

LIGHTNING DATA CENTER MINUTES
JULY 29 AND AUGUST 12, 2011
ST. ANTHONY CENTRAL HOSPITAL, DENVER, CO

Monthly Quote: "Television news is like a lightning flash. It makes a loud noise, lights up everything around it, leaves everything else in darkness and then is suddenly gone." -- Hodding Carter

1. The July Coors Field Tour began at 11:00 AM and ended at 12:00 PM. The August meeting has held at the new St. Anthony's Hospital facility in Lakewood, Colorado. The meeting began at 11:45 PM and adjourned at 1:10 PM. I want to thank Greg Stewart for his extensive help with the August portion of the minutes.



Inaugural Meeting at the new St. Anthony's Hospital in Lakewood, Colorado 8-9-11

Pictured Front, Left to Right: Clark, Cui-Gift with Sheeler. Back Row, Left to Right: Michael and Nancy Cherington, Wachtel, Yarnell, Nitka, and Stewart.

2. Members present at the tour: Clark, Yarnell, Stewart, Wachtel (Howard and Clara), Cherington, and Foley (Michael and Linda). Members present at the August meeting: Cherington (Mike and Nancy), Yarnell, Stewart, Clark, Wachtel, Nibbe, Wells, Gift, Cui-Gift, Elder, Nitka, and Glancy. Clark moderated the meeting.
3. On Friday, July 29, an intimate group of eight LDC members were treated to a tour of Coors Field, with about 25 minutes being a condensed public tour and the remainder given over to a presentation of the lightning protection system. The public tour portion consisted of a view of the field from the dugout. A turf company in Fort Morgan grew the sod. The same turf company also grows the turf for the University of Notre Dame. When fall changes to winter, the grass at the ballpark turns brown, with winterkill, like any other yard in Denver. Then, around mid-February, Coors Field personnel will turn on underground heaters and heat the sod to 58 Deg. F. This regenerates the grass, so that a green field will be available for opening day. Coors Field is now the 4th oldest field in the National League, behind only Wrigley Field in Chicago, Dodgers Stadium in LA, and the Florida Marlins facility. Soon, it will be the third oldest, since the Florida Marlins are getting a new baseball-only park in Miami, and then they'll become the Miami Marlins. After the dugout visit, we went up to the luxury suites. Since Colorado has the most 14,000-foot peaks in the nation, the suites are named after 14ers. The largest is, of course, the Elbert suite, which is not available for public rental. Only high-powered people, like former President Bush, are offered access to that suite. We did get to see the largest suite available for rental. Basically, it is a large room with a couch, refrigerator (stocked with food and drink according to the wishes of the people renting it), and private restroom, and two rows of outdoor balcony seating immediately in front of the room.

Following the public tour, we were given an explanation of how the lightning protection system works by James Wiener, an engineer with the Rockies for 18 years. The Rockies use an early streamer device (ESD) called a Prevectron, which looks somewhat like a short, stubby missile. The "fins" are actually electrodes, which collect a charge when the electrical field rapidly changes, such as during a thunderstorm. The charge is stored in a capacitor. When lightning is eminent, a charge will rapidly accumulate in the capacitor. At a pre-set threshold, the stored energy is discharged through a pointed electrode at the top of the Prevectron, forming an upward leader, which should (Hopefully!) connect with a downward leader, forming a lightning flash. The current is then safely conducted into a large grounding loop beneath the facility. All of the Prevectrons are connected to the same grounding loop using braided cable, which is about the diameter of your thumb. One of the Prevectrons is known to have been hit by lightning. There was not any outward visible evidence of a hit, but when the unit was tested, test results showed it had been hit by lightning and the unit had to be replaced. There are at least four Prevectrons, one on each side of the baseball diamond. To the best of Jim's knowledge, there have been no human fatalities or

injuries due to lightning at the ballpark, nor has there been any lightning-induced damage at the facility. The Rockies are presently evaluating an upgrade of the protection system. A set of follow-up questions posed by LDC member Greg Stewart has been sent to the Rockies. We'll let you know what they say.

Finally, per MLB regulations, at every major-league baseball diamond, the field lighting is required to be at a certain level of luminosity in the infield and a lesser level of luminosity in the outfield. To test this, little flags are placed all over the playing surface and readings are taken. If the lighting is out of compliance, it is the facility's responsibility to correct the deficiency.

Thank you to all of the staff at the Colorado Rockies for this tour. Attendees found it to be an enjoyable excursion and were most appreciative.

4. Special guest Jeff Huber, PA-C with Surgical Specialists of Colorado, expressed his concerns about lightning safety for the USA Pro Cycling Challenge taking place in Colorado, August 22-28. To get a sense of lightning activity in the mountains this time of year, safety issues and detection, several references were discussed including the Colorado Lightning Resource Center in Pueblo, Colorado (NWS/NOAA), Vaisala's National Lightning Detection Network (NLDN) and Weather Services International's (WSI) U.S. Precision Lightning Network (USPLN). The Colorado Lightning Resource Page highlights safety basics, including risk reduction guidelines and definition of "safe shelter." The page reminds readers: "There is *nothing* you can do to substantially reduce your risk if you remain outside and lightning is occurring." Referencing regional archived lightning data and/or real-time data was also considered useful. Colorado Lightning Resource Page link:
<http://www.crh.noaa.gov/pub/?n=lrg.php>

Dr. Michael Cherington noted that the bicycle race coincides with high-risk factors including exposure, location, time of year, and time of day. Basic measures such as the availability of vehicles for shelter was discussed. Huber indicated that the remainder of any given race segment would be cancelled in the face of lightning threat. The general consensus was that the event would likely place racers, organizers, media and spectators at risk.

Howard voiced his thoughts about lightning and the bicycle race via e-mail as follows: "As I said at the last meeting (perhaps after Michael and Phil left), I don't think its feasible to expect entire bike races to be scrubbed or relocated based on a probability of lightning during a given season or even on a given day. I think, however, that devising some strategy whereby a race can be halted for some minutes when lightning is imminent --- while the riders and spectators deploy to a "best available shelter" (BAS) would be feasible --- if there is the medico-political will to do so. Depending on the terrain and crowd concentration, such a BAS might be the ubiquitous team cars that follow the racers, nearby spectators' cars, or buses, nearby buildings, etc. --- or simply

away from trees and high spots. If nothing else is available, simply crouching down in ditches or other low spaces away from trees is better than nothing. The situation here is akin to what the golfers faced a few years back -- when it was “unthinkable” to halt play in a major tournament for something as “whimsical” as lighting danger. The PGA and golf courses now have well defined rules for stopping play and protecting spectators during “high risk of lightning episodes”. Another analogy is the “yellow warning flag” stoppage of an auto race for some minutes following an accident or some other emergency.”

Howard also presented two highly different approaches to government entities deal with risk. In one case, inner-tubers were on Boulder Creek during a time of very high flow, with large rocks in the creek bed. There were no signs advising of hazard or prohibiting use of the creek. Also, law enforcement officers did not take any action to get tubers out of the creek. In another case, swimmers can swim in Boulder Reservoir in waters that are no more than 4 feet deep and six, perhaps more, lifeguards are present. Howard thinks from a liability standpoint, it is better to have no safeguards than to have an intermediate level of safeguards.

5. Greg Stewart also provided some follow-up information on the so-called "Boltmeter" (link: <http://www.boltmeter.com/>) introduced at the June LDC meeting. In response to concerns raised over data lag for this type of mobile application, WSI Corp. (manufacturer of integrated lightning detection and warning systems), claims real-time data (95% efficiency rating) is delivered with less than 1-minute latency. It is a compass-based system with distance and direction information. Because of variable efficiencies and accuracy of data interpretation, their literature states: "...using a single lightning detection method as your only safety measure in severe weather is highly unwise." In addition, a notice on all proximity map displays reads: *"NOT FOR PROTECTION OF LIFE OR PROPERTY."* Both the NLDN and USPLN provide real-time and archived flash information including location, time, polarity and amplitude. Vaisala's NLDN link: <http://www.vaisala.com/en/products/thunderstormandlightningdetectionsystems/Pages/NLDN.aspx> USPLN link: <http://www.uspln.com/index2.html>. Greg suggested that using low-tech options like listening for thunder and looking for flashes are practical early warning methods. These remain fundamental cues to seek safe shelter.
6. Greg reported hearing a recent lightning-related radio segment on NPR's "Talk of the Nation." The show focused on the Grand Teton lightning incident of last year. An article by Brad Wiener entitled "Countdown To Tragedy" (7/18/2011) detailed the events. One of the climbers commented on being struck: "It was the most painful thing. I've been through childbirth and that was zero compared to this. It was like someone injecting hot oil directly into my veins." A link to the article can be found below in the “Lightning in the News” section.

7. Clark presented news of an article where a Colorado Springs area student-athlete asked the school district about lightning safety at outdoor sports events. The student was told the district would consider the question. Clark wondered if the LDC should approach the district with the possible recommendation of school buses as shelter, just as the USGA does. Members present at the meeting generally felt it would be appropriate to do so, but expressed concerns about the availability of shelter, both permanent and temporary, and the distances that would be covered in getting to shelter.
8. Clark presented an article describing a lightning strike during a motocross race near Ellicott, Colorado in eastern El Paso County. The lightning struck “from out of nowhere”, knocking five people down and sending a woman to the hospital. The owner of the racetrack saw a large storm to the south, but thought the storm was headed in a different direction. Before there was any wind or rain, the lightning hit. This case is somewhat reminiscent of the Portage case presented in the May 2011 minutes.
9. These minutes do not represent official positions of LDC or its members. They simply reflect the comments made at the meeting. The LDC does not explicitly or implicitly recommend or endorse *any* product or service. Any service or product presented in these minutes is done so for the purpose of discussion and analysis. The merit (or lack thereof) is open for consideration and review by the entire membership.
10. Next meeting: Friday, September 8, 2011 at 11:45 AM in a Conference Room at St. Anthony Hospital West. Subject: TBA.

Respectfully Submitted,

Steven E. Clark, Consulting Meteorologist

In Case You Missed It...Lightning in the News

This is a monthly listing of news and videos about lightning and allied areas as reported in the media. A headline is listed, followed by a link to the article. Please note that some of the links are perishable, which means you'll need to go to the source for the article. Enjoy!

From the Salt Lake Tribune:

Lightning hits two Boy Scouts in Scofield; one dies

<http://www.sltrib.com/sltrib/news/52184119-78/lake-salt-scout-cordova.html.csp>

From the Sun Advocate (Carbon County paper in Utah)

Separate lightning strikes fatal for two in three days

http://www.sunad.com/index.php?tier=1&article_id=22339

From the Colorado Springs Gazette:

Teachers, parents, students toss questions to D-11 school board

<http://www.gazette.com/articles/board-105871-school-district.html>

Part of this article is a lightning safety question posed by a student-athlete.

Also from the Colorado Springs Gazette:

Popular Air Academy high teacher killed by lightning

<http://www.gazette.com/articles/academy-121674-air-christopher.html>

From the Denver Post:

2 Colo. Air National Guardsmen struck by lightning

http://www.denverpost.com/search/ci_18422386

From the Colorado Springs Gazette:

Lightning hits crowd at El Paso raceway

<http://www.gazette.com/articles/lightning-121982-raceway-strike.html>

From the Colorado Springs Gazette:

Lightning strikes house, igniting fire and displacing family

<http://www.gazette.com/articles/fire-122194-lighting-roof.html#ixzz1TPjKunHb>

From the Washington, PA Observer-Reporter:

11-year-old struck by lightning in yard

<http://www.observer-reporter.com/or/story11/07-27-2011-girl-hit-by-lightning>

“Countdown To Tragedy”

<http://sportsillustrated.cnn.com/vault/article/magazine/MAG1188183/index.htm>
