Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

July 10, 2001

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Farzie Shelton
Manager of Environmental Affairs
Lakeland Electric
501 E. Lemon Street
Lakeland, Florida 33801-5079

Re: Request for Additional Information
DEP File No. 1050352-001-AC
Winston Peaking Station - Installation of 20 diesel engines

Dear Ms. Shelton:

The Department has received your response to our incompleteness letter of May 24, 2001, regarding an application for the installation of twenty diesel engines at Winston Peaking Station (new facility) in Polk County. The response was received on June 12, 2001. In order to continue processing your application, the Department will need the additional information requested below. Should your response to any of the below items require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form.

1. The operational setup for the Winston Peaking Station was given as either on-site or remote operation. If the setup is remote, where will the control systems be located?

2. The response indicates that the heat input limit of 1,084,245 MMBtu/yr for oil firing includes the heat input from peak load operation of 486,005 MMBtu/yr. Is this correct? By using the NO_x emission factor of 0.5 lb/MMBtu, the total NO_x emissions from the facility due to oil firing will be greater than 249 tpy (1,084,245 MMBtu/yr x 0.5 lb/MMBtu x 1/2000 ton/lb = 271 tpy). Please show the steps in arriving at 0.5 lb/MMBtu NO_x emission factor for oil firing at 100% load.

3. The heat input limit for natural gas at baseload conditions was calculated to be 2,581,900 MMBtu/yr. This includes the heat input due to diesel fuel for ignition purposes. Based on a NO_x emission factor of 0.2 lb/MMBtu for natural gas, the NO_x emissions will be greater than 249 tpy (2,581,900 MMBtu/yr x 0.2 lb/MMBtu x 1/2000 ton/lb = 258 tpy). Since the calculations showing NO_x emissions of 249 tpy in the response is based on the hours of operation and the lb/hr NO_x emissions provided by the manufacturer, the Department feels that the facility will stay below the 249 tpy threshold if the emission limits are based on the hours of operation rather than on heat input limits.

4. The supporting documentation submitted with the response shows emissions test results in Table 1 for a Caterpillar diesel generator. Please submit similar documentation for a GM/EMD 645E4 diesel engine.

5. The emissions testing report titled "Exhaust Emissions from a Dual-Fuel Locomotive" does not provide enough information in verifying the emissions numbers used in the application for different pollutants. Please resubmit additional information from the manufacturer that verifies the emission numbers used in the application.

The Department will resume processing your application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. Material changes to the application should also be accompanied by a new certification statement by the authorized representative or responsible official. Permit applicants are advised that Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days. If there are any questions, please call me at 850/921-9528.

Sincerely,

Syed Arif

Syed Arif, P.E. II
New Source Review Section

cc: B. Thomas, SWD
G. Worley, EPA
K. Kosky, Golder Associates
J. Spence, Polk County

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Farzie Shelton
Manager of Environmental Affairs
Lakeland Electric
501 E. Lemon St.
Lakeland, FL 33801-5079

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* Bonnie Brenna — B. Date of Delivery 7-12-01

C. Signature
X Bonnie Brenna ☐ Agent ☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)* 7000 0600 0026 4129 8313

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

7000 0600 0026 4129 8313

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here

Recipient's Name *(Please Print Clearly) (To be completed by mailer)*
Ms. Farzie Shelton
Street, Apt. No., or PO Box No.
501 E. Lemon St.
City, State, ZIP+4
lakeland, Fl 33801-5079

PS Form 3800, February 2000 See Reverse for Instructions

LAKELAND ELECTRIC

Farzie Shelton, chE; REM

Manager of Environmental Affairs

June 12, 2001

Mr. A.A. Linero, P.E., Administrator
New Source Review Section
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Attention: Mr. Syed Arif, P.E.

RE: Request for Additional Information
DEP File No. 10503052-001-AC
City Of Lakeland; Winston Peaking Project

Dear Syed:

Thank you for your letter of May 24, 2001 in reference to the above. We have prepared a response to your question (attached) signed and sealed by Mr. Ken Kosky of Golder Associates. Additionally, we are enclosing Testing Protocol-The emissions provided by the manufacturers. These tests were based on standard EPA test methods for the pollutant listed .

Also, as agreed in our meeting, we have prepared a draft permit for your review. This draft permit is in line with permit given to TECO for their peaking units by the Depart.

I hope with this letter we have satisfied your questions and concerns and we look forward to hear from you soon. If you should have any questions, please do not hesitate to contact me.

Sincerely,

Farzie Shelton

Enc.
cc: C. Holladay
B. Thomas, SWD
G. Worley, EPA

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:
   Roger D. Haar, City Manager
2. Owner/Authorized Representative or Responsible Official Mailing Address:
   Organization/Firm: **Lakeland Electric**
   Street Address: **501 East Lemon Street**
   City: **Lakeland** State: **FL** Zip Code: **33801-5079**
3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
   Telephone: (**863**) **834 - 6006** Fax: (**863**) **834 - 8402**
4. Owner/Authorized Representative or Responsible Official Statement:

   I, the undersigned, am the owner or authorized representative(check here [X], if so) or the responsible official (check here [ ], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

Signature 6.12.01 Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: **Kennard F. Kosky**
   Registration Number: **14996**
2. Professional Engineer Mailing Address:
   Organization/Firm: **Golder Associates Inc.**
   Street Address: **6241 NW 23rd Street, Suite 500**
   City: **Gainesville** State: **FL** Zip Code: **32653-1500**
3. Professional Engineer Telephone Numbers:
   Telephone: (**352**) **336 - 5600** Fax: (**352**) **336 - 6603**

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

June 11, 2001 0137545

Mr. A. A. Linero, P.E., Administrator
New Source Review Section
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Attention: Mr. Syed Arif, P.E.

RE: REQUEST FOR ADDITIONAL INFORMATION
DEP FILE NO. 10503052-001-AC
CITY OF LAKELAND; WINSTON PEAKING PROJECT

Dear Syed:

This correspondence presents information requested in the Department's letter dated May 24, 2001 regarding the Winston Peaking Station that will consist of 20 diesel engines. The additional information is presented in the same order as requested in the letter.

1. Facility and Stationary Source-The applicable regulations and various EPA guidance documents on this issue clearly suggest that the proposed Winston Peaking Station and the McIntosh Plant are a single facility. EPA's and the Department's rules define "stationary source" as "any building, structure, facility, or installation which emits or may emit any air pollutants subject to regulation. . . .". For regulatory purposes, a "building, structure, facility or installation" is defined in these rules as "all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) . . . ." Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "major group" (i.e., which have the same first two-digit code) as described in the Standard Industrial Classification Manual, 1972 . . . ." 40 CFR § 52.21(b)(6).

   Florida's rules are based on EPA rules and are almost identical in defining a stationary source. A "facility" is defined as "all of the emission units which are located on one or more contiguous or adjacent properties, and which are under the control of the same person (or persons under common control)." Rule 62-210.200(125), Florida Administrative Code (FAC).

   The proposed Winston Peaking Station and the McIntosh Plant are separate and distinct stationary sources. They are no more operational or functional related as separate power plant in any electric system owned and controlled by the same entity (e.g., Tampa Electric Company, Florida Power Corporation, Florida Power & Light Company, etc.). For purposes of evaluating whether the two facilities should be a single stationary source, the following facts are important:

- Each of the plants has separate, stand-alone operating facilities. The proposed Winston Peaking Station and McIntosh Plant will not be connected for common operation. There are separate associated facilities for independent operation.
- The plants are configured differently. The configurations are unique to the location of each facility and are based on the constraints of the infrastructure.
- The facilities are separately connected to the electric system. The McIntosh Plant is located in the eastern portion of City's electric system and the Winston Peaking Station is located on the western portion of the system. Indeed, the location of the Winston Peaking Station was selected based on its proximity to the City's largest industrial customer, Publix Supermarkets.
- The two sites are located 6.6 miles (10.5 kilometers) apart.

A number of decisions on this issue made by EPA and the Department over a period of years have been reviewed. There is not a single instance in which two facilities meeting the descriptions set forth above have been combined. While the Winston Peaking Station and McIntosh Plant are under common control, the sites are neither adjacent nor contiguous. The only instances where physically separated sites have been combined by EPA and the Department are those where there is some feature, such as a railroad line or a transmission line. Indeed, the City of Lakeland's Larsen and McIntosh Plants are located about miles apart, connected directly be natural gas pipeline and water facilities and have not been considered as the same stationary sources during three separate PSD reviews at the facilities and for Title V purposes.

While "contiguous" and "adjacent" are not defined in EPA or the Department's rules, EPA and supported by at least one court decision, have indicated an intention to use a sensible approach in applying the definition of "stationary source." It would seem appropriate to look at the commonly understood meaning of the words "contiguous" and "adjacent." "Contiguous" is defined as being "in contact", "touching" in close proximity without actually touching. "Adjacent" is defined as "lying near", "close", "neighboring", and "abutting". Indeed, contiguous and adjacent are acknowledged as synonyms. (Source: Webster's Encyclopedic Unabridged Dictionary of the English Language). These definitions certainly imply sites that are in very close proximity to one another, and certainly not separated by a distance of 6.6 miles.

2. Operational Setup-The Winston Peaking Station will be capable of either on-site or remote operation. Controls systems will be provided to monitor each engine and assure proper operation. Qualified operational staff from Lakeland Electric will be specifically trained in the operation and maintenance of the engines and control equipment. A regular scheduled maintenance program will be implemented to assure continued proper operation of the units.

3. Heat Input Limit for Peak Load-The emission and heat input for peak load are proportional. The difference between peak load heat input and emissions is based on a linear relationship of 20 percent higher for peak load than baseload. Therefore, the maximum heat input requested includes any heat input from peak load. For example if the engines operate at 876 hours (hr) at peak load the fuel use is 20 engines x 27.74 MMBtu/hr x 876 hr = 486,005 MMBtu (see Table 2-3). The NO_x emissions would be 121.8 tons per year (tons/yr) or 0.5 lb/MMBtu. As noted from the May 15th letter, the heat input of

1,084,245 MMBtu/yr corresponds to 249.1 tons/yr. This is also equivalent to 0.5 lb/MMBtu. (Note: some round off from spreadsheet calculations.)

4. Heat Input Calculation for Natural Gas at Baseload-The calculation of the total heat input limit requested for diesel fuel was provided in the letter dated May 15, 2001 from Mr. Kennard Kosky. For natural gas, it was assumed in the calculations that the heat rate would be different for each fuel. This assumption was not correct since the heat rate is the same when firing natural gas for both fuels. Table 2-5 has been revised to account for the same heat rate for both fuels when firing natural gas. As noted in the application, diesel fuel is used continuously when firing natural gas to allow ignition in the combustion process. The heat input when firing natural gas is the heat rate times the power output. For natural gas the heat input is 2.5 MW x 10,459 Btu (LHV)/kWhr x 1,000 kW/MW x 10^6/MM x 94% = 24.57865 MMBtu (LHV)/hr or 27.2823 MMBtu (HHV)/hr. For distillate oil the heat input is 2.5 MW x 10,459 Btu (LHV)/kWhr x 1,000 kW/MW x 10^6/MM x 6% = 1.56885 MMBtu (LHV)/hr or 1.66298 MMBtu (HHV)/hr. Natural gas usage is equivalent to 4,460 hr/yr at baseload operation based on lb/hr emissions provided by the manufacturer. The heat input for 20 units is: 20 engines x 27.2823 MMBtu/hr x 4,460 hr/yr = 2,433,581 MMBtu/yr for natural gas and 20 x 1.66298 MMBtu/hr x 4,460 hr = 148,338 MMBtu/yr for diesel fuel. The total is 2,433,581 MMBtu/yr + 148,338 MMBtu/yr = 2,581,919; 2,581,900 is requested. The NO_x emissions for this fuel use would be 4,460 hr x 5.58 lb/hr x 20 units x ton/2,000 lb = 249 tons/yr.

5. Emissions for Natural Gas Firing in Table 2-6 - The emissions were provided b the manufacturer and included 6% of the heat input from diesel fuel.

6. CO emissions for Different Loads-For diesel engines, the emissions of CO do not vary with load as gas turbines. The maximum emissions occur at full load. Moreover, the units will be installed with an oxidation catalyst to limit emissions of CO.

7. SCR NO_x Control Efficiency on Diesel Fuel Operation- The manufacturer has guaranteed that the SCR system can operate on diesel fuel.

8. Form of Ammonia-Aqueous ammonia with a maximum of 19 percent ammonia in water will be used.

9. Testing Protocol-The emissions provided were based on standard EPA test methods for the pollutant listed.

10. Diesel Fuel Usage when firing Natural Gas-The data provided by the manufacturer is based on 6% diesel fuel usage. Please note that AP-42 Section 3.4 provides a description of the proposed technology. As noted in the description diesel fuel in the 5 to 6 percent range is required to ignite the natural gas.

As noted from the Department's letter, the remaining questions are not required to evaluate the permit application. Brief responses follow.

1. While several sites were evaluated, the Winston site provided close proximity to a substation for interconnection with the City electrical grid and close proximity to Lakeland's largest industrial customer.

2. As noted from the information provided on the HIS control systems, the SCR and oxidation catalyst are integrated into a silencer and referred to as a $DeNO_x$ Silencer. As required by local applicable ordinances, Lakeland Electric will meet noise requirements.

3. Lakeland Electric will insure that neighbors in the vicinity of the Winston Peaking Station are not subject to impacts in excess of local requirements.

Please call if there are any questions on the technical information.

Sincerely,

Kennard F. Kosky, P.E.
Principal
Professional Engineer No. 14996

SEAL

cc: Farzie Shelton, City of Lakeland

P:\Projects\2001\0137545 City of Lakeland-Form RW4.1\061101.doc

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ], if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature

6/11/01
Date

(seal)

* Attach any exception to certification statement.

Table 2-5. Design Information and Stack Parameters for the Winston Peaking Station Project
20 GM EMD 20/645/E4B Diesel Engines, Natural Gas, 100 % Load *(REVISED 5/30/2001)*

Parameter	One Engine	Twenty Engines
Engine Performance		
Gross power output (MW)	2.5	50.0
NATURAL GAS (94% of Total Heat Input)		
Heat rate (Btu/kWh, LHV) - provided	10,459	10,459
(Btu/kWh, HHV) - calculated	11,609	11,609
Heat Input (MMBtu/hr, LHV)- calculated (94%)	24.58	491.6
(MMBtu/hr, HHV) - estimated	27.28	545.6
Fuel heating value (Btu/scf, LHV)- estimated	946	946
(Btu/scf, HHV)- provided	1,050	1,050
(HHV/LHV)	1.11	1.11
FUEL OIL (6% of Total Heat Input)		
Heat rate (Btu/kWh, LHV) - provided	10,459	10,459
(Btu/kWh, HHV) - calculated	11,087	11,087
Heat Input (MMBtu/hr, LHV) - calculated (6%)	1.57	31.4
(MMBtu/hr, HHV) - estimated	1.66	33.3
(HHV/LHV)	None	None
Fuel heating value (Btu/lb, LHV)- estimated	18,302	18,302
(Btu/lb, HHV)- provided	19,400	19,400
(HHV/LHV)	1.06	1.06
Engine Exhaust Flow		
Temperature (°F)	740	740
Volume flow (acfm)- provided	21,350	427,000
Fuel Usage		
Fuel usage (lb/hr)= [Natural Gas Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/scf (LHV) x 0.048 lb/scf)] and [Fuel OilHeat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))]; 6.83 lb/gal for oil assumed.		
Natural Gas Heat input (MMBtu/hr, LHV)	24.58	491.6
Natural Gas Heat content (Btu/scf, LHV)	946	946
Fuel Oil Heat input (MMBtu/hr, LHV)	1.57	31.4
Fuel Oil Heat content (Btu/lb, LHV)	18,302	18,302
Natural Gas Fuel usage (scf/hr)- calculated	25,983	519,663
Natural Gas Fuel usage (lb/hr)- calculated	1,247.2	24,943.8
Fuel Oil Fuel usage (lb/hr)- calculated	85.7	1,714
Fuel Oil Fuel usage (gal/hr)- calculated	12.6	251.0
Stack and Exit Gas Conditions		
Stack height (ft)	30	NA
Diameter (ft)	1.833	NA
Velocity (ft/sec)= Volume flow (acfm) / [((diameter)^2 /4) x 3.14159] / 60 sec/min		
Volume flow (acfm)	21,350	NA
Diameter (ft)	1.8	NA
Velocity (ft/sec)- calculated	134.8	NA
Velocity (m/sec)- calculated	41.1	NA

Source: Genertek, 2001.
Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2

FACSIMILE

GENERTEK INTERNATIONAL CORP.
1250 Hobbs Road
Auburndale, Florida 33823

Date	4/5/01
Number of pages including cover sheet	3

From:	**John B. Manning**
Phone	(863) 965-1907
Fax Phone	(863) 965-1181

URGENT !

To:	**Lakeland Electric**
Attn:	**Gary Lawrence**
cc:	
Phone	(863)834-6522
Fax Phone	(863)834-6488
CC:	

REMARKS:

☒ Urgent ☒ For your review ☐ Reply ASAP ☐ Please comment

Dear Gary,

Please find the following information for yor review.

Best regards,

John B. Manning
VP/GM Genertek International, Corp

GENERTEK
INTERNATIONAL CORPORATION

POWER GENERATION FOR THE 21ST CENTURY

June 5th, 2001

LAKELAND ELECTRIC

501 E. Lemon St.
Lakeland, Florida 33801

Attn: Gary T. Lawrence, Manager of rates Division
Ref: Emissions Testing Information

Dear Gary,

Per your request, in response to question No. 7 of the letter sent to Ms. Farzie Shelton, by the DE,P please find the following information for your review.

One of the comments made by the DEP in item No. 7 indicates that the HIS brochure claims that the equipment will reduce NOx on natural gas only. However, we believe this to be a possible oversight on their part as this is not correct. I have included a copy of a promotional piece from HIS that highlights that the equipment reduces on diesel fired equipment.

The emissions test result provided shows a reduction in NOx of 94% on diesel. As you know we are providing the same equipment with an 89% reduction.

I should have the test criteria info asked about in question number 9 today, and will send it to as soon as it arrives.

The hard copies of the test results of the HIS equipment was Fed-Ex'ed to us yesterday and should be here this morning and I will send them to you just a soon as it arrives.

Should you have any further question, please feel free to contact me.

Best regards,

John B. Manning
VP/GM Genertek International Corporation

HIS Emissions Reduction Systems

FAXED
5/31/01 4:10 P.M

6/04/01
JOHN L MANNING 6/01/01

FAX TRANSMITTAL

Date: May 31, 2001 **Fax:** 863-965-1181

To: Mr. Brian Papp

Company: Genertek

From: Harold L. Harris

Total No. of Pages (including this one): 1

****

Brian:

This will supplement are fax transmittal on May 30, 2001, a typical compliance test.

Anticipated cleaning maintenance interval is six months depending on fuel quality and the amount of fuel and oil carry over.

Total solution rate for injection in the exhaust pipe is 17.35 gph.

Let me know when you need more information.

Sincerely,

Harold L. Harris

HLH:tas

9837 Whitham Drive • Houston, Texas 77095 • 281-463-8883
P.O. Box 1639 • Cypress, Texas 77410 • Fax 281-463-8951

HIS Emissions Reduction Systems

Selective Catalytic Reduction System

High Efficiency NOx Conversion
Low Ammonia Slip
Extremely Low Maintenance

"Lean Burn" two-cycle and four-cycle natural gas fueled engines and liquid fueled diesel engines operate with exhaust oxygen greater than 8% by volume. *HIS* has developed the DeNOx Silencer for Selective Catalytic Reduction (*SCR*) service. This *SCR* process employs ammonia injection with a catalyst formulated specifically for reduction of NOx and CO to required levels.

The selection of catalyst is determined by operating exhaust gas mass flow, temperature and composition. Each engine is evaluated for untreated emissions levels, and the usage of each engine is considered in the design of the entire *SCR* System. Heat recovery and steam production are also available as optional equipment. The *HIS* DeNOx Silencer design meets all installation requirements. Direct replacement of the existing silencer minimizes retrofit costs and simplifies piping in new engine installations.

The outstanding feature of this catalyst application (and the others mentioned here) is that there is virtually no slip of ammonia to atmosphere. At operating conditions (temperature), the ammonia will be consumed in the catalyst. Hence, elaborate ammonia control and monitoring are not necessary.

Ammonia slip to atmosphere is limited to 3ppm to 5ppm. The proper reaction between the injected ammonia and the exhaust gases will only produce high conversion rates if the reaction components make direct contact with the vast catalyst surface area. Catalyst substrate is of a honeycomb structure, coated with the base vanadium and other reactive elements which are used in order to provide the most active surface areas, and ensure a low pressure drop and lowest possible operating costs. The active catalyst elements are fitted to a stainless steel support by means of a fusion bonded method in the manufacturing process.

To achieve the best possible reduction of emissions, it is extremely important that a uniform reaction temperature, and a constant residence time of the exhaust on the catalyst, be maintained. The pulsation damping effect of the DeNOx Silencer provides this stable atmosphere.

Ammonia, in either aqueous or anhydrous form, may be used in the injection process. Aqueous ammonia must be injected in a distilled water stream. Anhydrous ammonia can be mixed with air or steam to reach exhaust flow or vaporized directly in the exhaust stream. The aqua ammonia solution of 75% deionized water to 25% ammonia keeps the solution from the hazardous material handling requirements.

NOx reduction by more than 80% has been experienced over a two year period of continuous maintenance free operation on a natural gas fuel spark ignited two-cycle engine. Carbon monoxide reduction is greater that 80% and ammonia slip to atmosphere has never exceeded 10ppm when NO_x reduction is at the level of 75ppm. This outstanding performance can be duplicated for your emissions reduction requirements.

We would be happy to discuss this equipment with you at any time.

9837 Whithorn Drive • Houston, Texas 77095 • 281-463-8883
P.O. Box 1590 • Cypress, Texas 77410 • Fax 281-463-8951

Reduction
94% reduction
on diesel

TABLE 1

BOEHRINGER INGELHEIM PHARMACEUTICALS, INC.

CATERPILLAR DIESEL GENERATOR SET ----------1250KW

EMISSIONS TEST RESULTS BASED UPON JUNE 11, 1996 SERIES

PRE CATALYST

1100 ppm

600 ppm

POST CATALYST

PARAMETER	ALLOWABLE EMISSIONS lb/hr	lb/mmBtu	ug/m³	TPY	ppm	ACTUAL EMISSIONS lb/hr	lb/mmBtu	ug/m³	TPY	PERMIT STATUS lb/hr	lb/mmBtu	ppm	TPY
TSP	0.471	0.059	NPR	0.235	-	1.077	0.087	NPR	0.538	FAIL	FAIL	NPR	FAIL
NOx	3.393	0.25	NPR	1.549	(55)	1.569	0.127	NPR	0.784	PASS	PASS	NPR	PASS
CO	0.942	0.076	NPR	0.471	5	0.088	0.007	NPR	0.044	PASS	PASS	NPR	PASS
H_2SO_4	0.044	0.004	1150.08	0.022	12.2	0.827	0.057	49760	0.314	FAIL	FAIL	FAIL	FAIL
NH_3	0.354	0.029	7585	0.162	1.6	0.014	0.001	1131	0.007	PASS	PASS	PASS	PASS

FACSIMILE

GENERTEK INTERNATIONAL CORP.
1250 Hobbs Road
Auburndale, Florida 33823

Date	4/5/01
Number of pages including cover sheet	1

From:	**John B. Manning**
Phone	(863) 965-1907
Fax Phone	(863) 965-1181

URGENT !

To:	**Lakeland Electric**
Attn:	**Gary Lawrence**
cc:	
Phone	(863)834-6522
Fax Phone	(863)834-6488
CC:	

REMARKS:

☒ Urgent ☒ For your review ☐ Reply ASAP ☐ Please comment

Dear Gary,

Please find the following information concerning the emissions testing done on EMD engines for yor review.

I this is not sufficient then please let me know.

This is the most comprehensive testing performed on the dual fuel engine system for the EMD engines installed in locomotives (which are actually variable speed generator sets). The testing included load cycles of the engine at various RPM's, and at less than full loads, for which the engine is at its's highest efficiency and the cleanest burning. As a result, the engine imissions improve greatly at full load and a constant maximum RPM of 900 for the genset application.

As mentioned, the latest test are being conducted by an independent testing company as we speak and should be compited by Friday. We will provide the full test report upon completion.

Best regards,

John B. Manning

VP/GM Genertek International, Corp

EXHAUST EMISSIONS FROM A DUAL-FUEL LOCOMOTIVE

By

Steven G. Fritz

FINAL REPORT

Prepared for

Burlington Northern Railroad
2660 Continental Plaza
777 Main Street
Ft. Worth, Texas

March 1992

Charles T. Hare, Director
Department of Emissions Research
Automotive Products and
Emissions Research Division

FOREWORD

This project was performed for the Burlington Northern Railroad by the Department of Emissions Research, Automotive Products and Emissions Research Division, Southwest Research Institute (SwRI). SwRI Proposal No. 08-10770(b) dated July 8, 1991 titled "Emission Testing of A Dual-Fuel Locomotive" outlined the proposed test work. Field test work was performed in late October 1991.

The sponsor and technical representative was Mr. Leslie Olson, Manager of Energy Research and Development for Burlington Northern Railroad (BN). Project funding was provided to SwRI by BN. The Principal Investigator and Project Manager for SwRI was Steven G. Fritz, Senior Research Engineer in the Department of Emissions Research. Key SwRI technical personnel were Eddie Grinstead, Research Technologist, and Larry Servin, Technician in the Department of Emissions Research. The SwRI technical monitor for this work was Terry L. Ullman, Manager, Heavy-Duty Control Methodology.

In addition to the SwRI team, several others played key roles in the success of the project. Paul Jensen, Scott Jensen, Mitch Gillispie and Rob McClain from Energy Conversions Incorporated (ECI) in Tacoma, Washington, performed the dual-fuel conversion for BN and worked tirelessly in preparing and operating the locomotive during emissions testing. At the Coast Engine and Equipment Company (CEECO) test site in Tacoma, Ted Bird and Dale Stanley were instrumental in coordinating the facility requirements of the emission tests.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D)

APPENDICES

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The Department of Emissions Research of Southwest Research Institute, under contract with the Burlington Northern Railroad, measured the exhaust emissions from a dual-fuel locomotive (BN 7890) at a site in Tacoma, Washington. This prototype locomotive uses diesel fuel pilot-injection as an ignition source for timed injection of natural gas fuel in a modified EMD 16-645 E3B diesel engine. Natural gas was supplied to the locomotive as a gas, but stored in a tender car as refrigerated liquid methane (RLM). Emissions measurements were performed in late October 1991 after the successful conclusion of a 500-hour durability test.

This report contains steady-state exhaust emission test results for total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO_2), oxides of nitrogen (NO_x), and particulate (PM). Sulfur dioxide (SO_2) emissions were computed based on diesel fuel sulfur content. The following Table summarizes the composite EMD line-haul duty-cycle weighted emission test results of the dual-fuel locomotive operating in both the dual-fuel mode and the diesel-only mode (100 percent diesel fuel). In addition, composite emissions data from an EMD 12-645E3B diesel engine tested at SwRI for the AAR are presented for comparison to an unmodified engine.

SUMMARY OF COMPOSITE EXHAUST EMISSIONS AND THERMAL EFFICIENCY FOR THE BN 7890 DUAL-FUEL LOCOMOTIVE

EMD Line-Haul Duty-Cycle Weighted Emissions (g/hp-hr)	BN Experimental Dual-Fuel Locomotive	BN Dual-Fuel Locomotive on 100% Diesel Fuel	AAR Unmodified EMD 645E3B Engine
Total Hydrocarbons (THC)	7.7	0.6	0.3
Non-Methane Hydrocarbons (NMHC)	0.9	0.6	0.3
Carbon Monoxide (CO)	10.0	1.4	0.7
Oxides of Nitrogen (NO_x)	4.2	8.4	11.4
Particulate (PM)	0.33	0.49	0.27
Carbon Dioxide (CO_2)	386	427	416
Sulfur Dioxide (SO_2)	0.24[a]	1.50[a]	1.46[a]
Brake Thermal Efficiency (%)	33.7	37.6	37.4

Note: a - SO_2 values computed using 0.43% Sulfur diesel fuel.

Observations of these duty-cycle weighted data include:

- The BN dual-fuel locomotive had significantly lower composite NO_x emission levels in both the dual-fuel mode and the diesel mode compared to an unmodified EMD 645E3B diesel engine.
- In both modes of operation, the dual-fuel locomotive had higher composite particulate emissions compared to an unmodified diesel engine. However, the dual-fuel mode composite particulate level was skewed largely by a significantly higher particulate emission rate at idle, which was mostly unburned diesel fuel. The particulate levels at most power-producing Notch positions were notably lower with the dual-fuel locomotive compared to an unmodified EMD 645E3B diesel engine.
- Composite particulate emissions for the dual-fuel engine operating in the diesel mode were twice those of an unmodified EMD 645E3B diesel engine.
- During dual-fuel operation, emissions of both total and non-methane hydrocarbons and carbon monoxide were significantly increased.
- In the dual-fuel mode, engine thermal efficiency was approximately 11 percent lower than the baseline unmodified EMD 645E3B diesel engine.
- The thermal efficiency for the dual-fuel engine operating in the diesel mode is similar to that of the unmodified EMD 645E3B.
- Composite carbon monoxide emission levels in the dual-fuel mode are higher than would generally be expected with a lean-burn gas-fueled engine. The higher CO level indicates that perhaps the trapped air/fuel ratio was generally rich of stoichiometric, or that there may have been some rich combustion regions in the combustion chamber resulting from unusual in-cylinder mixing processes.

Based on the dual-fuel emissions testing performed in this study, the following **recommendations** are made:

1. BN should consider investigating the use of a catalytic converter engineered specifically for the dual-fuel locomotive conversion using existing catalyst technology. An oxidizing catalytic converter would likely offer significant reductions in CO emissions, with notable reductions in HC and particulate.
2. Idle and light-load particulate emissions provide the most opportunity for reductions because most of the particulate from the modified dual-fuel engine at these operating conditions is unburned diesel fuel.
3. Although not specifically studied in this work, the high cold-start smoke levels observed could jeopardize public perception of the overall emissions benefits of the dual-fuel conversion. BN should consider starting aids and/or engine jacket water and lubricating oil system heaters (either electrical or natural gas powered) to minimize the cold-start smoke emissions.

II. TECHNICAL APPROACH

A. Engine Power Measurement

All engine power measurements were performed by ECI, and the results were provided to SwRI for computing brake specific emissions. The auxiliary generator output was assumed to be constant at all notches. The traction motor blower, cooling fans, and inertial blower power requirements were derated as the cube of the ratio of engine speed and the Notch 8 (rated) engine speed (900 rpm). Actual power consumption of these components is also dependent on ambient air density, so the power consumption was corrected to AAR standard conditions (60°F and 28.86 in. Hg). The locomotive air compressor was always considered to be unloaded. The unloaded air compressor and water pump power consumption were derated linearly with engine speed. Main AR10 alternator output was measured directly and an EMD alternator efficiency factor was applied to voltage and current measurements. Engine power information supplied to SwRI by ECI is included as Appendix A.

B. Fuel Consumption Measurement

Both diesel and natural gas consumption rates were also measured by ECI, and the results reported to SwRI for use in computing the exhaust emission rates on a mass basis. Diesel fuel mass flow rate was measured using one of two external fuel tanks suspended from load cells. These systems are shown next to the locomotive in Figure 1. The large 500-gallon tank was used when operating the locomotive on 100 percent diesel fuel in the "diesel mode" at the higher Notch positions when the diesel fuel consumption was relatively high, and the 55-gallon tank was used when testing in the dual-fuel mode or at the lower Notch positions which only consumed diesel fuel. Temperature compensated load cells were used in conjunction with an integrating device that would display total mass as well as the change in mass over a given time. This system was typically used to monitor the diesel fuel consumption over a 30-minute period.

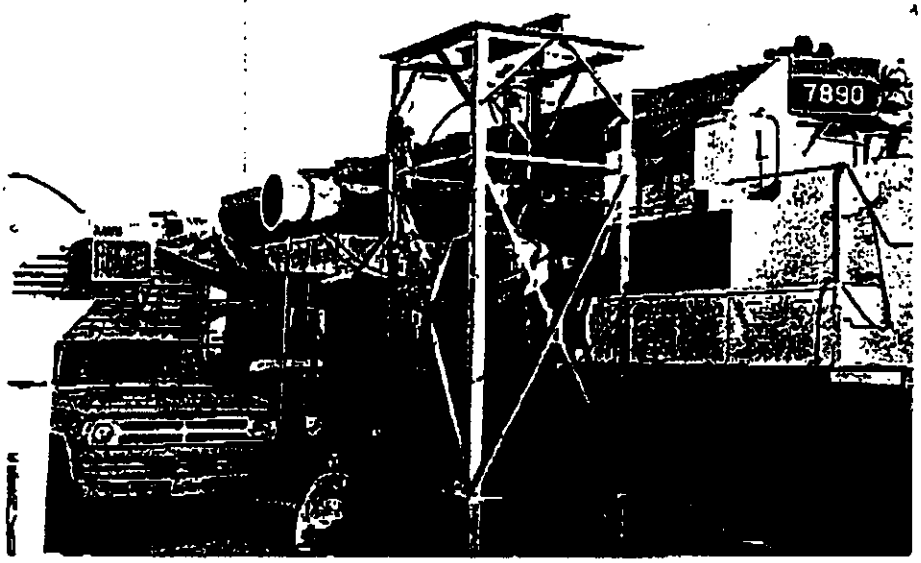

FIGURE 1. EXTERNAL FUEL TANKS USED FOR DIESEL FUEL FLOW MEASUREMENT

Natural gas flow was measured by ECI using orifice plates in the gas supply system. Orifice plate pressure differential was measured along with gas static pressure and temperature during each test point to compute the natural gas mass flow rate. A summary of the measured locomotive fuel rates supplied to SwRI by ECI is given in Appendix B.

C. Engine Air Flow Measurement

Engine air flow was measured using a pitot tube type air flow sensor manufactured by Brandt Instruments. The Brandt B-NZP1031-20"-1 sensor had a maximum air flow measurement capacity of 12,000 scfm and has a stated turndown ratio of 34:1 with an accuracy of ±0.5 percent. This instrument was installed on the locomotive as shown in Figures 2 and 3. The Brandt air flow meter was mounted to a air duct system fabricated by ECI, which was in turn mounted to the face of the locomotive baggy-type air filter housing. This configuration allowed for the baggy air filters to remain in place during emissions testing. The air supply ducting was modular so that it could be installed and removed in pieces. All seams were sealed with RTV and then taped. The ducting entered the locomotive car body through the air filter compartment access door. With this door open, the locomotive inertial air filters were not functional. Brandt flowmeter pressure differential, along with ambient air temperature, barometric pressure, and humidity were recorded at each test point by SwRI, and used to compute the engine intake air volumetric and mass flow rates. Appendix C contains the measured engine intake air flow data recorded during emissions testing.

D. Test Fuels

Tests on the dual-fuel locomotive were performed using ASTM 2-D diesel fuel. A sample of the diesel fuel was analyzed by SwRI and the results are given in Table 1. A sample of the natural gas also was taken from the tender car and analyzed by Northwest Natural Gas. Table 2 gives the natural gas composition as reported to SwRI. These properties were used in computing emission results.

When computing hydrocarbon emissions and emissions based fuel/air ratios, the hydrogen to carbon ratio (H/C) of the fuel must be known or estimated. Because diesel and natural gas fuel flow rates were measured for each test, and the hydrogen and carbon mass fractions for both the diesel fuel and the natural gas were known, the H/C ratio was calculated and used in the mass emission rate computations for each test point.

E. Exhaust Emissions Test Procedure

No "standard" emission measurement procedures exist for locomotive engines in the U.S. However, commonly accepted emission measurement practices and procedures are currently being formalized by the AAR with cooperation of SwRI and the locomotive engine industry. [2] These test procedures have been developed using proven EPA procedures for steady-state measurements of gaseous and particulate exhaust emissions. [3] In addition, it is expected that the final accepted AAR test procedures will be essentially equivalent to those being developed by ISO [4], which includes procedures and weighting factors for locomotive engines. For this work, the measurement procedures used conform to those under development for the AAR. [2]

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

Golder Associates

June 11, 2001

0137545
RECEIVED
JUN 12 2001
BUREAU OF AIR REGULATION

Mr. A. A. Linero, P.E., Administrator
New Source Review Section
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Attention: Mr. Syed Arif, P.E.

RE: REQUEST FOR ADDITIONAL INFORMATION
DEP FILE NO. 10503052-001-AC
CITY OF LAKELAND; WINSTON PEAKING PROJECT

Dear Syed:

This correspondence presents information requested in the Department's letter dated May 24, 2001 regarding the Winston Peaking Station that will consist of 20 diesel engines. The additional information is presented in the same order as requested in the letter.

1. Facility and Stationary Source-The applicable regulations and various EPA guidance documents on this issue clearly suggest that the proposed Winston Peaking Station and the McIntosh Plant are a single facility. EPA's and the Department's rules define "stationary source" as "any building, structure, facility, or installation which emits or may emit any air pollutants subject to regulation. . . .". For regulatory purposes, a "building, structure, facility or installation" is defined in these rules as "all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) . . . ." Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "major group" (i.e., which have the same first two-digit code) as described in the Standard Industrial Classification Manual, 1972 . . . ." 40 CFR § 52.21(b)(6).

   Florida's rules are based on EPA rules and are almost identical in defining a stationary source. A "facility" is defined as "all of the emission units which are located on one or more contiguous or adjacent properties, and which are under the control of the same person (or persons under common control)." Rule 62-210.200(125), Florida Administrative Code (FAC).

   The proposed Winston Peaking Station and the McIntosh Plant are separate and distinct stationary sources. They are no more operational or functional related as separate power plant in any electric system owned and controlled by the same entity (e.g., Tampa Electric Company, Florida Power Corporation, Florida Power & Light Company, etc.). For purposes of evaluating whether the two facilities should be a single stationary source, the following facts are important:

- Each of the plants has separate, stand-alone operating facilities. The proposed Winston Peaking Station and McIntosh Plant will not be connected for common operation. There are separate associated facilities for independent operation.
- The plants are configured differently. The configurations are unique to the location of each facility and are based on the constraints of the infrastructure.
- The facilities are separately connected to the electric system. The McIntosh Plant is located in the eastern portion of City's electric system and the Winston Peaking Station is located on the western portion of the system. Indeed, the location of the Winston Peaking Station was selected based on its proximity to the City's largest industrial customer, Publix Supermarkets.
- The two sites are located 6.6 miles (10.5 kilometers) apart.

A number of decisions on this issue made by EPA and the Department over a period of years have been reviewed. There is not a single instance in which two facilities meeting the descriptions set forth above have been combined. While the Winston Peaking Station and McIntosh Plant are under common control, the sites are neither adjacent nor contiguous. The only instances where physically separated sites have been combined by EPA and the Department are those where there is some feature, such as a railroad line or a transmission line. Indeed, the City of Lakeland's Larsen and McIntosh Plants are located about miles apart, connected directly be natural gas pipeline and water facilities and have not been considered as the same stationary sources during three separate PSD reviews at the facilities and for Title V purposes.

While "contiguous" and "adjacent" are not defined in EPA or the Department's rules, EPA and supported by at least one court decision, have indicated an intention to use a sensible approach in applying the definition of "stationary source." It would seem appropriate to look at the commonly understood meaning of the words "contiguous" and "adjacent." "Contiguous" is defined as being "in contact", "touching" in close proximity without actually touching. "Adjacent" is defined as "lying near", "close", "neighboring", and "abutting". Indeed, contiguous and adjacent are acknowledged as synonyms. (Source: Webster's Encyclopedic Unabridged Dictionary of the English Language). These definitions certainly imply sites that are in very close proximity to one another, and certainly not separated by a distance of 6.6 miles.

2. Operational Setup-The Winston Peaking Station will be capable of either on-site or remote operation. Controls systems will be provided to monitor each engine and assure proper operation. Qualified operational staff from Lakeland Electric will be specifically trained in the operation and maintenance of the engines and control equipment. A regular scheduled maintenance program will be implemented to assure continued proper operation of the units.

3. Heat Input Limit for Peak Load-The emission and heat input for peak load are proportional. The difference between peak load heat input and emissions is based on a linear relationship of 20 percent higher for peak load than baseload. Therefore, the maximum heat input requested includes any heat input from peak load. For example if the engines operate at 876 hours (hr) at peak load the fuel use is 20 engines x 27.74 MMBtu/hr x 876 hr = 486,005 MMBtu (see Table 2-3). The NO_x emissions would be 121.8 tons per year (tons/yr) or 0.5 lb/MMBtu. As noted from the May 15th letter, the heat input of

1,084,245 MMBtu/yr corresponds to 249.1 tons/yr. This is also equivalent to 0.5 lb/MMBtu. (Note: some round off from spreadsheet calculations.)

4. Heat Input Calculation for Natural Gas at Baseload-The calculation of the total heat input limit requested for diesel fuel was provided in the letter dated May 15, 2001 from Mr. Kennard Kosky. For natural gas, it was assumed in the calculations that the heat rate would be different for each fuel. This assumption was not correct since the heat rate is the same when firing natural gas for both fuels. Table 2-5 has been revised to account for the same heat rate for both fuels when firing natural gas. As noted in the application, diesel fuel is used continuously when firing natural gas to allow ignition in the combustion process. The heat input when firing natural gas is the heat rate times the power output. For natural gas the heat input is 2.5 MW x 10,459 Btu (LHV)/kWhr x 1,000 kW/MW x 10^6/MM x 94% = 24.57865 MMBtu (LHV)/hr or 27.2823 MMBtu (HHV)/hr. For distillate oil the heat input is 2.5 MW x 10,459 Btu (LHV)/kWhr x 1,000 kW/MW x 10^6/MM x 6% = 1.56885 MMBtu (LHV)/hr or 1.66298 MMBtu (HHV)/hr. Natural gas usage is equivalent to 4,460 hr/yr at baseload operation based on lb/hr emissions provided by the manufacturer. The heat input for 20 units is: 20 engines x 27.2823 MMBtu/hr x 4,460 hr/yr = 2,433,581 MMBtu/yr for natural gas and 20 x 1.66298 MMBtu/hr x 4,460 hr = 148,338 MMBtu/yr for diesel fuel. The total is 2,433,581 MMBtu/yr + 148,338 MMBtu/yr = 2,581,919; 2,581,900 is requested. The NO_x emissions for this fuel use would be 4,460 hr x 5.58 lb/hr x 20 units x ton/2,000 lb = 249 tons/yr.

5. Emissions for Natural Gas Firing in Table 2-6 - The emissions were provided b the manufacturer and included 6% of the heat input from diesel fuel.

6. CO emissions for Different Loads-For diesel engines, the emissions of CO do not vary with load as gas turbines. The maximum emissions occur at full load. Moreover, the units will be installed with an oxidation catalyst to limit emissions of CO.

7. SCR NO_x Control Efficiency on Diesel Fuel Operation- The manufacturer has guaranteed that the SCR system can operate on diesel fuel.

8. Form of Ammonia-Aqueous ammonia with a maximum of 19 percent ammonia in water will be used.

9. Testing Protocol-The emissions provided were based on standard EPA test methods for the pollutant listed.

10. Diesel Fuel Usage when firing Natural Gas-The data provided by the manufacturer is based on 6% diesel fuel usage. Please note that AP-42 Section 3.4 provides a description of the proposed technology. As noted in the description diesel fuel in the 5 to 6 percent range is required to ignite the natural gas.

As noted from the Department's letter, the remaining questions are not required to evaluate the permit application. Brief responses follow.

1. While several sites were evaluated, the Winston site provided close proximity to a substation for interconnection with the City electrical grid and close proximity to Lakeland's largest industrial customer.

2. As noted from the information provided on the HIS control systems, the SCR and oxidation catalyst are integrated into a silencer and referred to as a $DeNO_x$ Silencer. As required by local applicable ordinances, Lakeland Electric will meet noise requirements.

3. Lakeland Electric will insure that neighbors in the vicinity of the Winston Peaking Station are not subject to impacts in excess of local requirements.

Please call if there are any questions on the technical information.

Sincerely,

Kennard F. Kosky, P.E.
Principal
Professional Engineer No. 14996

SEAL

cc: Farzie Shelton, City of Lakeland

P:\Projects\2001\0137545 City of Lakeland-Form R\4.1\061101.doc

C. Holladay
B. Thomas, SWD
J. Worley, EPA

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ], if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature

6/11/01
Date

(seal)

* Attach any exception to certification statement.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:
   Roger D. Harr, City Manager
2. Owner/Authorized Representative or Responsible Official Mailing Address:
   Organization/Firm: **Lakeland Electric**
   Street Address: **501 East Lemon Street**
   City: **Lakeland** State: **FL** Zip Code: **33801-5079**
3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
   Telephone: (**863**) **834 - 6006** Fax: (**863**) **834 - 8402**
4. Owner/Authorized Representative or Responsible Official Statement:

   I, the undersigned, am the owner or authorized representative(check here [X], if so) or the responsible official (check here [ ], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

   _____ _____

   Signature Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: **Kennard F. Kosky**
   Registration Number: **14996**
2. Professional Engineer Mailing Address:
   Organization/Firm: **Golder Associates Inc.**
   Street Address: **6241 NW 23rd Street, Suite 500**
   City: **Gainesville** State: **FL** Zip Code: **32653-1500**
3. Professional Engineer Telephone Numbers:
   Telephone: (**352**) **336 - 5600** Fax: (**352**) **336 - 6603**

Table 2-5. Design Information and Stack Parameters for the Winston Peaking Station Project
20 GM EMD 20/645/E4B Diesel Engines, Natural Gas, 100 % Load *(REVISED 5/30/2001)*

Parameter	One Engine	Twenty Engines
Engine Performance		
Gross power output (MW)	2.5	50.0
NATURAL GAS (94% of Total Heat Input)		
Heat rate (Btu/kWh, LHV) - provided	10,459	10,459
(Btu/kWh, HHV) - calculated	11,609	11,609
Heat Input (MMBtu/hr, LHV)- calculated (94%)	24.58	491.6
(MMBtu/hr, HHV) - estimated	27.28	545.6
Fuel heating value (Btu/scf, LHV)- estimated	946	946
(Btu/scf, HHV)- provided	1,050	1,050
(HHV/LHV)	1.11	1.11
FUEL OIL (6% of Total Heat Input)		
Heat rate (Btu/kWh, LHV) - provided	10,459	10,459
(Btu/kWh, HHV) - calculated	11,087	11,087
Heat Input (MMBtu/hr, LHV) - calculated (6%)	1.57	31.4
(MMBtu/hr, HHV) - estimated	1.66	33.3
(HHV/LHV)	None	None
Fuel heating value (Btu/lb, LHV)- estimated	18,302	18,302
(Btu/lb, HHV)- provided	19,400	19,400
(HHV/LHV)	1.06	1.06
Engine Exhaust Flow		
Temperature (°F)	740	740
Volume flow (acfm)- provided	21,350	427,000
Fuel Usage		
Fuel usage (lb/hr)= [Natural Gas Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/scf (LHV) x 0.048 lb/scf)] and [Fuel OilHeat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))]; 6.83 lb/gal for oil assumed.		
Natural Gas Heat input (MMBtu/hr, LHV)	24.58	491.6
Natural Gas Heat content (Btu/scf, LHV)	946	946
Fuel Oil Heat input (MMBtu/hr, LHV)	1.57	31.4
Fuel Oil Heat content (Btu/lb, LHV)	18,302	18,302
Natural Gas Fuel usage (scf/hr)- calculated	25,983	519,663
Natural Gas Fuel usage (lb/hr)- calculated	1,247.2	24,943.8
Fuel Oil Fuel usage (lb/hr)- calculated	85.7	1,714
Fuel Oil Fuel usage (gal/hr)- calculated	12.6	251.0
Stack and Exit Gas Conditions		
Stack height (ft)	30	NA
Diameter (ft)	1.833	NA
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)^2 /4) x 3.14159] / 60 sec/min		
Volume flow (acfm)	21,350	NA
Diameter (ft)	1.8	NA
Velocity (ft/sec)- calculated	134.8	NA
Velocity (m/sec)- calculated	41.1	NA

Source: Genertek, 2001.
Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

May 24, 2001

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Farzie Shelton
Manager of Environmental Affairs
Lakeland Electric
501 E. Lemon Street
Lakeland, Florida 33801-5079

Re: Request for Additional Information
DEP File No. 1050352-001-AC
Winston Peaking Station - Installation of 20 diesel engines

Dear Ms. Shelton:

On May 14, 2001 the Department received your application for the installation of twenty diesel engines at Winston Peaking Station (new facility) in Polk County. The application is incomplete. In order to continue processing your application, the Department will need the additional information requested below. Should your response to any of the below items require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form.

1. Rule 62-210.200(126), F.A.C. defines "Facility" as all of the emissions units which are located on one or more contiguous or adjacent properties, and which are under the control of the same person (or persons under common control). Part 70 defines a major source, or any group of stationary sources that are located on one or more contiguous or *adjacent* properties, and are under common control of the same person (or persons under common control), belonging to a single major industrial grouping [Standard Industrial Classification code]. Based on this definition, please provide your rationale for not considering this project an integral part of McIntosh facility. The meeting of May 14 indicated that the shortcomings of Westinghouse 501G unit at McIntosh would be supplemented by the diesel engines.
2. Please explain the operational setup for the peaking station. Will there be a control room for operating the diesel engines onsite. Will there be additional personnel hired to operate this facility.
3. The heat input limits of 1,084,000 MMBtu/yr for oil firing does not include the heat input due to peak load operation. Please recalculate the heat input limit if the diesel engines will operate twenty percent of the time under peak load conditions. Also, calculate the NO_x emissions generated under this scenario. The letter of May 15 shows the calculations for heat input and NO_x emissions only under baseload conditions.
4. Please calculate the heat input based on natural gas firing under baseload conditions.
5. Table 2-6 indicates maximum emissions based on natural gas firing under baseload conditions. Does the emissions incorporate diesel fuel emissions used for ignition.
6. Please provide data of CO emissions at different loads. What are the maximum emissions that can be expected for CO and at what load?

7. Please provide documentation to reflect 80 percent reduction of NO_x emissions due to oil firing by using the Selective Catalytic Reduction System proposed for the diesel engines. The brochure included with the application makes such claim only for gas firing.
8. Please indicate the form of ammonia that will be used for NO_x control.
9. Please provide information on the testing protocol used by the manufacturer in determining emissions from the diesel engine for the different criteria pollutants as presented in Tables 2-1 through 2-6.
10. Please provide information from the engine manufacturer that there is an upper limit of 6-percent diesel fuel requirement for ignition purposes when firing the engines with natural gas.

Please respond to the following three questions. The Department understands that these questions are not completeness issues relating to this application, but would like to receive a response in order to understand the project more thoroughly.

1. Lakeland City Commission minutes of February 19, 2001 indicate that several available sites were considered for this peaking station. Please provide to the Department details of the other sites that were considered and the reasons for not selecting those sites.
2. Please indicate if any provisions are made for noise reduction in the operations of the diesel engines. If so, what decibel level can be expected from the diesel engines and at what distance? Are there any local ordinances related to noise pollution that these diesel engines would have to comply with?
3. Please provide some information in terms of population and distances of the residential community near the peaking station.

The Department will resume processing your application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. Material changes to the application should also be accompanied by a new certification statement by the authorized representative or responsible official. Permit applicants are advised that Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days. We are still waiting for comments from the Southwest District. Those comments will be forwarded to you as soon as we receive them. If there are any questions, please call Syed Arif at 850/921-9528.

Sincerely,

A.A. Linero, P.E. Administrator
New Source Review Section

AAL/sa

cc: B. Thomas, SWD
G. Worley, EPA
K. Kosky, Golder Associates
J. Spence, Polk County

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Farzie Shelton
Manager of Environmental Affairs
Lakeland Electric
501 E. Lemon St
Lakeland, FL 33801-5079

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* B. Date of Delivery
B. Pultz 5/29/01

C. Signature
X B. Pultz ☐ Agent ☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
7000 0600 0026 4129 9334

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

7000 0600 0026 4129 9334

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here

Recipient's Name *(Please Print Clearly) (to be completed by mailer)*
Ms. Farzie Shelton
Street, Apt. No.; or PO Box No.
501 E. Lemon St.
City, State, ZIP+4
Lakeland, FL 33801-5079

PS Form 3800, February 2000 See Reverse for Instructions

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

May 15, 2001

0137552

Florida Department of Environmental Protection
Bureau of Air Regulation, New Source Review Section
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Attention: Mr. Syed Arif, P.E.

RE: CITY OF LAKELAND; WINSTON PEAKING PROJECT

Dear Syed:

Thanks for taking the time yesterday to meet with us. As we discussed today, I noticed that Page 2-6 was missing from my version of the application and you indicated that this page was also missing in your version as well. Please find attached 6 copies of the page that was inadvertently left out of the application.

Also, while we included a calculation of the total heat input limits proposed to limit emissions, I want to make sure it is clear how these values were determined. The heat input limits requested were in Section 2.4 and included 1,084,000 million British thermal units per year (MMBtu/yr) for oil firing and 2,487,000 MMBtu/yr for gas firing. As presented in the application, gas firing includes 6-percent heat input for diesel fuel using the diesel cycle for ignition. The proposed heat input limits are based on the information presented in page 17 of the application for each fuel type. This amount of fuel is based on assumed hours of operation to limit emissions, which will be less than the PSD significant emission rates when multiplied by the hourly emission rate. These calculations are shown in Tables 2-2 and 2-6 for oil and gas firing, respectively. Since the amount of emissions relative to the fuel usage for peak operation are the same as baseload firing, the total heat input requested is not affected by peak operation.

As an example of the calculation of the total heat input limit requested, the amount of distillate oil usage is equivalent to 2,150 hours per year at baseload operation or 20 units x 25.22 MMBtu/hr x 2,150 hours per year = 1,084,000 MMBtu/yr (some round-off in request). The NO_x emissions for this fuel use would be 2,150 hours x 11.6 pounds per hour x 20 units x ton/2,000 pounds = 249 tons per year. A similar procedure was used to determine the heat input limit for gas firing, with the only exception being the amount of distillate fuel used.

We have requested the other information discussed and should provide it by next week. Please call if there are any questions.

Sincerely,

Kennard F. Kosky, P.E.
Principal

KFK/nav

cc: Farzie Shelton, City of Lakeland
B. Thomas, SWD
4.1\051501L.doc C. Holladay
G. Worley, EPA

Table 2-2. Maximum Emissions for Criteria and Other Regulated Pollutants for the Winston Peaking Station Project
20 GM EMD 20/645/E4B Diesel Engines, Distillate Oil, 100 % Load

Parameter	One Engine	Twenty Engines
Hours of Operation	**2,150**	**2,150**
PM_{10} from Engines= Emission rate (lb/hr) from Engines manufacturer (a)		
Emission rate (lb/hr)- provided	**0.79**	**15.8**
(TPY) - based on provided value	**0.85**	**17.0**
Sulfur Dioxide (lb/hr)= Fuel Oil (lb/hr) x sulfur content(gr/100 cf) x (lb SO_2 /lb S) /100 (b)		
Fuel use (lb/hr)	**1,300**	**25,997**
Fuel Sulfur content	**0.05%**	**0.05%**
lb SO_2 /lb S (64/32)	**2**	**2**
Emission rate (lb/hr)- calculated	**1.30**	**26.0**
(TPY) - based on caculated value	**1.40**	**27.9**
Nitrogen Oxides (lb/hr)= Emission rate with 80% control (lb/hr) from Engines manufacturer (a)		
Emission rate (lb/hr)- provided	**11.6**	**231.7**
(TPY) - based on provided value	**12.4**	**249.1**
Carbon Monoxide (lb/hr)= Emission rate with 85% control (lb/hr) from Engines manufacturer (a)		
Emission rate (lb/hr)- provided	**0.80**	**15.8**
(TPY) - based on provided value	**0.85**	**17.0**
VOCs (lb/hr)= (40% control) * [0.09 lb/MMBtu x 91%] AP-42 x Fuel usage (MMBtu/hr) (b)		
Emission rate (lb/hr)- calculated	**0.78**	**15.6**
(TPY) based on calculated value	**0.84**	**16.8**
Sulfuric Acid Mist = SO2 emission rate (lb/hr) x conversion rate of SO2 to H_2SO_4 (%) x MW H_2SO_4 /MW SO_2 (98/64) (b)		
SO_2 emission rate (lb/hr)	**1.30**	**26.0**
lb H_2SO_4 /lb SO_2 (98/64)	**1.53**	**1.53**
Conversion to H_2SO_4 (%)	**5**	**5**
Emission Rate (lb/hr)- calculated	**0.100**	**1.99**
(TPY) based on calculated value	**0.107**	**2.14**

Source: (a) Genertek, 2001; (b) Golder Associates, 2001
Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Table 2-2. Maximum Emissions for Criteria and Other Regulated Pollutants for the Winston Peaking Station Project
20 GM EMD 20/645/E4B Diesel Engines, Distillate Oil, 100 % Load

Parameter	One Engine	Twenty Engines
Hours of Operation	**2,150**	**2,150**
PM_{10} from Engines= Emission rate (lb/hr) from Engines manufacturer (a)		
Emission rate (lb/hr)- provided	**0.79**	**15.8**
(TPY) - based on provided value	**0.85**	**17.0**
Sulfur Dioxide (lb/hr)= Fuel Oil (lb/hr) x sulfur content(gr/100 cf) x (lb SO_2/lb S) /100 (b)		
Fuel use (lb/hr)	**1,300**	**25,997**
Fuel Sulfur content	**0.05%**	**0.05%**
lb SO_2/lb S (64/32)	**2**	**2**
Emission rate (lb/hr)- calculated	**1.30**	**26.0**
(TPY) - based on caculated value	**1.40**	**27.9**
Nitrogen Oxides (lb/hr)= Emission rate with 80% control (lb/hr) from Engines manufacturer (a)		
Emission rate (lb/hr)- provided	**11.6**	**231.7**
(TPY) - based on provided value	**12.4**	**249.1**
Carbon Monoxide (lb/hr)= Emission rate with 85% control (lb/hr) from Engines manufacturer (a)		
Emission rate (lb/hr)- provided	**0.80**	**15.8**
(TPY) - based on provided value	**0.85**	**17.0**
VOCs (lb/hr)= (40% control) * [0.09 lb/MMBtu x 91%] AP-42 x Fuel usage (MMBtu/hr) (b)		
Emission rate (lb/hr)- calculated	**0.78**	**15.6**
(TPY) based on calculated value	**0.84**	**16.8**
Sulfuric Acid Mist = SO2 emission rate (lb/hr) x conversion rate of SO2 to H_2SO_4 (%) x MW H_2SO_4/MW SO_2 (98/64) (b)		
SO_2 emission rate (lb/hr)	**1.30**	**26.0**
lb H_2SO_4/lb SO_2 (98/64)	**1.53**	**1.53**
Conversion to H_2SO_4 (%)	**5**	**5**
Emission Rate (lb/hr)- calculated	**0.100**	**1.99**
(TPY) based on calculated value	**0.107**	**2.14**

Source: (a) Genertek, 2001; (b) Golder Associates, 2001
Note: ppmvd= parts per million, volume dry; O_2= oxygen.

LAKELAND ELECTRIC

Farzie Shelton, chE; REM

Manager of Environmental Affairs

May 14, 2001

Via Hand Delivery

Clair Fancy, P.E.
Chief, Bureau of Air Regulation
Department of Environmental Protection
111 South Magnolia Avenue, Suite 4
Tallahassee, FL 32301

Re: Minor Source Air Construction Permit Winston Peaking Station - Lakeland Electric

Dear Mr. Fancy:

Lakeland Electric (Lakeland) is proposing to construct and operate 20 nominal 2.5-MW GM EMD 20/645/E4B diesel engines at Winston Peaking Station located in Polk County, Florida in order to meet its generation needs. The annual operation for these units is based on limiting the facility to less than 250 tons per year for any air pollutant regulated under the Clean Air Act. Natural gas and distillate fuel oil with maximum sulfur content of 0.05 percent will be used. Lakeland is proposing to utilize fuel oil for the first two years of operation followed by utilization of gas, oil, or a combination of these fuels providing the annual average emissions of any regulated air pollutant does not exceed the 250 tons.

Lakeland is planning to commence construction of these units on August 1, 2001 with the completion date anticipated in December 2001 to meet its generation needs. Accordingly, you will find enclosed four copies of the air permit application prepared by Mr. Ken Kosky of Golder Associates Inc. together with a check for the sum of $5000 covering the permit fees.

We appreciate your cooperation in expediting this permitting process and look forward to working with you on this matter. If you should have questions, please do not hesitate to contact me.

Sincerely,

Farzie Shelton

Enc.

cc: Ken Kosky
A. Linero
C. Holladay, SWD
B. Thomas, SWD
D. Worley, EPA

LAKELAND ELECTRIC

Farzie Shelton, chE; REM

Manager of Environmental Affairs

May 14, 2001

Via Hand Delivery

Clair Fancy, P.E.
Chief, Bureau of Air Regulation
Department of Environmental Protection
111 South Magnolia Avenue, Suite 4
Tallahassee, FL 32301

Re: Minor Source Air Construction Permit Winston Peaking Station - Lakeland Electric

Dear Mr. Fancy:

Lakeland Electric (Lakeland) is proposing to construct and operate 20 nominal 2.5-MW GM EMD 20/645/E4B diesel engines at Winston Peaking Station located in Polk County, Florida in order to meet its generation needs. The annual operation for these units is based on limiting the facility to less than 250 tons per year for any air pollutant regulated under the Clean Air Act. Natural gas and distillate fuel oil with maximum sulfur content of 0.05 percent will be used. Lakeland is proposing to utilize fuel oil for the first two years of operation followed by utilization of gas, oil, or a combination of these fuels providing the annual average emissions of any regulated air pollutant does not exceed the 250 tons.

Lakeland is planning to commence construction of these units on August 1, 2001 with the completion date anticipated in December 2001 to meet its generation needs. Accordingly, you will find enclosed four copies of the air permit application prepared by Mr. Ken Kosky of Golder Associates Inc. together with a check for the sum of $5000 covering the permit fees.

We appreciate your cooperation in expediting this permitting process and look forward to working with you on this matter. If you should have questions, please do not hesitate to contact me.

Sincerely,

Farzie Shelton

Enc.

cc: Ken Kosky
D. Buff
C. Holladay
E. Lowe, SWD
B. Mosley, EPA

501 East Lemon Street ● Lakeland, Fl 33801-5050 ● (863) 834-6603 ● Fax (863) 603-5670 ● Message System 834-6592

farzie.shelton@lakelandgov.net