TENNESSEE REGULATORY AUTHORITY

460 James Robertson Parkway
Nashville, Tennessee 37243-0505

September 5, 2002

Ms. Stacey Gerard, Associate Administrator
U.S. Department of Transportation
RSPA/Office of Pipeline Safety
400 Seventh Street, SW Room 7128
Washington, D.C. 20590

Re: Additional information with respect to Nashville Gas Company, a Division of Piedmont Natural Gas Company, Inc. Request for Waiver of 49 CFR 192.121 and 192.123(a) of Part 192 of U.S.C. Title 49. TRA Docket Number 01-01133.

Dear Ms. Gerard:

Pursuant to your letter dated August 15, 2002, please find attached a detailed explanation of the referenced matter. This information is for your reconsideration of the Tennessee Regulatory Authority (TRA) order to allow the use of PA11 with a 0.40 design factor at a higher operating pressure.

The attached document provides answers to your objections regarding Nashville Gas Company's (NGC) application and technical merits for the use of PA11 at a higher operating pressure. We have included NGC's comments to your questions with our response. The State of Illinois granted a waiver for Nicor to use PA11 piping systems at 160 psig, which is above the current pressure regulations. The program has been a success. This installation, because of the supply pressure, will be limited to a maximum allowable operating pressure of 175 psig for the life of the material. It is our opinion that as additional installations are being planned and executed by other state agencies, (Utah Department of Commerce has recently published a notice of their intent to approve a waiver), the main motivation should be to evaluate the PA11 piping system as they will be used by the companies in their normal distribution system. Each of the subsequent installations should "raise the bar" by removing restrictions in order to proactively ascertain any potential problems that may arise under actual field conditions.

As outlined in the original order, TRA Gas Pipeline Safety staff will monitor the installation and quality assurance procedures developed specifically for PA11 during the installation of the main, all service lines, hot taps and testing coupons removed at twelve (12) and twenty-four (24) month intervals. Several provisions have been incorporated as part of the original order to ensure the safety and reliability of the gas distribution system. Additional leakage surveys beyond the requirements of Section 192.723 of the Minimum Federal Safety Standards will be performed and line markers identifying the area of the proposed project will be installed.

I would appreciate your prompt response in order to allow NGC to install the material before the heating season. If your organization has any additional questions or comments pertaining to the enclosed information please let us know.

Sincerely,

Glynn Blanton, Chief
Gas Pipeline Safety Division

Enclosure

cc: TRA Docket File
Richard Collier
John Clark, NGC
Fred Joyner, OPS-Southern Region

Tennessee Regulatory Authority Response to Questions from US DOT/RSPA

1. *Please indicate the diameters of the PA11 plastic pipe to be used in the main and service lines.* **Answer:** The proposed installation will be installed in Nashville Gas Company (NGC) service territory located in Mount Juliet, Wilson County, Tennessee along Rutland Road and Hunting Hills Road. The proposed project consists of 2-inch IPS main and 1-inch IPS service tubing as mentioned in TRA order/NGC's application. An additional copy of the TRA order and NGC application and map is attached.

2. *Please indicate the SDR numbers of the PA11 plastic pipe to be used in the main and service lines.* **Answer:** The 2-inch IPS main and 1-inch IPS service tubing is SDR 11. Mechanical tap tee is SDR11.

3. *Please indicate the class location of the main and service lines.* **Answer:** The main and service lines will be installed in a class 3 location.

4. *Please indicate if the waiver is permanent or only for a trial period in conjunction with the Gas Technology Institute study. If the latter, please indicate the length of the trial period.* **Answer:** The waiver is only for a trial period. The TRA order is site specific and consists of the location mentioned in item one above. The order includes provisions for removal of test sections of pipe at 12 and 24 month intervals to review in-service conditions. After removing pipe sections at the end of 24 months and performing necessary tests with Gas Technology Institute (GTI) and insuring results indicate that the pipe is free from defects and meets ASTM D 2513-96a requirements, the installation will be allowed to remain in service at 175 psig until the 24 month test data has been reviewed by GTI but not to exceed 6 months. After test data has been reviewed but not later than 6 months after the 24 month period the pressure will be lowered to 100 psig. If test results indicate the material does not meet ASTM D2513-96a requirements the pressure will be lowered to 100 psig or project abandoned in place.

5. *Please indicate if hot taps are to be performed on the PA11 plastic pipe.* **Answer:** It is the intention of the TRA to allow hot taps on PA11 piping systems using only mechanical tap tees. TRA, NGC, and manufacturer representatives from each of the materials used in the hot tap will be present to review the taps for quality control. The initial installation within the Nicor Gas service territory (Illinois Waiver ICC Docket No.: 98-0494) allowed the use of PA11 at higher operating pressure (160 psig) but did not allow hot tapping for additional service lines. Comprehensive testing carried out by the Gas Technology Institute corroborates the PA11 material's ability to perform hot tapping at pressures up to 200 psig. As a result, the intention of this order is to allow the use of hot tapping to provide gas service to additional customers after the initial installation has taken place. Furthermore, we believe that the idea of

the proposed installation is to test and evaluate the performance characteristics of PA11 piping systems under field conditions in order to proactively identify any potential problems.

6. *Please indicate if TRA staff will be present periodically during the installation of the PA11 plastic pipe.* **Answer:** In accordance with our letter dated June 18, 2002, the "TRA Gas Pipeline Safety staff will monitor the installation and quality assurance procedures developed specifically for PA11". We will be present on the installation of the entire project and during the installation of all service lines, hot taps, and removal of test coupons at the twelve and twenty-four month period. All records regarding the use of the pipe as it applies to material, length, pressure test, pipe size, wall thickness, environmental conditions, and class location will be reviewed by our staff. On June 21, 2002 TRA gas safety engineers reviewed all qualifying procedures related to joining of the material and participated in qualifying NGC's joiners for PA11.

7. *Please indicate why TRA believes it is safe to use a design factor of 0.40 instead of 0.32 to determine the design pressure of PA11 plastic pipe.* **Answer:** While our agency would not currently endorse amendment of Section 192.121 to reflect a design factor of 0.40, we feel that this pilot project would provide valuable data to the regulatory and industry community for consideration of such an amendment in the future. The reasons for allowing the use of a 0.40 design factor are as follows:

   - Improved materials and quality control. Resins utilized in the production of plastic pipe today perform better under stress compared to materials of the 60's and 70's. Manufacturing processes have improved through the years so that plastic pipe is produced with much closer tolerances than "vintage" pipe of 30 years ago.

   - Accepted under other standards. The Canadian Standards Association (CSA) has recently adopted a design factor of 0.40. The International Standards Organization (ISO) assigns design stresses of 580 psig and 725 psig to medium density (MDPE) and high density (HDPE). These values are equivalent to design factors of 0.48 and 0.45 for MDPE and HDPE respectively. A design factor of 0.50 has been an accepted practice in the United States for design of thermoplastic pipe in water applications.

   - Design factor basis. The original Section 192.121 of the Minimum Federal Safety Standards included design factors based on class location. Design factors of 0.32 for class 1, 0.25 for class 2 & 3, and 0.20 for class 4 were the accepted standards. In 1978, amendment 192-31 combined these factors into a single standard for all class locations (0.32). At that time, several comments were made to the proposed rule

change in support of a common 0.40 design factor based on many years of satisfactory use prior to the adoption of Section 192.121.

- Continuing studies. PA11 gas piping material has been studied extensively under laboratory and field conditions to characterize its integrity under various failure modes. Gas Technology Institute in conjunction with Nicor has compiled data pertaining to short-term ductile and long-term slow crack growth failures in PA11 piping material. Nicor established two pilot projects with operating pressure of 150 psig or more and has proven PA11 material's ability to withstand higher operating pressures.