Modern Security Electronics: Design Must Match Operations And Ideally Maintenance Capabilities

CMI Conference 2019
EACH FACILITY IS A CUSTOM INSTALLATION AND PROGRAM

This is a 10,000 foot review
FUNDAMENTAL DOOR CONTROL FUNCTIONS

• Safety of all occupants
• Emergency Release if 10 or more locks in egress
  • Remotely unlock all doors in an area in 60 seconds with minimum staff
  • Hold back all bolts so that doors do not relock when closed.
• Accidental activation is an issue
  • “Are you sure” screen.
  • Two remote buttons simultaneously
• Emergency Power is required
LOCKING SYSTEMS

- Solenoid lock for swing doors
  - Apply power continuously to unlocked
- Motorized Lock for swing doors
  - Half cycle lock to retract bolt and unlock
  - Complete cycle to allow door to relock when closed
- Motorized Sliding Device
  - Fully operable – Open, Close, Stop
  - Kick release – manual open and close after unlocking
DOOR FUNCTION

• Unlock circulation doors remotely
• Cell group release for large scale movement
  • Block group release for restrictions
• Interlock sallyport doors
  • Interlock override in an emergency
• Monitor that door is secured or not secured
• Detect door open too long (propped)
• All doors are required to have key or local mechanical release as last resort
• Relay Logic
  • Timer relays for delays
  • Diode matrix for logic
• Proprietary Controllers
• Industrial Programmable Logic Controllers
  • Programming replaces timer relays and diodes
USER INTERFACE

- Switch and Lamps – no graphic
- Graphic panels with switches and lamps
- Computer Control Station
- Touchscreen Control Station
- PDA – Portable Digital Assistant
CAMERA and VIDEO

- Analog
  - Proprietary
  - Central Processing
  - Coax
  - Limited Resolution
  - Manufacturer’s DVR

- Internet Protocol (IP)
  - Open – standards based
  - Distributed Processing
  - Ethernet Infrastructure
  - Megapixel resolution
  - IT storage media options
VIDEO ANALYTICS

• Analog
  • Central Processing
  • Massive CPU
  • Slow response

• Internet Protocol (IP)
  • At the edge
  • Distributed Processing
  • Perimeter Line Crossing
• Operator Interfaces
• Programmable Logic Controllers
• Intercom systems
• Video Systems
SYSTEM AUTOMATION

- Selecting Intercom at door calls up camera to spot monitor
- Selecting duress alarm calls up camera to spot monitor
- Interlock group prevents two doors in sallyport being opened at the same time
- Opening a pedestrian gate in perimeter fence automatically bypasses perimeter alarm
- Perimeter alarm calls up cameras covering zone
- PC records all actions and alarms for forensics
SYSTEM FLEXIBILITY

• Shutting down a direct supervision station rolls control up to the next level. Next level must give control back to local station.

• Multiple stations in Central/Master Control allow multiple stations to control different areas during periods of high activity, or a single station during low activity.
REASONS FOR SYSTEM RETROFIT

• Existing Components may be outdated
• Difficult to get replacement parts
• Operational issues
• Mission Changes
• Code issues
SYSTEM RETROFIT

• Survey existing facility
  • Assessment of existing systems
  • Document existing equipment locations
  • Document existing control functions
• Develop recommendations
  • Replacement Priority
• Develop construction schedule
• Probable cost projection
SYSTEM RETROFIT SCOPE

• What should be included?
  • Replace Control panels with Touchscreen
  • Replace PLC with latest model
  • Replace Relays
  • Replace Cameras
  • Replace UPS
  • Replace Intercoms
  • Replace wiring if damaged
  • Replace Locks
• Stuxnet virus attacked PLC’s
• Risk is an “All On”, or “All Off”
• Air-gapped network
  • Physically separated from other networks
  • Requires least labor for security
• Video has benefits when shared
  • Connecting video exposes all connected systems.
• Connected networks require more staff hours
• BBQ Drawing at 2:30 pm at R&N’s booth 103