



National Transportation Safety Board

Washington, DC 20594

Safety Recommendation

Date: May 15, 2013

In reply refer to: A-13-21

46 US states, 4 territories and DC
(See attached distribution list)

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. The NTSB determines the probable cause of the accidents and issues safety recommendations aimed at preventing future accidents. In addition, the NTSB carries out special studies concerning transportation safety and coordinates the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters. We are providing the following information to urge you to take action on the safety recommendation issued in this letter.

This recommendation addresses the need to mitigate risks to low-altitude aviation operations by requiring that meteorological evaluation towers (MET)¹ be marked and registered in a directory. It is derived from the NTSB's investigations of three accidents in which airplanes inadvertently collided with METs, fatally injuring four people. As a result of these investigations, the NTSB has issued six safety recommendations, one of which is addressed to [state or territory]. Information supporting this recommendation is discussed below.

Accidents

On January 10, 2011, about 1057 Pacific standard time, the left wing of a Rockwell International S-2R, N4977X, impacted an unmarked and unlighted MET during an aerial seed application flight on Webb Tract Island, Oakley, California.² Witnesses reported that they did not see the airplane perform any evasive maneuvers before the impact, indicating that the pilot did not see the obstruction. The pilot was fatally injured, and the airplane sustained substantial damage. Visual meteorological conditions prevailed and no flight plan was filed for the 14 *Code*

¹ METs are temporary structures used to measure wind speed and direction during the development of wind energy conversion facilities. METs are made from galvanized tubing (or other galvanized structure) with a diameter of 6 to 8 inches and are secured with guy wires that connect at multiple heights on the MET and anchor on the ground.

² More information about this accident, NTSB case number WPR11LA094, is available at <http://www.nts.gov/aviationquery/index.aspx>.

of *Federal Regulations* (CFR) Part 137 flight. The NTSB's investigation found that the county permit³ for the MET had expired more than a year before the accident, but the MET had not been removed as stipulated by the permit's conditions of approval.

On May 19, 2005, about 0944 central daylight time, a turbine-powered Air Tractor AT-602 agricultural airplane, N9017Z, registered to and operated by McAdoo Flying Service, Inc., of Crosbyton, Texas, impacted terrain following an in-flight collision with an unmarked and unlighted MET⁴ while maneuvering near Ralls, Texas.⁵ The commercial pilot, the sole occupant of the airplane, was fatally injured, and the airplane was destroyed. Visual meteorological conditions prevailed throughout the area and a flight plan was not filed for the 14 CFR Part 137 aerial application flight. The local flight originated from Crosbyton Airport, near Crosbyton, Texas.

On December 15, 2003, about 1416 Pacific standard time, an Erickson SHA Glasair TD homebuilt aircraft, N434SW, collided with an unmarked and unlighted MET and its wires during an unknown phase of operation about 1 nautical mile north of Vansycle, Oregon.⁶ The pilot and passenger sustained fatal injuries, and the airplane was destroyed. Visual meteorological conditions prevailed and a flight plan was not filed. The personal flight originated from Yakima, Washington, about 1345, and its destination was reported to be Walla Walla, Washington.

Discussion

METs can be erected quickly and, depending on their location, without notice to the local aviation community. In March 2011, the NTSB issued a safety alert⁷ about METs, noting that the speed with which they can be erected is an important aspect of this safety issue—in just a matter of hours, the navigable airspace for low-flying operations can change without notice. In addition, because their height is typically just under the 200-feet-above-ground-level (AGL) threshold that requires Federal Aviation Administration (FAA) notification,⁸ including a marking and lighting plan, METs are often erected without markings and lighting. Because of these factors, pilots have reported difficulty seeing METs from the air (the following figure shows an example MET), which has led to accidents.

³ The permit for the MET was issued by Contra Costa County, which specified that the paint colors for the MET blend in with the surroundings and “have a reflectivity less than 55%.”

⁴ The original accident report referred to the MET as an antenna tower.

⁵ More information about this accident, NTSB case number DFW05LA126, is available at <http://www.nts.gov/aviationquery/index.aspx>.

⁶ More information about this accident, NTSB case number SEA04LA027, is available at <http://www.nts.gov/aviationquery/index.aspx>.

⁷ NTSB Safety Alert SA-016 highlights the dangers of METs and provides links to resources where pilots can find additional information; it is available at http://www.nts.gov/doclib/safetyalerts/SA_016.pdf.

⁸ Title 14 CFR 77.9, “Construction or alteration requiring notice” states, in part, that “If requested by the FAA, or if you propose any of the following types of construction or alteration, you must file notice with the FAA of: (a) Any construction or alteration that is more than 200 ft. AGL at its site.”



Figure. A photograph showing a MET (indicated by the black arrow), as seen from an accident site (NTSB case number WPR11LA094).

Currently, it is unknown how many METs are erected in the United States. Unless notice is required by other provisions in 14 CFR Part 77,⁹ the FAA does not conduct an aeronautical study of any structure less than 200 feet AGL at its site. On January 5, 2011, acknowledging that METs often fall outside of FAA regulations governing tall structures and their impact on navigable airspace, the FAA published a notice seeking comments on a proposed revision to Advisory Circular (AC) 70/7460-1, “Obstruction Marking and Lighting,” that is intended to establish “a uniform and consistent scheme for voluntarily marking” METs less than 200 feet AGL (76 *Federal Register* 490). In June 2011, the FAA published a policy statement announcing its approval of the recommended guidance (76 *Federal Register* 36983). According to the FAA, no further action on MET requirements is presently being considered. The NTSB is recommending in a separate letter that the FAA amend Part 77 to require marking and registration of all METs and create a nationwide registry.

⁹ In addition to height considerations, section 77.9 requires that notice for proposed structures be filed with the FAA based on proximity to an airport, location, and frequencies emitted from the structure.

In the absence of a federal requirement concerning METs, 10 states have taken action to implement requirements for METs at the local level. All of these states have enacted or initiated legislation requiring that wind measurement towers 50 feet AGL and taller be marked. Specifically, Idaho, Kansas, Mississippi, and South Dakota require that METs be clearly marked, and California and Missouri have proposed similar legislation.¹⁰ In addition to requiring that METs be marked, four states—Montana, Nebraska, North Dakota, and Wyoming—also require that all METs in these states be registered in a directory noting their locations.

The NTSB is encouraged by the state laws passed and pending on this safety issue, particularly those that require both MET marking and registration. Maintaining a directory of MET locations provides pilots with useful information and an added layer of protection in instances where environmental conditions may hamper visibility, such as at night. As the wind energy industry expands,¹¹ the deployment of METs will also increase. The NTSB is concerned that, without measures to enhance their conspicuity and record their locations, METs pose a continuing hazard to low-altitude aviation operations. The NTSB believes that those states that have passed or pending legislation requiring the clear marking of METs should consider also requiring that they be registered.

Therefore, the National Transportation Safety Board makes the following recommendation to the 46 states, 4 territories, and DC without the following legislation:

Enact legislation requiring that meteorological evaluation towers erected in your state or territory are marked and registered in a directory. (A-13-21)

The NTSB also issued two safety recommendations to the FAA; one safety recommendation to the Department of the Interior, the Department of Agriculture, and the Department of Defense; and two safety recommendations to the American Wind Energy Association. In response to the recommendation in this letter, please refer to Safety Recommendation A-13-21. We encourage you to submit updates electronically at the following e-mail address: correspondence@ntsb.gov. If your response, including attachments, exceeds 10 megabytes, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, ROSEKIND, and WEENER concurred in this recommendation.

[Original Signed]

By: Deborah A.P. Hersman,
Chairman

¹⁰ For more information, see the website for Harness Energy, a company that specializes in MET installation (<http://www.harnessre.com/map> [accessed May 10, 2013]).

¹¹ For example, a February 2011 joint press release by the Department of the Interior and Department of Energy announced a “coordinated strategic plan to accelerate the development of offshore wind energy” in the United States. For more information, see <http://www.doi.gov/news/pressreleases/Salazar-Chu-Announce-Major-Offshore-Wind-Initiatives.cfm> (accessed May 10, 2013).

Distribution—50 US States and Territories and District of Columbia

The Honorable Robert Bentley
Governor of Alabama
State Capitol
600 Dexter Avenue
Montgomery, AL 36130-2751

The Honorable Sean Parnell
Governor of Alaska
State Capitol
PO Box 110001
Juneau, AK 99811-0001

The Honorable Jan K. Brewer
Governor of Arizona
State Capitol
1700 West Washington Street
Phoenix, AZ 85007-2812
The Honorable Mike Beebe
Governor of Arkansas
State Capitol
Room 250
Little Rock, AR 72201-3405

The Honorable Jerry Brown
Governor of California
State Capitol
Suite 1173
Sacramento, CA 95814-4910

The Honorable John Hickenlooper
Governor of Colorado
136 State Capitol
Denver, CO 80203-1792

The Honorable Dan Malloy
Governor of Connecticut
210 Capitol Avenue
Hartford, CT 06106-1535

The Honorable Jack Markell
Governor of Delaware
Tatnall Building, Second Floor
150 Martin Luther King, Jr., Boulevard
Dover, DE 19901-3637

The Honorable Rick Scott
Governor of Florida
The Capitol
400 South Monroe Street
Tallahassee, FL 32399-0001

The Honorable Nathan Deal
Governor of Georgia
State Capitol
Room 203
Atlanta, GA 30334-1600

The Honorable Neil Abercrombie
Governor of Hawaii
Executive Chambers
State Capitol
Honolulu, HI 96813-2425

The Honorable C. L. "Butch" Otter
Governor of Idaho
State Capitol
PO Box 83720
Boise, ID 83720-0003

The Honorable Pat Quinn
Governor of Illinois
State House
Room 207
Springfield, IL 62706-9998

The Honorable Mitch Daniels
Governor of Indiana
State House
Room 206
Indianapolis, IN 46204-2797

The Honorable Terry Branstad
Governor of Iowa
State Capitol
1007 East Grand Avenue
Des Moines, IA 50319-0001

The Honorable Sam Brownback
Governor of Kansas
241S State Capitol
300 SW 10th Avenue
Topeka, KS 66612-1590

The Honorable Steve Beshear
Governor of Kentucky
700 Capitol Avenue
Suite 100
Frankfort, KY 40601-3454

The Honorable Bobby Jindal
 Governor of Louisiana
 PO Box 94004
 Baton Rouge, LA 70804-9004

The Honorable Paul LePage
 Governor of Maine
 1 State House Station
 Augusta, ME 04333-0001

The Honorable Martin O'Malley
 Governor of Maryland
 100 State Circle
 Annapolis, MD 21401-1925

The Honorable Deval Patrick
 Governor of Massachusetts
 State House
 Room 280
 Boston, MA 02133-1002

The Honorable Rick Snyder
 Governor of Michigan
 PO Box 30013
 Lansing, MI 48909-7513

The Honorable Mark Dayton
 Governor of Minnesota
 130 State Capitol
 75 Martin Luther King, Jr., Boulevard
 St. Paul, MN 55155-1601

The Honorable Haley Barbour
 Governor of Mississippi
 PO Box 139
 Jackson, MS 39205-0139

The Honorable Jay Nixon
 Governor of Missouri
 PO Box 720
 Jefferson City, MO 65102-0720

The Honorable Brian Sandoval
 Governor of Nevada
 State Capitol
 101 North Carson Street

Carson City, NV 89701-5336

The Honorable John Lynch
 Governor of New Hampshire
 State House
 107 North Main Street
 Concord, NH 03301-4951

The Honorable Chris Christie
 Governor of New Jersey
 State House
 PO Box 001
 Trenton, NJ 08625-0001

The Honorable Susana Martinez
 Governor of New Mexico
 State Capitol
 Room 400
 Santa Fe, NM 87501-2704

The Honorable Andrew M. Cuomo
 Governor of New York
 State Capitol
 Albany, NY 12224-0343

The Honorable Beverly Perdue
 Governor of North Carolina
 20301 Mail Service Center
 Raleigh, NC 27699-0301

The Honorable John R. Kasich
 Governor of Ohio
 Riffe Center, 30th Floor
 77 South High Street
 Columbus, OH 43215-6117

The Honorable Mary Fallin
 Governor of Oklahoma
 212 State Capitol
 2300 North Lincoln Boulevard
 Oklahoma City, OK 73105-4801

The Honorable John Kitzhaber
 Governor of Oregon
 160 State Capitol
 900 Court Street North
 Salem, OR 97301-4047

The Honorable Tom Corbett
 Governor of Pennsylvania
 225 Main Capitol Building
 Harrisburg, PA 17120-0062

The Honorable Lincoln Chafee
 Governor of Rhode Island
 222 State House
 Providence, RI 02903-1196

The Honorable Nikki R. Haley
 Governor of South Carolina
 1205 Pendleton Street
 Columbia, SC 29201-3756

The Honorable Dennis Daugaard
 Governor of South Dakota
 500 East Capitol Avenue
 Pierre, SD 57501-5001

The Honorable Bill Haslam
 Governor of Tennessee
 State Capitol
 Nashville, TN 37243-0001

The Honorable Rick Perry
 Governor of Texas
 PO Box 12428
 Austin, TX 78711-2428

The Honorable Gary R. Herbert
 Governor of Utah
 350 North State Street
 Suite 200
 PO Box 142220
 Salt Lake City, UT 84114-2220

The Honorable Peter Shumlin
 Governor of Vermont
 Pavilion Building
 109 State Street
 Montpelier, VT 05609-0101

The Honorable Bob McDonnell
 Governor of Virginia
 Patrick Henry Building, Third Floor
 1111 East Broad Street
 Richmond, VA 23219

The Honorable Chris Gregoire
 Governor of Washington
 Office of the Governor
 PO Box 40002
 Olympia, WA 95804-0002

The Honorable Earl Ray Tomblin
 Governor of West Virginia
 State Capitol
 1900 Kanawha Boulevard, East
 Charleston, WV 25305-0009

The Honorable Scott Walker
 Governor of Wisconsin
 115 East Capitol
 Madison, WI 53702-0100

The Honorable Alejandro Garcia Padilla
 Governor of Puerto Rico
 La Fortaleza
 PO Box 9020082
 San Juan, PR 00902-0082

The Honorable Vincent C. Gray
 Mayor of the District of Columbia
 1350 Pennsylvania Avenue, NW
 Suite 316
 Washington, DC 20004-3003

The Honorable Eloy S. Inos
 Governor
 Commonwealth of the Northern Mariana
 Islands
 Juan A. Sablan Memorial Building

Capital Hill, Caller Box 10007
Saipan, MP 96950

The Honorable John P. de Jongh
Governor
US Virgin Islands
Washington Office of the Governor of the
US Virgin Islands
444 North Capitol Street – Suite 305
Washington, DC 20001

The Honorable Lolo Matalasi Moliga
Governor
American Samoa
AP Lutali Executive Office Building
Pago Pago, AS 96799



National Transportation Safety Board

Washington, DC 20594

Safety Recommendation

Date: June 10, 2013

In reply refer to: A-13-21

The Honorable Eddie Baza Calvo
Governor
Guam
Ricardo J. Bordallo Governor's Complex
Adelup, Guam 96910

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. The NTSB determines the probable cause of the accidents and issues safety recommendations aimed at preventing future accidents. In addition, the NTSB carries out special studies concerning transportation safety and coordinates the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters. We are providing the following information to urge you to take action on the safety recommendation issued in this letter.

This recommendation addresses the need to mitigate risks to low-altitude aviation operations by requiring that meteorological evaluation towers (MET)¹ be marked and registered in a directory. It is derived from the NTSB's investigations of three accidents in which airplanes inadvertently collided with METs, fatally injuring four people. As a result of these investigations, the NTSB has issued six safety recommendations, one of which is addressed to Guam. Information supporting this recommendation is discussed below.

Accidents

On January 10, 2011, about 1057 Pacific standard time, the left wing of a Rockwell International S-2R, N4977X, impacted an unmarked and unlighted MET during an aerial seed application flight on Webb Tract Island, Oakley, California.² Witnesses reported that they did not

¹ METs are temporary structures used to measure wind speed and direction during the development of wind energy conversion facilities. METs are made from galvanized tubing (or other galvanized structure) with a diameter of 6 to 8 inches and are secured with guy wires that connect at multiple heights on the MET and anchor on the ground.

² More information about this accident, NTSB case number WPR11LA094, is available at <http://www.nts.gov/aviationquery/index.aspx>.

see the airplane perform any evasive maneuvers before the impact, indicating that the pilot did not see the obstruction. The pilot was fatally injured, and the airplane sustained substantial damage. Visual meteorological conditions prevailed and no flight plan was filed for the 14 *Code of Federal Regulations* (CFR) Part 137 flight. The NTSB's investigation found that the county permit³ for the MET had expired more than a year before the accident, but the MET had not been removed as stipulated by the permit's conditions of approval.

On May 19, 2005, about 0944 central daylight time, a turbine-powered Air Tractor AT-602 agricultural airplane, N9017Z, registered to and operated by McAdoo Flying Service, Inc., of Crosbyton, Texas, impacted terrain following an in-flight collision with an unmarked and unlighted MET⁴ while maneuvering near Ralls, Texas.⁵ The commercial pilot, the sole occupant of the airplane, was fatally injured, and the airplane was destroyed. Visual meteorological conditions prevailed throughout the area and a flight plan was not filed for the 14 CFR Part 137 aerial application flight. The local flight originated from Crosbyton Airport, near Crosbyton, Texas.

On December 15, 2003, about 1416 Pacific standard time, an Erickson SHA Glasair TD homebuilt aircraft, N434SW, collided with an unmarked and unlighted MET and its wires during an unknown phase of operation about 1 nautical mile north of Vansycle, Oregon.⁶ The pilot and passenger sustained fatal injuries, and the airplane was destroyed. Visual meteorological conditions prevailed and a flight plan was not filed. The personal flight originated from Yakima, Washington, about 1345, and its destination was reported to be Walla Walla, Washington.

Discussion

METs can be erected quickly and, depending on their location, without notice to the local aviation community. In March 2011, the NTSB issued a safety alert⁷ about METs, noting that the speed with which they can be erected is an important aspect of this safety issue—in just a matter of hours, the navigable airspace for low-flying operations can change without notice. In addition, because their height is typically just under the 200-foot above ground level (AGL) threshold that requires Federal Aviation Administration (FAA) notification,⁸ including a marking and lighting plan, METs are often erected without markings and lighting. Because of these factors, pilots have reported difficulty seeing METs from the air (the following figure shows an example MET), which has led to accidents.

³ The permit for the MET was issued by Contra Costa County, which specified that the paint colors for the MET blend in with the surroundings and “have a reflectivity less than 55%.”

⁴ The original accident report referred to the MET as an antenna tower.

⁵ More information about this accident, NTSB case number DFW05LA126, is available at <http://www.nts.gov/aviationquery/index.aspx>.

⁶ More information about this accident, NTSB case number SEA04LA027, is available at <http://www.nts.gov/aviationquery/index.aspx>.

⁷ NTSB Safety Alert SA-016 highlights the dangers of METs and provides links to resources where pilots can find additional information; it is available at http://www.nts.gov/doclib/safetyalerts/SA_016.pdf.

⁸ Title 14 *Code of Federal Regulations* 77.9, “Construction or alteration requiring notice” states, in part, that “If requested by the FAA, or if you propose any of the following types of construction or alteration, you must file notice with the FAA of: (a) Any construction or alteration that is more than 200 ft. AGL at its site.”



Figure. A photograph showing a MET (indicated by the black arrow), as seen from an accident site (NTSB case number WPR11LA094).

Currently, it is unknown how many METs are erected in the United States. Unless notice is required by other provisions in 14 CFR Part 77,⁹ the FAA does not conduct an aeronautical study of any structure less than 200 feet AGL at its site. On January 5, 2011, acknowledging that METs often fall outside of FAA regulations governing tall structures and their impact on navigable airspace, the FAA published a notice seeking comments on a proposed revision to Advisory Circular (AC) 70/7460-1, “Obstruction Marking and Lighting,” that is intended to establish “a uniform and consistent scheme for voluntarily marking” METs less than 200 feet AGL (76 *Federal Register* 490). In June 2011, the FAA published a policy statement announcing its approval of the recommended guidance (76 *Federal Register* 36983). According to the FAA, no further action on MET requirements is presently being considered. The NTSB is recommending in a separate letter that the FAA amend Part 77 to require marking and registration of all METs and create a nationwide registry.

⁹ In addition to height considerations, section 77.9 requires that notice for proposed structures be filed with the FAA based on proximity to an airport, location, and frequencies emitted from the structure.

In the absence of a federal requirement concerning METs, 10 states have taken action to implement requirements for METs at the local level. All of these states have enacted or initiated legislation requiring that wind measurement towers 50 feet AGL and taller be marked. Specifically, Idaho, Kansas, Mississippi, and South Dakota require that METs be clearly marked, and California and Missouri have proposed similar legislation.¹⁰ In addition to requiring that METs be marked, four states—Montana, Nebraska, North Dakota, and Wyoming—also require that all METs in these states be registered in a directory noting their locations.

The NTSB is encouraged by the state laws passed and pending on this safety issue, particularly those that require both MET marking and registration. Maintaining a directory of MET locations provides pilots with useful information and an added layer of protection in instances where environmental conditions may hamper visibility, such as at night. As the wind energy industry expands,¹¹ the deployment of METs will also increase. The NTSB is concerned that, without measures to enhance their conspicuity and record their locations, METs pose a continuing hazard to low-altitude aviation operations. The NTSB believes that those states that have passed or pending legislation requiring the clear marking of METs should consider also requiring that they be registered.

Therefore, the National Transportation Safety Board makes the following recommendation to Guam:

Enact legislation requiring that meteorological evaluation towers erected in your state or territory are marked and registered in a directory. (A-13-21)

The NTSB also issued two safety recommendations to the FAA; one safety recommendation to the Department of the Interior, the Department of Agriculture, and the Department of Defense; and two safety recommendations to the American Wind Energy Association. In response to the recommendation in this letter, please refer to Safety Recommendation A-13-21. We encourage you to submit updates electronically at the following e-mail address: correspondence@ntsb.gov. If your response, including attachments, exceeds 10 megabytes, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, ROSEKIND, and WEENER concurred in this recommendation.

[Original Signed]

By: Deborah A.P. Hersman,
Chairman

¹⁰ For more information, see the website for Harness Energy, a company that specializes in MET installation (<http://www.harnessre.com/map> [accessed May 10, 2013]).

¹¹ For example, a February 2011 joint press release by the Department of the Interior and Department of Energy announced a “coordinated strategic plan to accelerate the development of offshore wind energy” in the United States. For more information, see <http://www.doi.gov/news/pressreleases/Salazar-Chu-Announce-Major-Offshore-Wind-Initiatives.cfm> (accessed May 10, 2013).