type
- Lighting placement
- Camera types
- Camera layout

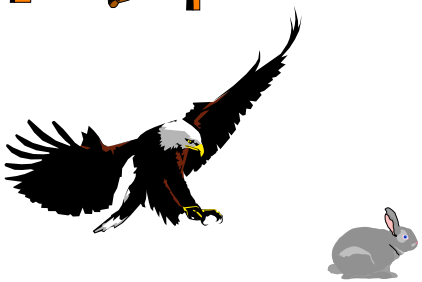
} Broad dynamic range, light limiting, 5 vertical scan lines

User's Performance Requirements

Requirement	Threat	R	N	Comments
Early Detection/Assessment of Ground-Bourne Threats	Unarmed Personnel		X	Do not want to detect unarmed personnel
	Personnel with Weapons	X		Can we discriminate between armed adversaries and workers with tools?
	Personnel with Explosives			
	Personnel with Radioactive Materials			
	"Light" vehicles			
	"Heavy" vehicles			
	Trojan Horse vehicles			
	Explosive vehicles			
Detection/Assessment of Ground-Bourne Threats	Unarmed Personnel			
	Personnel with Weapons			
	Personnel with Explosives			
…				

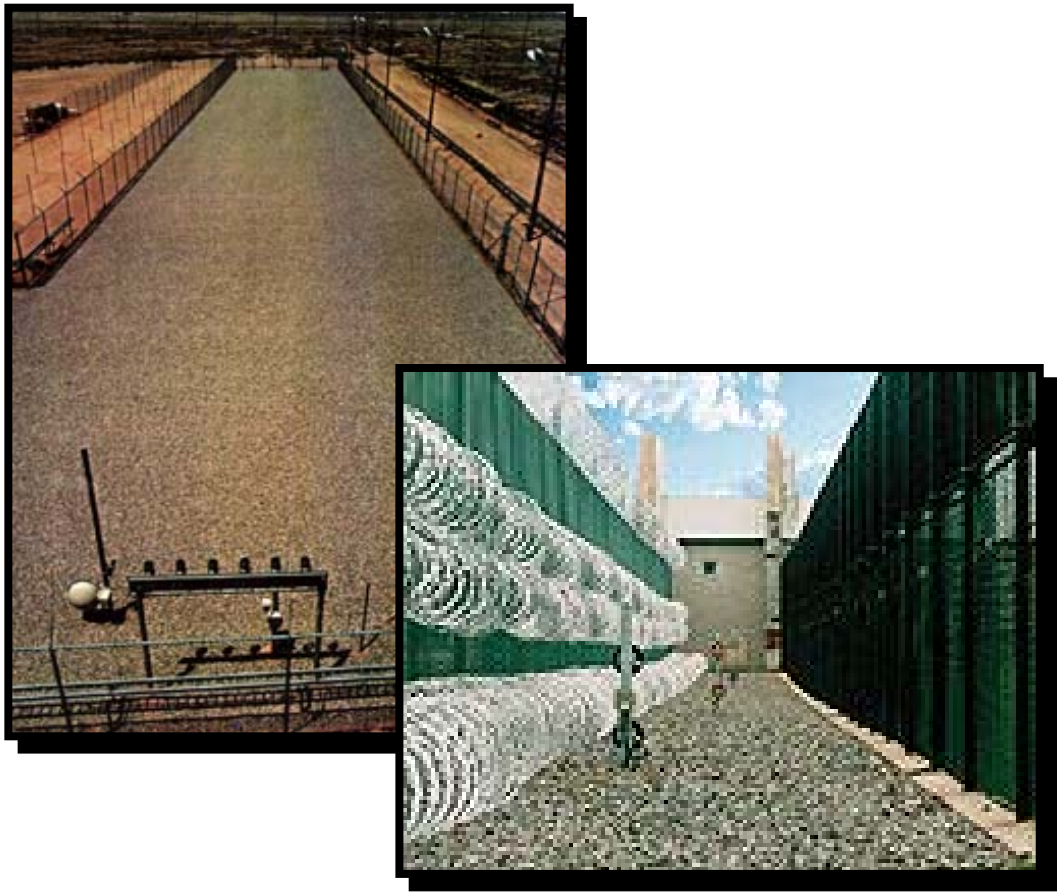
Performance

- **Sensor Characteristics**
  - **Probability of Detection, P_d**
  - **Nuisance Alarm Rate (NAR)**
  - **Vulnerability to Defeat**



Exterior Sensor Technologies

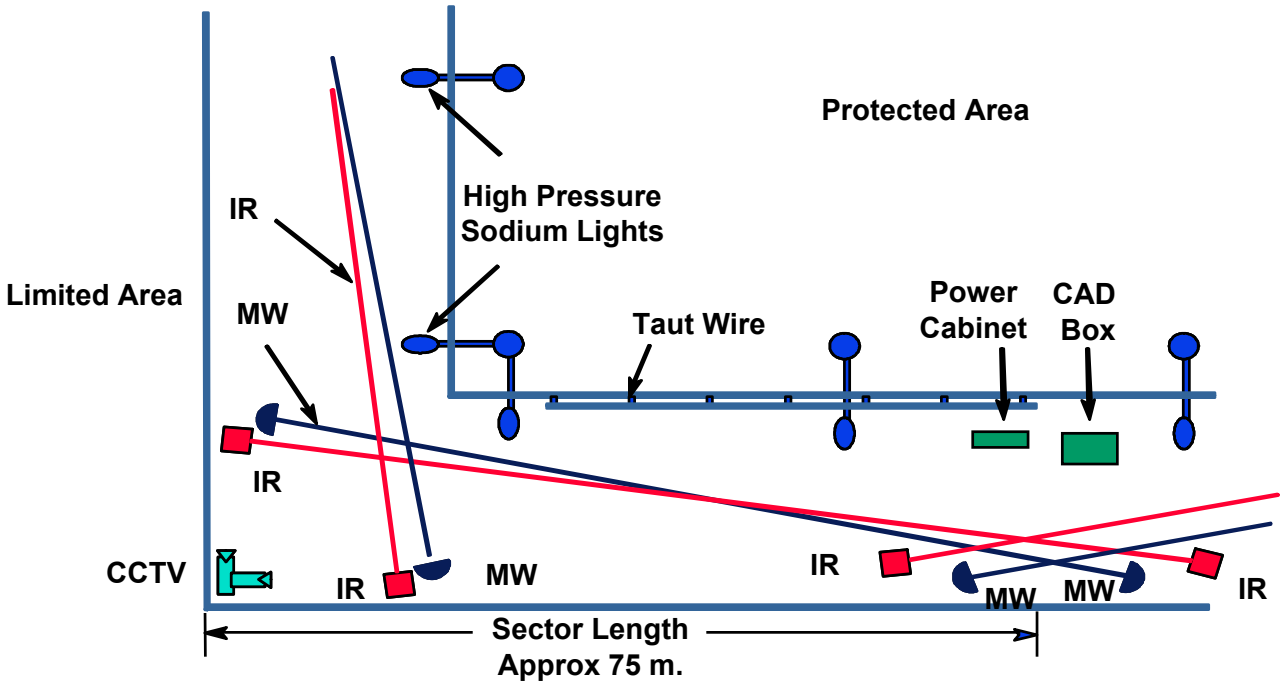
- Microwave
- Ultrasonic
- Active Infrared
- Passive Infrared
- Capacitance
- Sonic
- Vibration
- Fiber Optics
- Video Motion Detectors

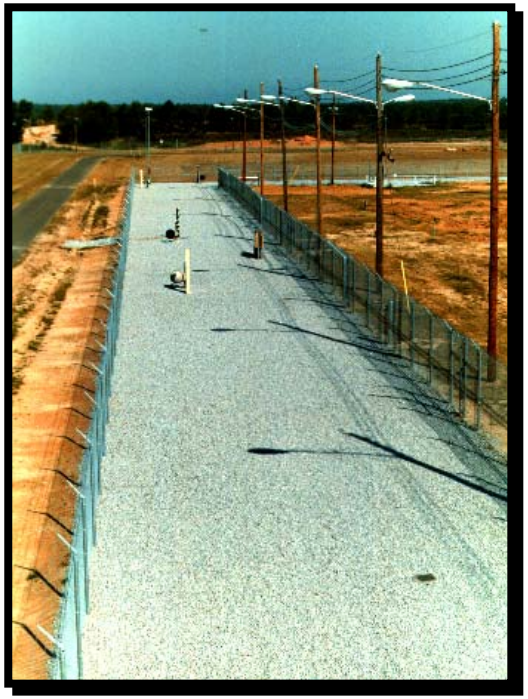


Features of a Good Barrier System

- Provides delay after detection
- Exhibits balanced design; no weak links
- Uses delay-in-depth
- Designed for maximum credible threat

Schematic of Typical System





Soft Requirements

Sensor types

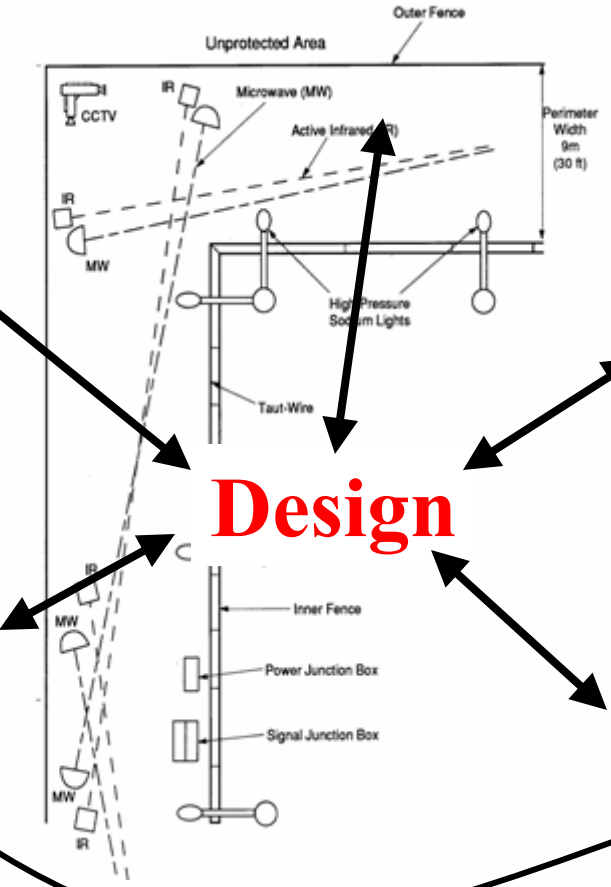
Sensor layout

Lighting layout

Design

Topography

Camera layout



Exterior CBRN Detection Technologies

- Chemical
- Biological
- Radiation
- Medical Surveillance
- Intrusion Detection
- Etc.

Early Warning Detection

LaserGuard

AES

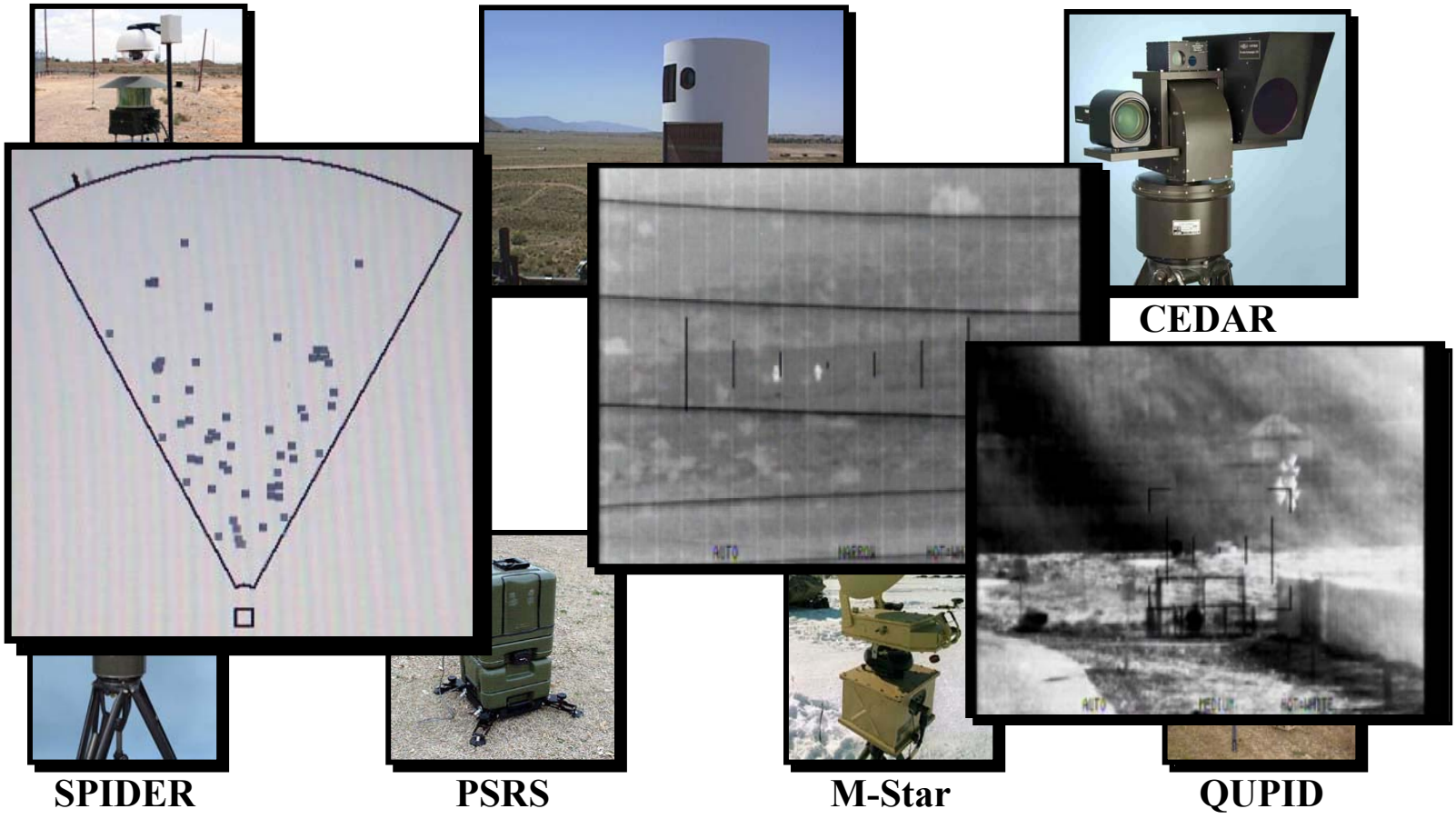
CEDAR

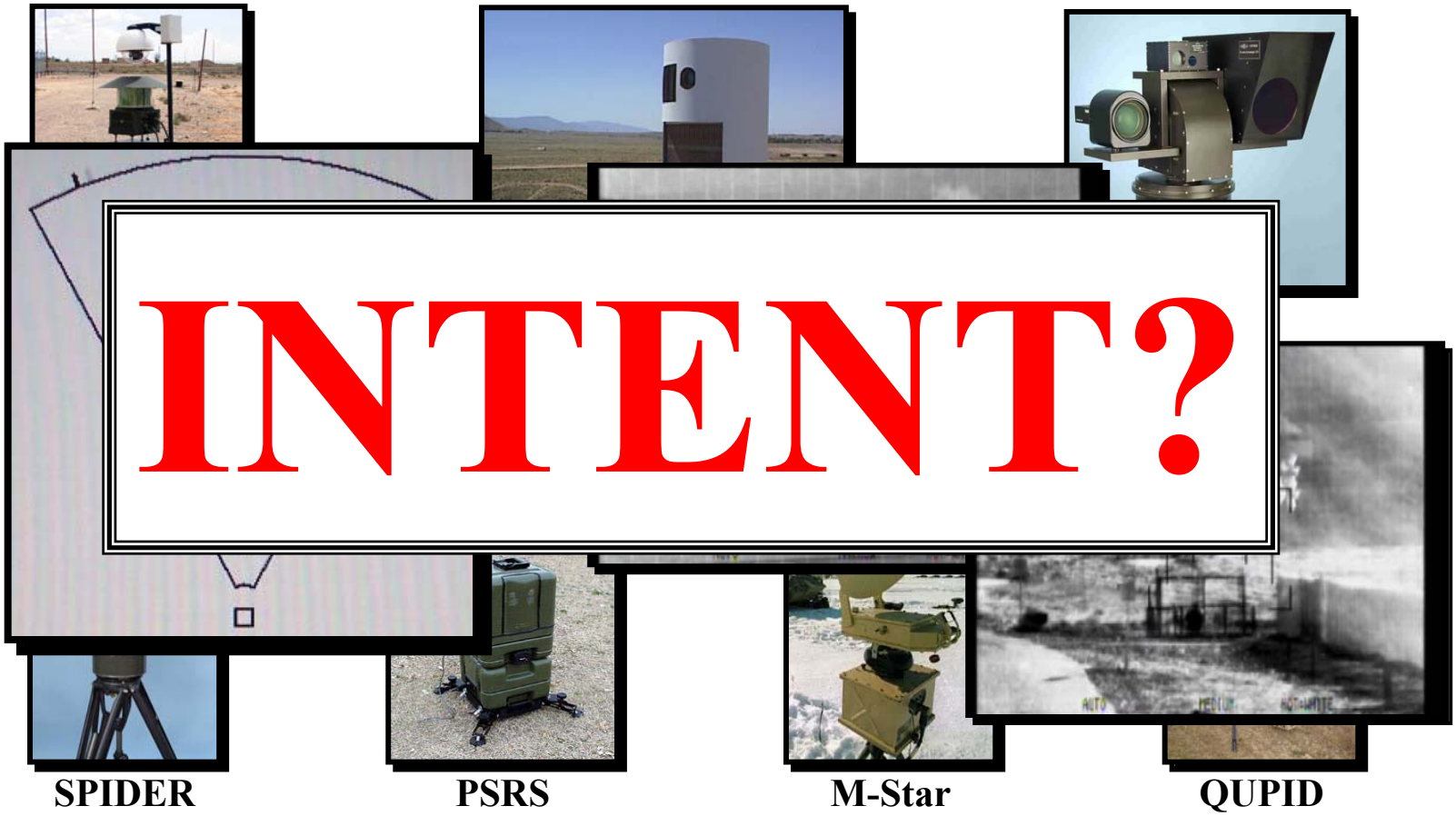
SPIDER

PSRS

M-Star

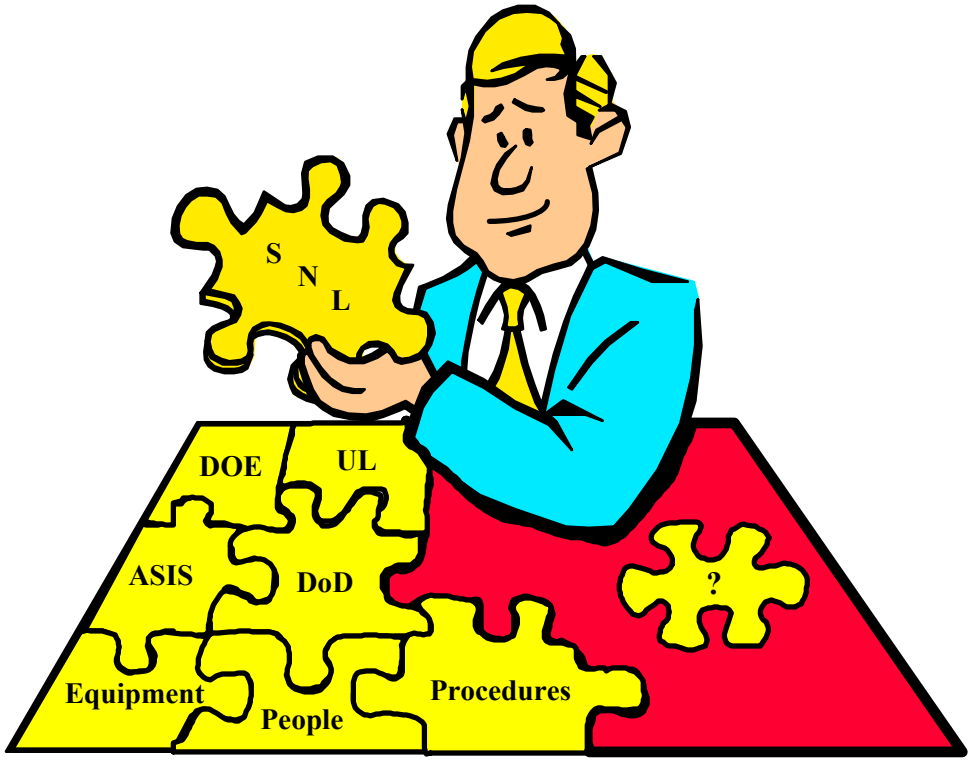
QUPID


CEDAR
SPIDER
PSRS
M-Star
QUPID


INTENT?
SPIDER
PSRS
M-Star
QUPID

Summary

- **Questions and Answers**

Basil J. Steele
(505) 845-3620
bjsteel@sandia.gov

MS 0768
Sandia National Laboratories
P.O. Box 5800
Albuquerque, NM 87185-0768