

DRONES AND CRITICAL INFRASTRUCTURE

SB 992

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Overview

When it comes to drone use near critical infrastructure, the issue has—much like the drones themselves—largely flown under the radar.

It is increasingly coming to the attention of state policymakers, however, who are attempting to strike a balance between public safety and commercial use. Energy companies are interested in using drones to survey far-flung equipment, but concerns exist over how drones could be used in attacks against these facilities.

Fourteen bills addressing drone use near critical infrastructure have been introduced in nine states so far in 2016. That's more than the total of drone-related bills introduced over the previous three years.

In all, nine states have enacted 12 laws pertaining to drone use near critical infrastructure: Arizona, Arkansas, Louisiana, Nevada, Oklahoma, Oregon, Tennessee, Texas and Wisconsin. Similar legislation has also been introduced in six other states: California, Georgia, Hawaii, Mississippi, New Jersey and Pennsylvania.

Federal Action

In June 2016, the Federal Aviation Administration (FAA) announced a set of regulations for the commercial use of small Unmanned Aircraft Systems (UAS), which will take effect on Aug. 29, 2016. The new rules prohibit the operation of a drone over any people not directly involved in the operation, prohibit nighttime use and prohibit attaching any hazardous materials to a drone. However, they do not specifically address critical infrastructure and facilities—aside from airports. More information on these regulations can be found here.

Shortly after the FAA released its regulations, Congress approved a 17-month extension of the FAA. The extension included a number of provisions regarding UAS and critical infrastructure, specifically sections 2209 and 2210. Section 2209 requires FAA, by the end of 2016, to establish a process for applicants to petition the FAA to prohibit or restrict the operation of an unmanned aircraft in close proximity to a fixed site facility. The section specifically lists critical energy infrastructure, oil refineries, chemical facilities and amusement parks.

Section 2210 tasks the FAA with establishing a process that allows a person to apply to the FAA for an exemption from certain aspects of its small commercial UAS rule if the operation of the UAS specifically pertains to critical infrastructure. Such exemptions might be for line-of-sight or nighttime operations. The section also includes language as to what may be considered a critical infrastructure facility.

NCSL recently released a wide-ranging report that looks at UAS policy across the nation: “Taking Off: State Unmanned Aircraft Systems Policies.”

While Congress has directed the FAA to establish some rules for drone use around critical infrastructure, it is likely that in the coming years the matter will be further fleshed out alongside other UAS-related policies as state and federal governments grapple with how to manage the ever-increasing number of vehicles traversing our nation's skies.

Safety, Economy and Efficiency

The debate revolves largely around issues of security. While there are obvious commercial applications for UAS in the monitoring and maintenance of critical infrastructure, there are also concerns about the dangers that could come with unrestricted use of drones near these facilities.

On the one hand, UAS allow for the prompt, safe and efficient inspection of critical infrastructure—from the electric power system, to the oil and gas sector, to transportation and telecommunications. Drones are already used across the energy sector because of their potential for increased efficiency, cost reductions and worker safety. They can also prove beneficial in the aftermath of extreme weather events, allowing for a widespread and efficient survey of systems and equipment that may be difficult to access.

Utilities, like Xcel Energy, have received FAA license exemptions for line-of-sight operations in order to inspect thousands of miles of transmission lines. These lines can often be difficult to reach, with access previously limited to helicopters, which cost companies significantly more. Pipeline operators face similar physical obstacles to inspecting their systems, and given that drones can be outfitted with lidar, infrared and other visual imaging devices, they can help companies to detect methane leaks or other issues.

Drones also have been used to assist in power plant inspections. Using a drone to inspect a boiler or cooling tower has the potential to reduce down time, save money and avoid the safety hazards associated with sending workers in to perform these inspections.

Similarly, drones can help with the efficient and precise inspection of renewable generation, like wind turbines, which are often spread out over wide territories. Wind turbine blades require regular inspection and companies would often send workers out inspect the equipment with binoculars or, if more intensive inspection was necessary, by climbing the turbines. This work was costly and put workers at unnecessary risk. Drones can allow operators to these perform up-close inspections in a much more efficient and safe manner. Solar PV operators have started to use drones to inspect larger facilities, as well.

In all of these cases, UAS technology has enabled energy companies to take operations and maintenance work that was previously costly, time-consuming and sometimes risky, and reduce all of these negative factors substantially.

Security Concerns

On the other hand, UAS can pose a potential danger to critical infrastructure and, therefore, public safety. The FAA has reported a substantial rise in the number of pilots reporting close-calls with drones near airports. Meanwhile, concerns over more sinister uses also linger. Security experts have warned that drones could be used by terrorists to surveil or assist in carrying out an attack on critical infrastructure and critical facilities.

In December 2014, France revealed that unauthorized and unidentified UAS had breached the restricted airspace over 13 of the country's 19 nuclear plants during the preceding three months. These UAS were described as highly sophisticated civilian devices, and the flights over nuclear facilities appeared to be coordinated, with most of the violations occurring at night. In light of the increasing security concerns in Europe following terrorist attacks in France and Belgium, there is concern over the possible motives.

By no means is Europe alone. There have been many notable incidents in the United States. In early July 2016, the U.S. Department of Energy revealed that its Savannah River Site—which processes and stores nuclear materials—had experienced eight unauthorized flyovers in the span of two weeks. There have been unauthorized flyovers of a U.S. Navy nuclear submarine base, major sporting events, large public gatherings and national monuments. UAS have crashed into the White House lawn and the New York Capitol, and there has been widespread documentation that they are being used to deliver contraband to prisons.

Most traditional radar cannot detect small, low-flying UAS, so this trend is particularly troubling. The majority of these documented flyovers were only discovered because of human detection—often by vigilant security personnel with keen eyesight. There have been efforts to improve upon the available technology, and a number of companies are marketing drone-detection security systems. However, even when they are detected, there are complications intercepting them and identifying the operators.

So far, drones have not played a documented role in any catastrophic incidents, but there are those who feel the technology could be used in any of the following capacities:

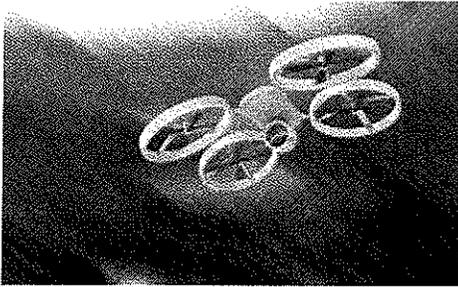
- Reconnaissance missions of critical facilities by hostile groups to gather intelligence on site layout, guard movement, or other information that could help in carrying out a physical attack.
- Dropping explosives intended to damage critical or sensitive infrastructure, or in transportation hubs and other areas of public gathering.
- Delivery of weapons or other materials for use in an attack.
- Providing air support to a ground attack.

State Legislatures Strike a Balance

Current state-level action is often an attempt to balance these safety concerns with the inherent utility and commercial applicability of these devices. While barring UAS operation around certain facilities, these statutes often provide exemptions—usually for law enforcement agencies, owners and operators of facilities, and those with the written consent of owners and operators.

In some cases, UAS are restricted from going within a certain distance of a facility's perimeter. In Tennessee, for instance, UAS are prohibited from going within 250 feet of a facility's external perimeter, regardless of the height. Other states—like

Oklahoma, Oregon and Texas—have made it illegal to operate a UAS above critical facilities at a height of less than 400 feet above the ground. This creates a column of restricted airspace above facilities that ends 400 feet above the ground. However, given that FAA rules generally prohibit UAS operation above 400 feet, the combination creates a de facto no-fly zone over these facilities.



Section 2210 of the FAA extension offers some indication on how the federal government plans to define critical infrastructure in these circumstances—making note specifically of pipelines, the electric grid, and oil and gas facilities.

States often vary, however, in how they define critical infrastructure. Oklahoma, Oregon and Texas have some of the broadest—most inclusive—definitions. Their statutes outline more than a dozen types of infrastructure and facilities, including various types of refineries and power plants; certain components of electric grid; chemical, steelmaking and other manufacturing plants; many aspects of the natural gas processing and distribution system; freight shipment hubs, like rail yards and ports; various components of oil and chemical pipelines; telecommunications infrastructure, such as cell phone towers and broadcast facilities; along with state- and federally-regulated dams.

Other states have defined critical infrastructure more narrowly. Tennessee, for instance, defines critical infrastructure as one of the following five types of facilities: electric power plants, petroleum refineries, manufacturing facilities that use combustible chemicals, facilities that manufacture chemicals or rubber, and petroleum or chemical storage facilities.

There has also been an increase in the inclusion of correctional facilities in these definitions—or in standalone statutes that specifically identify correctional facilities. During the 2016 legislative session in Mississippi, two bills failed that would have prohibited the operation of drones near correctional facilities.

Enacted Legislation

A number of states have also passed legislation or enacted regulations restricting drone operation within their state capitol complexes. These include: Arkansas, Georgia, Michigan, Texas and Washington.

State	Bil No.	Summary
Arizona	SB 1449 - (enacted May 11, 2016)	Prohibits certain operations of UAS, including operation in violation of FAA regulations and operation that interferes with first responders. The law prohibits operating near, or using UAS to take images of, a critical facility.
Delaware	HB 195 - (enacted Sept. 6, 2016)	Creates the crime of unlawful use of an UAS and prohibits operation over any event with more than 1500 attendees, over critical infrastructure and over an incident where first responders are actively engaged in response or transport.
Oklahoma	HB 2599 - (enacted May 18, 2016)	Prohibits operation of UAS over certain critical facilities any less than 400 feet above ground level, unless otherwise authorized to do so.
Oregon	HB 4066 - enacted March 29, 2016)	Prohibits and restricts operation of UAS in several areas, including critical infrastructure any less than 400 feet above ground level, unless otherwise authorized to do so. It also makes it a class A misdemeanor to operate a weaponized UAS.

Tennessee	SB 2106 - (enacted April 12, 2016)	Restricts operation of UAS within 250 feet of a critical facility's perimeter, making it a crime to do this for the purpose of conducting surveillance or gathering information about the facility, though commercial applications in compliance with FAA standards are exempted.
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State	Bill No.	Summary
Arkansas	HB 1770 - (enacted April 2, 2015)	Restricts the operation of UAS to conduct surveillance or electronically record or collect information about certain critical infrastructure without consent.
Nevada	AB 239 - (enacted June 2, 2015)	Regulates the operation of UAS, prohibits the weaponization of UAS, and prohibits operation of UAS near certain critical facilities and airports without permission.
Tennessee	HB 153 - (enacted April 20, 2015)	Prohibits the operation of UAS, without the venue owner or operator's consent, at an event venue where more than 100 people are gathered for a ticketed event, while also prohibiting use near a correctional facility.
Texas	HB 1481 - (enacted June 19, 2015)	Prohibits the operation of UAS over certain critical infrastructure facilities if it is nor more than 400 feet above the ground, and makes it a class B misdemeanor to do so.
Texas	HB 3628 - (enacted May 28, 2015)	Permits the Texas Department of Public Safety to adopt rules governing the operation of UAS in the state Capitol Complex, and makes it a class B misdemeanor to violate those rules.

State	Bill No.	Summary
Louisiana	HB 1029 - (enacted June 18, 2014)	Creates the crime of unlawful use of an unmanned aircraft system. The law defines the unlawful use of an unmanned aircraft system as the intentional use of a UAS to conduct surveillance of a targeted facility without the owner's prior written consent. The crime is punishable by a fine of up to \$500 and imprisonment for six months. A second offense can be punished by a fine up to \$1,000 and one year imprisonment.
Tennessee	SB 1892 - (enacted May 1, 2014)	Identifies 18 lawful uses of UAS, including the commercial use of UAS in oil pipeline and well safety.

State	Bill No.	Summary
Texas	HB 912 - (enacted June 14, 2013)	Outlines 19 lawful uses for UAS, including their use in oil pipeline safety and rig protection.

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AN INDIVIDUAL WHO IS OPERATING AN UNMANNED AERIAL VEHICLE SHALL NOT:

- KNOWINGLY OPERATE THE UNMANNED AERIAL VEHICLE IN A MANNER THAT INTERFERES WITH THE OPERATIONS OF A PUBLIC UTILITY, KEY FACILITY, CORRECTIONAL FACILITY, OR PUBLIC TRANSPORTATION SERVICE.

DEFINITIONS:

- "PUBLIC UTILITY" MEANS THAT TERM AS DEFINED IN SECTION 1 OF 1972 PA 299, MCL 460.111, BUT INCLUDING A MUNICIPALLY OWNED UTILITY.
- "KEY FACILITY" MEANS THAT TERM AS DEFINED IN SECTION 552C OF THE MICHIGAN PENAL CODE, 1931 PA 328, MCL 750.552C.
- "CORRECTIONAL FACILITY" MEANS A STATE CORRECTIONAL FACILITY OR A JAIL AS THOSE TERMS ARE DEFINED IN SECTION 62 OF THE CORRECTIONS CODE OF 1953, 1953 PA 232, MCL 791.262, OR A FACILITY OR INSTITUTION THAT IS MAINTAINED AND OPERATED BY A PRIVATE CONTRACTOR UNDER SECTION 20I OF THE CORRECTIONS CODE OF 1953, 1953 PA 232, MCL 791.220I.
- "PUBLIC TRANSPORTATION SERVICE" MEANS THAT TERM AS DEFINED IN SECTION 10C OF 1951 PA 51, MCL 247.660C.

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PHYSICS DEPARTMENT

PHYSICS 354

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