

Data Centers Workgroup

Project Engagement

VIEWS	PARTICIPANTS	RESPONSES	COMMENTS	SUBSCRIBERS
923	105	0	49	28

Let us know your thoughts about the data center industry in Frederick County.

Elizabeth (Betty) Law Please see the attached from William Steigelman, Vice Chair of the Fellowship of Scientists and Engineers. The attached provides technical information on noise and diesel fuel storage for emergency diesel generators requested by data centers. Thank you.



[Comments of Noise and Diesel Fuel Storage-2JAN2024.docx](#)

7 days ago

Elizabeth (Betty) Law Please consider the attached Proposal to revise the "Data Center Architectural Committee" to the "Data Center Technical Committee" . I am attaching both the proposal and the Sustainability Commission by-laws for your convenience. (Not sure how the portal works - so you may have two copies of each document. Thanks, Betty Law

7 days ago

Important Information for the Data Center Workgroup

DCWG Members,

Today is January 2, 2024. I hope you all have a very successful year as you wrap-up your DCWG deliberations.

At your December meeting I made brief remarks about two data-center issues that have not received much attention recently: **1) the noise produced by back-up generators**, and **2) storage of their diesel fuel**. At that time, I said I would send you more detailed remarks on these two subjects. Because of holiday gatherings with family members, I delayed forwarding my comments until today.

Just as hospitals, nursing homes, police and fire stations, and prisons, data centers, etc., need to keep operating even during rare occasions when grid power is not available, data centers also install back-up generators to continue operations at these times. The standard way other facilities ensure an uninterrupted supply of electricity is by installing a few fuel-burning engines – enough power to satisfy their most critical needs, which typically means 90% of interior lights remain off, food service is greatly reduced, and non-essential operations are terminated. Back-up power supply is typically only around 5% of normal power supply. Depending on the amount of equipment a facility has and how large the facility is, the “Back-up power generators” at a facility typically range in total capacity rating from a few hundred kilowatts (kW) to a couple of megawatts (MW), or up to 8 to 10 MW or so for a very large hospital or federal government facility.

Data centers have only a single purpose, and so their standard approach is to keep all equipment operating exactly as it does when power from the electric grid is available, and with less than a microsecond or so of interruption. This means the amount of back-up power needed is generally exactly the same as the amount of grid power that would have been consumed if it had been available. Because most datacenters are very large multi-story buildings filled with data-processing equipment that operates around the clock, they use a great deal of electricity -- even at night, when a large number building- and pole-mounted outdoor security lights are energized. The first “hyper-scale” data center to be granted Site Plan approval in Frederick County had a peak power demand during hot summer days of 128 MW, which we believe is about average – some data centers are physically larger and have a greater peak-power demand, and some facilities are a bit smaller. Because the power demand during the winter months is only slightly lower, I “guess-timate” that the average power demand of the data centers that are commonly being built now is in the 110 MW to 150 MW range. This is the same as the peak power output of the back-up generators, which is about 10 times larger than the back-up generators at other types of very large facilities.

Because a) the total generation capacity is similar in size to that of many of the power plants that supply power to the electric grid, b) it is more than 10 to 40 times larger than the back-up generators that the MD Public Service Commission (PSC) has previously exempted from obtaining a “CPCN certificate” to operate, and c) it exceeds the 70 MW limit on the size that is eligible for an exemption, the PSC announced that it would not grant an exemption. The PSC also expressed concerns about the environmental effect these engines will have, because all engines will run continuously at or near full output for possibly more than 24 hours. **The concerns mentioned were: GHG emissions; other emissions that are harmful to the health of humans, pets, cattle, horses, etc.; and harmful noise.** Because the PSC rejected the application for an exemption from the requirement that this certificate be obtained, Aligned Data Centers (ADC -- the firm that had County Site Plan approval to build the first of four identical data centers) announced it will build none of them in Maryland. It has been reported that other firms have purchased sites but are waiting to learn whether Governor Moore is successful in his attempts to persuade the legislature to modify the current requirements associated with obtaining an exemption from obtaining the CPCN certificate.

Our County has a Noise Ordinance but this document and the CDI Ordinance both state that: a) equipment that operates during emergencies is exempt from all noise regulations, and b) a grid power outage is an emergency. **THIS EXCEPTION MUST BE CHANGED!** Suppose 15 large data centers are built within a mile or two of a home, public building, or the road next to one of the data centers, where a family may have been driving when a tire went flat, or some other event disabled the vehicle. Since each of the data centers has about 40 to 50 diesel generators (about 400 to 450 altogether) running at or close to full power, the noise level to which the public will be horrendous and is likely to be extremely painful to infants and children (whose hearing is fragile and easily damaged). If there is any trauma or pain, the County will be sued for not having regulations that prevent harm to the public – the data centers will just say they followed all the County's requirements.

I have found no evidence that any data center has ever been asked to obtain test data when all back-up generators at even one data center operate at full output power, or to calculate an estimate of the noise level. Testimony at the ADC Site Plan Approval hearing last May provides a real-world example of how a data center deals with noise from back-up generators. ADC's Noise expert testified that they measured noise levels at 5 locations along the site boundary when one or two engines were running. In both sets of tests, the 70 dBA noise limit was not exceeded, with a maximum reading of 68 dBA. The witness explained that 70 dBA is the criterion because the site is zoned Industrial. That was the full oral testimony, which largely duplicated the text in the Planning Commission Staff report (which is the only written information that is available for public inspection aside from the recording of all testimony at the hearing).

As an engineer, I believe what is missing from the record is: a) the engines' RPM and power level (since these parameters affect the noise level), and b) the measured or calculated noise level when all engines operate simultaneously at the maximum power level they will produce when there is a grid outage. Noise level estimates prepared by individuals who are highly trained in performing the calculations, should be required at for all the various locations where adults and children may be located, including stores, homes, schools, houses-of-worship, and roadways.

A related problem is the fact that the word "fuel" does not appear in the CDI Ordinance -- data centers are not required to tell the County how much highly flammable diesel fuel will be stored at their site, where it will be located, how resistant fuel-storage containers are to leakage if a tornado or earthquake occurs, and what fire-fighting equipment will be present at the site and activated as soon as a fire occurs. Because these questions are not asked, in the ordinance or even orally, the subject is totally unaddressed. Aren't these critically important items of information. Shouldn't the professional and volunteer fire fighters know this and be trained to deal with large oil-fed fires? How could the County fail to deal with obvious hazards and threats to the health and safety of citizens? And why hasn't the current TOTALLY INADEQUATE AND DANGEROUS CDI Ordinance been withdrawn from use until its omissions are fixed?

A brief additional comment: One thing that our little group of volunteers has learned is that data centers publish very little data and tend to be highly secretive. They will only answer questions asked when they apply for a permit from a government agency and never voluntarily disclose anything that may have a negative connotation.

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