

**AIRPORT COOPERATIVE RESEARCH PROGRAM**

**ACRP REPORT 108**

**Guidebook for Energy  
Facilities Compatibility  
with Airports and Airspace**

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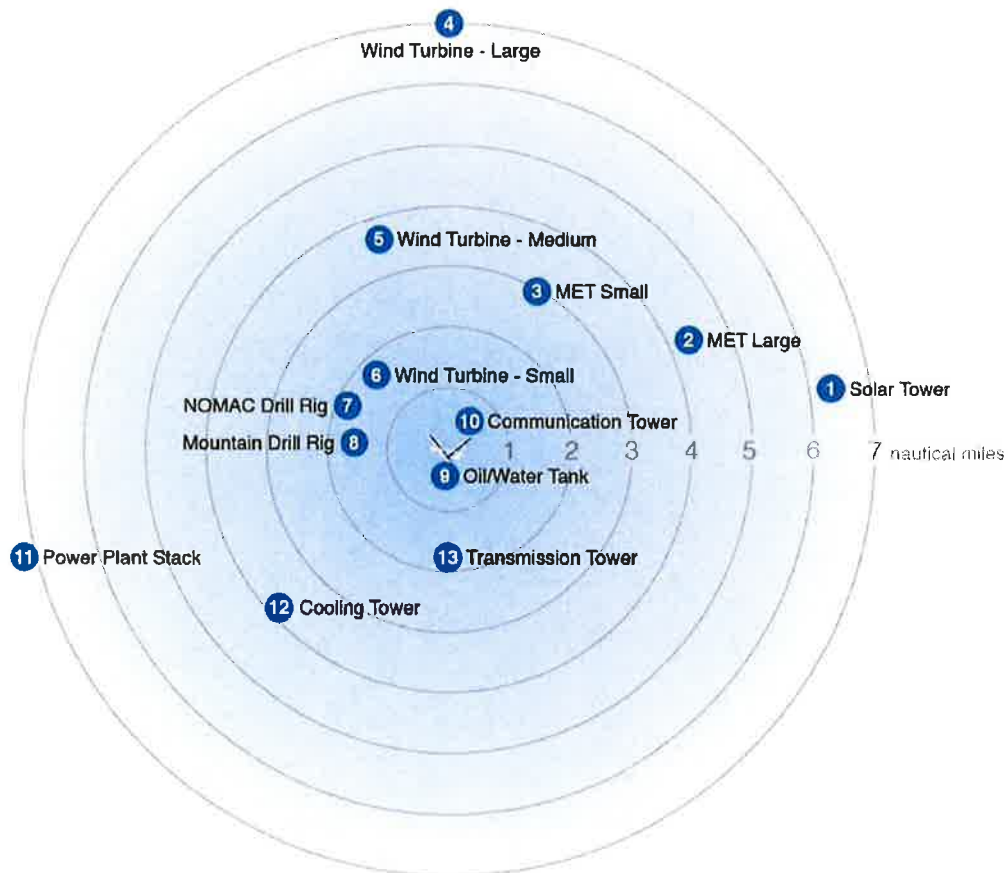
[www.TRB.org](http://www.TRB.org)

**Table 4.6. Siting guidance.**

SITING GUIDANCE				
Structure	Height (ft. AGL)	Representative Structure	Distance Guideline (NM) <sup>1</sup>	Basis <sup>2</sup>
Solar Tower	540	Crescent Dunes (Tonopah) Concentrating Solar Power Project <sup>3</sup>	6.4	FAR 77.23
Solar Panel	10	Typical	0.02	FAR 77.25
Meteorological Tower – Tall	330	Typical for 100 meter hub height	4.3	FAR 77.23
Meteorological Tower – Small	199	Typical	3	FAR 77.25
Wind Turbine – Tall	600	GE 2.5MW 120 meter hub height	7	FAR 77.23
Wind Turbine – Medium <sup>4</sup>	265	GE 1 MW Wind Turbine	3.6	FAR 77.23
Wind Turbine – Small <sup>5</sup>	155	Northern Power Systems 100 kW Wind Turbine	1.8	FAR 77.25
Drill Rig 1 – NoMAC	173	DFW	1.9	FAR 77.25
Drill Rig 2 – Mountain Rig	103	DFW	1.6	FAR 77.25
Oil / Water Tank	21	DFW	0.2	FAR 77.25
Communication Tower	70	DFW	0.6	FAR 77.25
Power Plant Stack	630	Turk Coal Plant, AR <sup>6</sup>	7.3	FAR 77.23
Cooling Tower	370	Fort Martin Power Plant, WV	4.7	FAR 77.23
Transmission Tower	150	Northern Pass Transmission Project	1.8	FAR 77.25
Drill Rig 2 – Mountain Rig	103	DFW	1.6	FAR 77.25

Notes:

1. Base point for distance measurement is assumed to be closest runway threshold at the airport.
2. FAR Part 77, "Objections Affecting Navigable Airspace."
3. Under construction; expected to be commissioned in late 2013.
4. Wind turbine sizes from DOE NREL: [http://www.nrel.gov/wind/midsize\\_wind.html](http://www.nrel.gov/wind/midsize_wind.html).
5. <http://www.nrel.gov/wind/smallwind/>.
6. Commissioned in December 2012.



**Figure 4.1. General guidance for siting distance for typical energy structures.**



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#### General Resources

#### Obstruction Standards

- [FAR Part 77.23](#)
- [FAR Part 77.23\(a\)\(2\)](#)
- [FAR Part 77.25](#)

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## FAR 77.23 Standards for Determining Obstructions

### Criteria:

(A) An existing object, including a mobile object, is, and a future object would be, an obstruction to air navigation if it is of greater height than any of the following heights or surfaces:

(1) A height of 500 feet above ground level at the site of the object.

(2) A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 500 feet.

(3) A height within a terminal obstacle clearance area, (Terps<sup>®</sup>) including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.

(4) A height within an en route obstacle clearance area, including turn and termination areas, of a Federal airway or approved off-airway route, that would increase the minimum obstacle clearance altitude.

(5) The surface of a takeoff and landing area of an airport or any imaginary surface established under [FAR Part 77.25](#), 77.28, or 77.29. However, no part of the take-off or landing area itself will be considered an obstruction.

### Additional height penalty for traverse ways

B) Except for traverse ways on or near an airport with an operative ground traffic control service, furnished by an air traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (A) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:

(1) Seventeen feet for an Interstate Highway

That is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.

(2) Fifteen feet for any other public roadway

(3) Ten feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.

(4) Twenty-three feet for a railroad, and,



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- FAR Part 77.23
FAR Part 77.23(a)(2)
FAR Part 77.25

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FAR 77.23(a)(2), Obstruction Standards

Criteria:

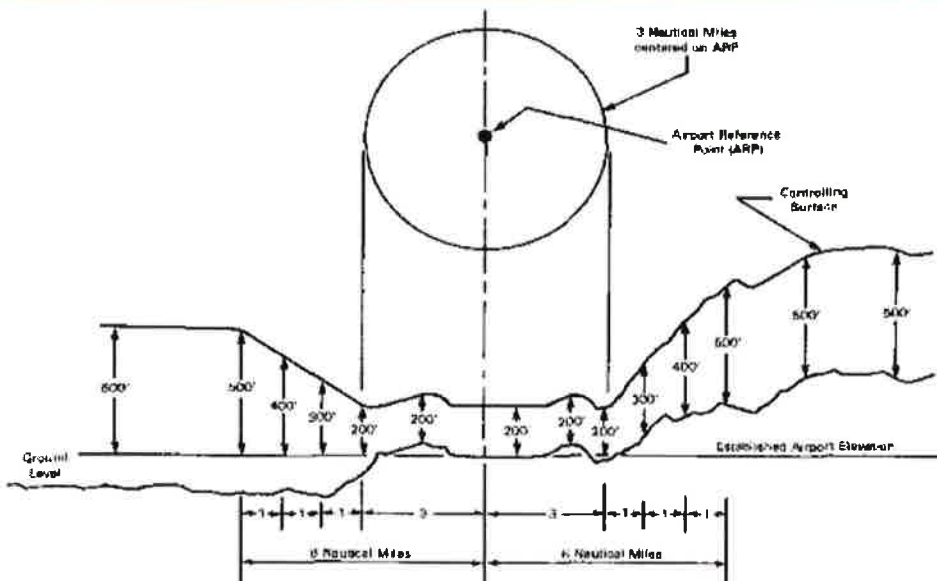
An object would be an obstruction to air navigation if the object has a height greater than 200 feet above ground at the site, or above the established airport elevation, which ever is higher

(a) within 3 nautical miles of the established reference point of an airport with its longest runway more than 3,200 feet in actual length, and

(b) that height increases in proportion of 100 feet for each additional nautical miles from the airport reference point up to a maximum of a 500 feet.

Please Note: heliports are excluded

Diagram



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Ways to avoid surface penetration

If your structure penetrates allowable height for surfaced analyzed, you can do the following to prevent a penetration:

- (1) Lower the height of your structure
(2) Move the structure further away from airport
(3) Use Airspace OMS software to determine new location that is ideal for your needs.