BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

IN THE MATTER OF:	)	
	)	
NATURAL GAS-FIRED, PEAK-LOAD	)	R01- 10
ELECTRICAL POWER GENERATING	)	
FACILITIES (PEAKER PLANTS)	)	

TESTIMONY OF GREG ZAK

Ladies and gentlemen of the Board, my name is Greg Zak. I am the Noise Advisor for the Illinois EPA. I have been asked to testify today to provide information relating to potential noise issues at natural gas-fired peaker plants.

I would like to briefly describe my experience and duties at Illinois EPA. I have over 28 years of experience dealing with noise measurement, noise control engineering and the effects of noise on people and communities. This experience includes industrial, commercial, residential, urban, rural and construction noise. I have acted as the Illinois EPA noise expert in enforcement and regulatory hearings before the Illinois Pollution Control Board, Federal Bankruptcy Court, and in several Illinois Circuit Court hearings related to noise zoning and nuisance. I have been a member of a Society of Automotive Engineering Committee, and a member of the American National Standards Institute Working Group on the Measurement and Evaluation of Outdoor Community Noise. I was selected by Governor Edgar to sit on the Blasting Task Force mandated by House Joint Resolution 133 and chaired by the Illinois Department of Natural Resources.

I have frequently testified at noise enforcement hearings before the Board regarding noncompliance and appropriate remedy. Noise issues dealt with have frequently involved the technical practicability and economic reasonableness of reducing or eliminating the noise emissions from the source.

As a national and international author in the area of environmental noise, I have presented papers on controlling noise at national and international noise conferences. I am currently a member of the working group for the American National Standards Institute's American National Standard for "Quantities and Procedures for Description and Measurement of Environmental Sound -- Part 5: Sound Level Descriptors For Determination of Compatible Land Use, ANSI S12.9-199x--Part 5.

I have passed the required written examination, and have been elected a member in good standing by the Officers and Board of Directors of the Institute of Noise Control Engineering (INCE).

I currently manage the noise program at the Illinois EPA. My annual responsibilities include assisting approximately 2000 citizens with noise complaints, and approximately 1000 informational calls dealing with technical questions about noise pollution measurement and control. I also testify at many noise enforcement hearings and take noise measurements when necessary. In addition to the Noise Advisor, there is one additional person in the noise program. This person is an assistant. The current responsibilities of the noise program consume all of our available work hours.

Since previous testimony has described peaker plants in detail, I will confine my narrative to the potential noise issues related to today’s topic.

Peaker plants pose a greater threat than other types of State regulated facilities with respect to noise pollution because the gas turbine engine used in peakers is one of the most powerful (loudest) noise sources in the U.S. The noise power that must be contained and neutralized in the peaker is tremendous. The potential for releasing great amounts of sound power, poses a greater threat than most other types of State regulated facilities. Its characteristic emissions can be nuisance noise (35 Ill. Adm. Code 900.102), broadband noise (35 Ill. Adm. Code 901.102(b)), and tonal noise (35 Ill. Adm. Code 901.106).

Peaker noise emissions can greatly exceed the limits required in 35 Ill. Adm. Code 900.102, 901.102(b), and 901.106. This can occur if the noise is not controlled in the peaker housing, and the utilization of whatever land buffer or setback needed is not considered when choosing a site.

Peaker noise control is accomplished through four noise control strategies. The first three of these address noise reduction at the peaker itself. Rough approximations are presented in the form of percentages rather than in the decibel limits found in 35 Ill. Adm. Code 901.102(b). Percentages are easier for the average person, who is not an acoustician, to understand. Accurate and adequate noise control of peakers must be based on the decibel limits in Section 901.102(b).

The first control strategy is comprised of combustion air intake silencers which, when properly designed and installed in the average peaker, reduce the intake noise by approximately 99.999% to 99.99999%. Second, a hardened acoustic enclosure completely containing the gas turbine. It traps over approximately 99.999% to 99.99999% of noise radiated from the outer shell of the turbine. Third, a combustion gas

exhaust silencers which, when properly designed and installed, reduce the exhaust noise by approximately 99.9999% to 99.999999%. Finally, a buffer of land, controlled by the peaker plant, sufficient to provide enough distance for the noise escaping the plant to dissipate sufficiently to meet all State noise pollution requirements. This land buffer should be based on the amount of noise reduction needed at the property line of the power facility.

Another control strategy involves a new technology called "active noise cancellation." This promises the potential of being able to cancel much of the very low frequency (rumble) noise associated with large gas turbines. This technology should be viewed with caution due to its unproven record when used in low cost applications. However, it could be considered when the more traditional silencer technology is not able to satisfactorily address the rumble problem.

Setbacks are an important concept in addressing peaker noise. A need exists for setbacks (land buffers) consisting of land owned or controlled by the peaker plant. The setback distance necessary would depend on what level of noise abatement was included in the initial design of the peaker plant. The most frequently encountered noise pollution problem seen in complaints and noise pollution enforcement cases before the Board is that of residential development eventually coming to the nuisance noise emissions. A facility may be in compliance, even though noisy, because it is not near residential property. If the facility does not control the use of the surrounding property, such a scenario is likely to occur. There is nothing to stop the farm owner (the typical situation) from selling the land for residential development, and the facility no longer has the luxury of a large distance to the nearest home.

To avoid the problem of peaker noise impacting noise sensitive areas, compliance reviews (on paper) of the facility designs are essential to insure future compliance with the Noise Regulations. Then, before full operation is started, the peaker should show that it can be operated at or below the nighttime noise limits (35 Ill. Adm. Code 901.102(b)). If a peaker plant could not show compliance through a demonstration, the problems could be resolved at the beginning. All of this argues strongly that the design and noise compliance review of that design are the most important project events. Designing and adding on noise compliance after the plant is built may be next to impossible.

Other state noise programs were reviewed to see if new or unique regulatory methods are in use. My review of a report of noise regulation in the U.S. (see Illinois EPA Exhibit 19) shows that noise abatement is not regulated by 43 states. Six states have very little noise regulation. Illinois is more active than the others in regulating noise. Peaker noise is not regulated by the other Region 5 states, California, Texas, or New York. However, please remember that the noise may be regulated by local ordinance in some of these states. It should be noted that in many of these states that have little state regulation, the larger cities may conduct regulation of noise through local ordinances. Finally, peaker noise is not regulated on the federal level.

Another concern over potential peaker noise problems is the potential for impacting property values. As with any other types of industrial noise sources, if the peakers exceeded the noise regulations, they could have a significant effect on negatively impacting property values. Noise at such levels would likely be noticeable by prospective purchasers of property, and any potential commercial investors.

Local zoning has been a significant factor in many of the noise complaints I have handled. In my experience with the noise complaints filed with the Board, it appears that local zoning has not considered the land buffer component of noise control in making zoning decisions. Of course, the reason may be that the noise level from the facility may not be appreciated, or even understood, until the facility is built and operating. This issue also strongly argues for the importance of pre-construction design review.

The Illinois EPA has received no noise complaints regarding existing peaker plants, so it would be difficult for me to comment on more stringent regulation of the existing plants. Stricter noise emission control could first be considered for new facilities and expansions. Upgrading costs would be extremely high, if not prohibitive, for added noise control. Silencing equipment comprises the bulk of the peaker plant and is carefully tuned to match the turbine. In some cases it may be less expensive to install a whole new unit than try to upgrade the old one.

Questions will arise regarding the economic impact of potential additional requirements. The cost could be anywhere on the spectrum depending on how stringent the requirements are made. However, I can confidently say that adding additional noise control in the design stage is much less expensive than adding it on after the installation is operational.

I cannot say that there are currently any gaps in the regulations. It may be that there is inadequate pre-construction design work and design review relevant to noise compliance issues. I believe that considerable information would be available from the turbine manufacturer that could be evaluated by a competent noise consultant to help

design the four components of noise control I mentioned earlier: intake; turbine enclosure; exhaust; and, land buffer. Failure to adequately plan for any one of the four could lead to future noncompliance. It may be too late and/or too expensive to look at the problem only after numerous citizens are impacted to a nuisance level.

Thank you for listening.

Illinois Environmental Protection Agency

By: _____
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