

Global
Material
Security



Applications of Emerging Technologies in Transport Security of Radioactive Material SARTSS

Office of Global Material Security

U.S. Department of Energy
National Nuclear Security
Administration

Presentation Overview



- Transport security
- Emerging technologies in nuclear security
- Drone uses and threats in transport security
- Looking ahead

Introduction—What is Transport Security?



- Transport security is protection of nuclear and radioactive material while in transit
- Crucial aspect to ensure material properly arrives to destination
- Radioactive material is most vulnerable when mobile

Introduction—What is Emerging Technology?



- Something which can have significant impact in area of interest within short timespan
- New technology/methodology
- Improvements on previous technology/methodology



- Cyber
- Modeling, simulations
- Unmanned aerial systems (drones)

Drone Discussion



Commercial Drone Use 1



Commercial Drone Use 2



Emerging Technologies in Nuclear Security- Drones



- Small unmanned aerial systems (drones) developing more prominent roles in nuclear security
- Increased capabilities
- Increased availability



Drones in Transport Security



- Adds aerial dimension to security
- Offers additional advantages to bolster security
 - Remote monitoring
- New adversary threats during transport constantly developing
 - Drones provide additional tool for attacks

Proactive Use of Drones in Transport Security–Route Monitoring



- Wider view of surrounding area
 - Check for suspicious activity along or around route
- Provide visual communication for material location



Proactive Use of Drones in Transport Security–Material Inspections



- Constant view of material while in transit
 - Can also provide constant view of escort vehicles
- Adds security during breaks or emergency stops

Drone Threats in Transport Security— Surveillance



- Drones can be used by adversaries to follow route during transport
 - Can use this info to time ambush on shipment
 - Use info to monitor accompanying vehicles, personnel
- Can look for patterns during repeat transports from site

Drone Threats in Transport Security-Payloads



- Attach small explosive devices to drones to disable vehicles
- Cause distraction, disrupt operations
 - Give adversaries window of opportunity to approach on foot
- Direct collision with vehicles

Drone Threats in Transport Security— Material Retrieval



- Drones can be used to quickly retrieve material during security incident during transport
 - Ground forces obtain material and remotely use drone to quickly move material away from scene



Drone Threats in Transport Security-Swarming



- Unleash multiple drones in coordinated attack to meet objective
- Autonomously share information
- Drones may play different roles in swarm attack



- Optimize drone use during transport
 - Quantity of drones used
 - Battery life consideration while in operation
- Develop new methods for drone use in transport security
 - Communication improvement
 - Counter adversary drones



- Drone mitigation
 - Develop protocols early to prevent significant adversary impact
 - Assess and neutralize potential adversary drones





Questions?

