STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's	:	
APPLICATION TO CONSTRUCT THE	:	DOCKET No. SB-2015-06
CLEAR RIVER ENERGY CENTER IN	:	
BURRILLVILLE, RHODE ISLAND	:	

DIRECT TESTIMONY OF DAVID M. HESSLER, P.E.,
ON BEHALF OF THE TOWN OF BURRILLVILLE

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Purpose:

The purpose of my testimony is to report my conclusions and recommendations to the Energy Facility Siting Board (EFSB) in connection with the noise aspects of the proposed Clear River Energy Center (CREC) permitting application.

Summary:

I have reviewed the noise impact assessments for the CREC project submitted by CREC to the EFSB, and subsequent documents and correspondence supplied in response to data requests. I have listened from sworn testimony from CREC's noise consultant. Based on the totality of the information received, I believe that CREC has committed in writing and under oath to ensure that noise from the plant will meet the Town's demanding Ordinance noise limit of 43 dBA at the nearest residences during all normal operating modes, including, importantly, start-up and shutdown. Compliance with this Ordinance limit is expected to result in a minimal adverse impact on the community from operational noise. I strongly recommend that the EFSB make this noise limit a strict condition of any EFSB permit during all normal operating modes, with firm penalties for non-compliance. I also recommend that this commitment be secured with a performance bond for any possible violations, and that such bond should be a condition of any EFSB permit. I do not expect low frequency noise from this facility to be problematic, but it is likely that moderate but temporary community noise impacts will occur during the construction and commissioning phases of the project, due mainly to on-site construction activities, truck traffic to the site and from steam blows and other venting. CREC should take all reasonable actions to reduce the noise impacts during construction.

Q. Please state your name and business address.

A. My name is David M. Hessler. My business address is 3862 Clifton Manor Place, Haymarket, VA 20169.

Q. Mr. Hessler, by whom are you employed and in what capacity?

A. I have been employed for over 26 years by Hessler Associates, Inc., and am currently the Vice President and a Principal Consultant. Hessler Associates, Inc. is an engineering firm that specializes in the acoustical design and analysis of industrial and power generation facilities.

Q. Please describe your educational background and your professional experience?

A. I received my Bachelor of Science in Mechanical Engineering (B.S.), 1997, *Summa cum Laude*, at the A. James Clark School of Engineering, University of Maryland, College Park, MD, and a Bachelor of Arts (B.A.), 1982, at the University of Hartford, Hartford, Connecticut. I am a registered Professional Engineer (P.E.) in the Commonwealth of Virginia and I am a member of the Institute of Noise Control Engineering (INCE). My resume was filed with the EFSB on September 9, 2016.

Q. What are your technical specialties?

A. My technical specialties are the measurement, analysis and prediction of noise from industrial facilities – with a strong specialization in power plants of all kinds. I have been the principal acoustical designer on hundreds of power station projects worldwide.

Q. Have you ever testified as an expert witness before any court or administrative body? If so, what was the nature of your testimony?

A. Yes. For example, I have submitted both written and oral technical testimony before the Washington State Energy Facility Site Evaluation Council (EFSEC) with regard to the potential environmental impact of noise from a proposed 500 MW combined cycle power plant. My work on that project involved several field surveys of existing sound levels in the vicinity of the site and extensive noise modeling of the planned facility. Among other instances, I have also testified before the Public Service Commission of West Virginia with regard to the evaluation of possible noise impacts from a proposed 600 MW coal fired power plant near Morgantown, WV.

Q. What is the purpose of your testimony in this case?

A. The purpose of my testimony is to report my conclusions in connection with the noise aspects of the proposed Clear River Energy Center (CREC) in Burrillville, Rhode Island.

Q. What materials have you reviewed in this matter?

A. I have reviewed the 2015 noise level evaluation for the CREC prepared by Michael Theriault, Acoustics, Inc. in October of 2015 and submitted in support of the CREC application to the Rhode Island Energy Facility Siting Board (EFSB). In addition, I have reviewed the 2016 transient operation noise level evaluation for the CREC prepared by Michael Theriault, Acoustics, Inc. in March of 2016, which was submitted to the EFSB as a supplemental document in support of the CREC. I have also reviewed the data

responses submitted on behalf of the CREC in response to noise data requests that were submitted by the Town of Burrillville at my request.

Q. Please summarize your evaluation of the pros and cons of the proposed CREC within your area of expertise?

A. In terms of its pros and cons within the specific area of acoustics and the potential for community noise impacts during facility construction and operation, it is not possible for the CREC, or any similar plant, to have a positive noise impact on its surroundings. So there can be no pros. It is only a matter of limiting or eliminating potentially negative impacts.

In that regard, Invenergy has committed under oath to take every reasonable step to ensure that noise from the plant will meet the Town's demanding nighttime Ordinance noise limit of 43 dBA at the nearest residences at all times and during all normal operating modes, including start-up and shutdown, when noise from this particular type of plant can easily be dramatically louder than during steady-state operation. The CREC will use air cooled condensers (ACC's) to re-liquefy the spent steam from the low pressure (LP) steam turbine exhausts. Combined cycle plants have to go through a warm up period when they start-up that generally takes anywhere from 40 minutes to 2 hours. This is necessary to bring the steam quality up to a suitable superheat before it can be introduced into the steam turbine without causing rotor blade damage (i.e. pitting from entrained moisture). During this time high pressure hot reheat (HRH) and LP steam is bypassed directly into the vacuum of the cavernous main ACC steam duct – a process

that normally produces extremely high noise levels, and which typically occurs in the early morning or late evening hours just when additional noise is clearly undesirable. This potential for increased noise during start-up and shutdown has been heavily emphasized and publicized to the extent that I now believe Invenergy is giving the issue the robust attention it deserves and will, if the project proceeds, develop a design that successfully attenuates this noise. Despite the fact that excessive noise from steam turbine bypass is a common problem, it would be unfair to assume that the Applicant cannot adequately mitigate it. Consequently, during all normal modes of operation, noise from the facility is expected to be reasonably low in the community.

Q. Are you saying the CREC will be inaudible?

A. No, the plant will not be inaudible at all times, but rather its sound emissions are likely to be at a level that is normally regarded as benign and acceptable in most rural communities, even when the pre-existing environmental sound level is extremely low and offers no significant masking. However, given the overwhelming community opposition to this project, it would not be surprising if there were a greater than average sensitivity to plant noise, meaning that more complaints could occur than would otherwise be predicted by statistical averages.

Q. What do you recommend to protect the Town?

A. It is my professional opinion that the EFSB should require, as a condition of any permit, extensive field testing to conclusively demonstrate that the plant's sound emissions during all normal operating conditions, specifically including start-up and shutdown, are

in full compliance with the Town's effective (nighttime) noise limit of 43 dBA at the nearest residences in all directions. Full compliance with this overall noise limit at all times should be an explicit condition of the EFSB license, such that all violations are penalized by the EFSB with fines, cease and desist orders, and possible revocation of the operating license. It is also my professional opinion that Invenergy should be required to post a performance bond or other acceptable financial assurance for the benefit of the Town to ensure that these noise conditions are satisfied and that Town residents who may be adversely affected by any noise violations are compensated.

An important reason behind this recommendation for extremely firm noise restrictions on the CREC facility is that the nearest neighbors to the site have already been experiencing and complaining about inappropriately high noise levels from the Spectra Energy Burrillville Gas Compressor Station, located immediately adjacent to the proposed power plant site, for many years. Because the compressor station is federally regulated, its sound emissions need only meet a substantially higher guideline sound level of 55 dBA Ldn promulgated by the Federal Energy Regulatory Commission (FERC). Recent testing conducted by Spectra and reported to the Town indicates that even this level is not being met at some of the nearest residences. Consequently, the surrounding community is already highly sensitized to intrusive and objectionable noise and this situation must not be aggravated or intensified in any way by the addition of the proposed CREC facility. Meeting the relatively low effective Ordinance limit of 43 dBA or less at all adjacent homes should accomplish this goal.

Q. Have you looked at low frequency noise?

A. Yes. I do not anticipate any adverse community noise impacts specifically from low frequency noise from this plant. This is a trait common to all combined cycle plants irrespective of whether noise controls have been implemented for its suppression or not. Low frequency turbine exhaust noise, by far the principal source of low frequency noise at any gas turbine facility, is automatically attenuated at combined cycle plants as it passes through the boiler, or heat recovery steam generator (HRSG) - whether the plant operator desires it or not. Based on extensive field experience with combined cycle plants, I do not expect low frequency sound emissions from other plant sources, such as the air cooled condenser fans or HRSG casing, to be significant or problematic at the nearest residences because of the planned abatement to these and other sources, their generally moderate amplitude, even if untreated, and the substantial distances from the plant to the nearest homes.

Q. Have you looked at construction noise?

A. Yes. Beyond normal operation, there is a distinct likelihood of disturbance from plant construction noise, although this is not unusual and is true of virtually any similar project. The buffer distances from the site to the nearest residences in this case are fairly large relative to many other projects, but are certainly not large enough to render noise from on-site construction equipment and activities inaudible in the community. Additionally, significant noise from numerous large trucks delivering plant components to the site and from other project-related traffic will occur at homes along the roadways leading to the site, which certainly has the potential to cause some, largely unavoidable, disturbance.

Towards the end of construction, all of the steam piping must be cleared of weld slag and debris by flushing the pipes with high pressure steam until a metal target plate is no longer pitted by the impacts of solids. This process is referred to as steam blows. As the name implies, it can be a noisy process; however, special temporary silencers are normally rented by the construction company to minimize the noise impact on neighbors. Given the clearly unfavorable stance of the community towards the project, we would anticipate that Invenergy's Engineering, Procurement and Construction (EPC) contractor would want to use the best steam blow silencer they can get. Nevertheless, some fairly significant noise during this process, which might take a few weeks, can be expected and the use of state of the art temporary silencers during this process should be a condition of any EFSB permit.

Q. What about emergencies?

A. There is a possibility of intermittent community disturbance from noise generated during emergency trips, when high pressure steam must be suddenly vented to avoid damage to the plant. Again, this is not unusual or specific to this project, but simply an inherent negative at any power station. Although it is standard practice to employ silencers on these vents, the emitted sound levels are still rather loud compared to normal operations. Once the facility has been operational for some time, these events usually become quite rare, but it has been our experience that trips and steam releases are fairly frequent during the early phases of commissioning and initial operation before smooth and reliable operating conditions are established. The use of state of the art silencers on these safety relief vents should be a condition of any EFSB permit.

Q. What are your conclusions and recommendations?

A. There never are any pros with regard to a power plant's noise emissions and it is only a matter of how well the negatives are controlled. In this case, I believe Invenergy intends to take the appropriate steps to minimize facility noise and make it compatible with the surrounding environment by committing to the Town's nighttime noise Ordinance limit of 43 dBA or less at the nearest existing residences at all times and during all normal modes of operation. Beyond Invenergy's stated intentions, however, I believe full compliance with this overall noise limit during normal operating conditions should be an explicit condition of the EFSB license, such that all violations are penalized by the EFSB with fines, cease and desist orders, and possible revocation of the operating license. It is also my professional opinion that Invenergy should be required to post a performance bond or other acceptable financial assurance for the benefit of the Town to ensure that these noise conditions are satisfied and that Town residents who may be adversely affected by any noise violations are compensated.

Q. Are the opinions you have expressed in your testimony based upon your education, training, experience and the materials you have reviewed to prepare for this testimony, and are those opinions all based upon a reasonable degree of certainty or probability in your fields of expertise?

A. Yes.

Q. Does this conclude your testimony?

A. Yes.