

The Role of Interruptible Natural Gas Customers in New England Heating Oil Markets:

A Preliminary Examination of Events in January-February 2000

November 2000

**Office of Economic, Electricity and Natural Gas Analysis
Office of Policy
U.S. Department of Energy
Washington, DC 20585**

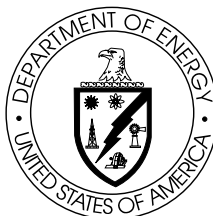


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Preface and Acknowledgments

This paper was prepared by the Office of Economic, Electricity and Natural Gas Analysis, Office of Policy, based on information collected and validated by the Energy Information Administration (EIA), Office of Oil and Gas. Questions regarding data in this report should be directed to the Office of Oil and Gas. Questions regarding the discussion of policy issues should be directed to the Office of

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Summary

During this past winter, especially in January and February 2000, there was a pronounced spike in the price of home heating oil in the Northeast. In response to the rising prices for heating oil, Secretary of Energy Bill Richardson convened public meetings to hear the views of various government, industry, and consumer representatives regarding the factors that may have contributed to supply shortages and price increases in the home heating oil (distillate fuel oil) market, and how future price spikes might be avoided. One possible causal factor identified by some speakers was the purchase of distillate fuel by interruptible natural gas customers whose gas deliveries had been suspended when temperatures turned colder. There was no information presented, however, to provide a basis for assessing the impact of such purchases relative to other factors that may have contributed to the price spike.

In the weeks that followed the public meetings, Senator Joseph Lieberman requested that the Department of Energy (DOE) prepare a study of the impact of interruptible natural gas contracts on the Northeast heating oil market. To evaluate concerns raised at the public meetings and to meet Sen. Lieberman's request, Secretary Richardson directed DOE's Office of Policy and the Energy Information Administration (EIA) to undertake such a study.

This report provides an analysis of data collected from gas service providers and end-use customers in the six New England States and offers a preliminary assessment of the impact of interruptible gas customers on the distillate fuel oil market this past winter.¹ Based on information collected and analyzed as of October 2000, the main findings are as follows:

➤ For interruptible gas customers with distillate fuel oil as a backup fuel, their volume of interruptions was equivalent to about 1 to 2 percent of the

total sales of distillate fuel oil in New England during January-February 2000. For the two peak weeks of gas supply interruptions, however, the equivalent volume of distillate fuel oil amounted to an estimated 3 to 6 percent of total sales in New England. There were no interruptions of firm natural gas service during the 2-month period.

➤ Purchases of distillate fuel oil by interruptible gas customers may have contributed somewhat to the spike in the price of distillate fuel oil in January-February 2000, especially during the peak weeks of gas interruptions. Nevertheless, other factors—a sudden drop in temperatures, low regional stocks of distillate fuels, and weather-related supply problems during a period of high customer demand—appear to have played a significant role in this price spike, as they have in previous spikes.

➤ While this preliminary analysis suggests that interruptible natural gas service does not threaten the stability of the home heating oil market, several steps might be taken—without undermining the benefits of interruptible service—to reduce the potential adverse impacts of gas supply interruptions in times of market stress.

Regardless of the magnitude of the impact of distillate fuel oil purchases by interruptible gas customers on Northeast heating oil markets, the threat of future heating oil price spikes and supply problems still remains. To help counter the threat, President Clinton in July 2000 directed Secretary Richardson to establish a heating oil component of the Strategic Petroleum Reserve in the Northeast, and 2 million barrels of heating oil are now stored in the reserve. Other possible policy options are outlined below.

Increase storage levels of backup fuels by interruptible gas customers. To the extent that consumption of distillate fuel oil by interruptible gas customers during periods of severe winter weather

¹An EIA report covering the entire Northeast region and providing a more comprehensive assessment of gas service interruptions, the responses of interruptible gas customers, and impacts on the distillate fuel oil market will be published in a few months.

could be derived from inventories rather than near-term purchases, the impact of their demand on distillate fuel oil prices would tend to be less. States could require that interruptible gas customers using distillate fuel oil maintain adequate backup inventories. Additional reporting of key data could assist States in the development of appropriate inventory policies.

Conduct an assessment of the feasibility of enhancing information programs associated with winter fuel markets in the Northeast. EIA could conduct an analysis of what additional data would need to be collected on a regular basis, as well as the costs associated with such data collection and reporting, so that affected parties could better assess: (1) the potential for disruptions of winter fuel markets in the Northeast and (2) the potential impacts of various mitigation actions. Such information would encompass aspects of the natural gas, petroleum product, and electricity markets, which are interdependent, and would include data on regional gas service interruptions, the volume of backup fuels used for substitution, and end-user stocks and storage capacity.

Encourage residential heating oil customers to take steps to reduce their exposure to price risk. Although residential heating oil customers in New

England have few cost-effective options for fuel switching, they can take other steps to limit their exposure to price spikes. Customer options include filling tanks during months when oil has historically been less expensive than the average annual price, and taking advantage of supplier budget plans or contracts that offer capped or fixed fuel prices.

Reduce reliance on distillate fuel oil as a primary or backup fuel. A number of options to reduce reliance on oil fuels are discussed in a recent DOE report, *The Northeast Heating Fuel Market: Assessment and Options*.² The report also notes, however, that economic considerations can often favor the continued use of heating oil.

Encourage greater residential energy efficiency. Energy conservation measures, such as installing set-back thermostats and lowering thermostat settings, can reduce home heating oil bills and thereby blunt the impact of any price spike. Government policies to encourage such actions could include information dissemination and subsidies.

Improve low-income energy assistance mechanisms. Financial compensation to economically vulnerable heating oil users could also offset hardships due to price spikes arising from any cause.

²Energy Information Administration and U.S. Department of Energy, Office of Policy, *The Northeast Heating Fuel Market: Assessment and Options*, DOE/PO-0061(00) (Washington, DC, July 2000).

1. Introduction

During the 1999-2000 winter heating season, prices of home heating oil in the Northeast began to rise rapidly in January 2000 and did not return to previous levels until late March 2000. Between January 17 and February 7, for example, the average price of home heating oil (distillate fuel oil) for residential customers in New England rose from \$1.18 per gallon to \$1.96 per gallon—a 66 percent increase over a 3-week period.³

To address public concerns about rising fuel bills, Secretary of Energy Bill Richardson convened meetings in Washington, DC, and Boston, Massachusetts, to hear the views of various government, industry and consumer representatives regarding supply shortages and price increases in the distillate fuel oil market in the Northeast. Some participants at the meetings suggested that the entry into the distillate market of interruptible natural gas customers because of the suspension of gas deliveries was a major cause of the spike in heating oil prices. There was no information presented at the meetings, however, to provide a basis for assessing the impact of such purchases relative to other factors that may have contributed to the price spike.

On February 4, 2000, Senator Joseph Lieberman requested that DOE investigate the effect of

interruptible natural gas contracts⁴ on the Northeast heating oil market. To meet Senator Lieberman's request and to evaluate concerns raised at the public meetings, Secretary Richardson directed EIA and the Office of Policy to undertake a study. The study has been divided into two phases. The first phase—the subject of this paper—focuses on the New England area and uses preliminary data. In a few months EIA plans to provide a more comprehensive analysis that will reflect the results of additional data collection and analysis and will cover a larger geographic region.

The remainder of this paper is organized as follows. Section 2 provides a brief overview of the New England markets for winter fuels, including distillate fuel oil and firm and interruptible natural gas. Section 3 provides an analysis of information derived from EIA surveys of gas service providers and customers. Section 4 addresses additional inquiries posed by Senator Lieberman in his letter to Secretary Richardson, including a discussion of findings and policy options (the letter is included as Appendix A). The EIA survey forms sent to gas service providers and consumers are provided as Appendixes B and C, respectively.

2. Overview of the Northeast and New England Fuel Markets

Households in New England and other parts of the Northeast rely on oil to meet their heating needs to a much greater extent than households in other areas of the country. Three-quarters of the 9.8 million U.S. households that used oil as their main heating fuel in 1997 were located in the Northeast Census

division, which includes New England and the Middle Atlantic States.⁵ Fifty-three percent of New England households and 31 percent of Middle Atlantic households used oil as a major heating fuel, compared to 3 percent of households throughout the rest of the Nation. Households in the Northeast

³Energy Information Administration and U.S. Department of Energy, Office of Policy, *The Northeast Heating Fuel Market: Assessment and Options*, DOE/PO-0061(00) (Washington, DC, July 2000). Prices in New England had fallen to \$1.40 per gallon by February 21 and \$1.32 per gallon by March 20.

⁴Both contracts and tariffs are discussed in this report. Tariffs contain the broad provisions under which gas companies provide service to their customers, whereas contracts contain the specific terms and level of service agreed to by the parties.

⁵The New England States are Maine, Vermont, New Hampshire, Massachusetts, Connecticut, and Rhode Island. The Middle Atlantic States are New York, New Jersey, and Pennsylvania.

accounted for 76 percent of total household oil consumption in the United States in 1997.⁶ A similar regional pattern is evident with respect to commercial buildings. As of 1995, 64 percent of commercial floor space in New England was in buildings that used oil, as compared with 39 percent in the Middle Atlantic States and 19 percent outside the Northeast region.⁷

Although the concerns of residential customers in the Northeast during this past winter were focused primarily on oil, natural gas also plays a significant role as a heating fuel in the region. Oil is the predominant home heating fuel in the six New England States, but more households throughout the Northeast region as a whole (including the Middle Atlantic States) rely on natural gas than on oil as their primary heating fuel.⁸ Recent and planned steps to increase the supply of natural gas to the Northeast hold the prospect of a larger role for natural gas in areas where it can be economically competitive, and natural gas is also a key component of environmental compliance strategies in the Northeast. Given the importance of natural gas in the region, the challenge for policymakers is to identify options that address oil market concerns without imposing undue burdens on natural gas markets.

Firm and Interruptible Natural Gas Customers

Firm service customers use natural gas mainly for space and water heating in residences and commercial facilities. Natural gas pipeline systems typically are sized to provide the maximum amount of gas that may be required by firm service customers. Pipeline companies must be prepared to provide daily service up to the maximum specified volume or service level under firm contracts or tariffs even

though the firm customers may not actually purchase or request transportation of that volume of gas on any given day. In return for this service guarantee, firm customers pay rates that allow pipeline companies to recover most of the fixed costs associated with the firm load, e.g., constructing, maintaining, and operating the pipeline system. Gas service providers rarely interrupt firm service, but interruptions can sometimes occur when natural gas is in short supply or when physical constraints prevent gas deliveries. The gas companies and customers contacted for this study reported that there were no interruptions in firm service during the period covered by the surveys (January and February 2000).

Commercial and industrial gas users sometimes prefer interruptible service because it is generally priced substantially lower than firm service. Interruptible gas service typically is offered to commercial and industrial customers served by pipelines for which the total gas supply requirements of firm customers are less than the physical capacity of the pipeline. Because interruptible customers are not taken into account in determining pipeline capacity, however, the availability of capacity to serve interruptible customers is often limited during periods of peak gas demand. On a short-term basis, pipeline throughput can exceed the design capacity of a pipeline, but providing a higher volume is generally costly to the pipeline operator, and it strains the operational capabilities of pipeline equipment.⁹

In the Northeast, under the terms of tariffs or contracts for interruptible sales or transportation, a gas service provider (usually a local distribution company) has the right to interrupt service under certain circumstances. Under temperature-controlled provisions, interruptions are triggered automatically when outside temperatures fall below a certain

⁶Energy Information Administration, *A Look at Residential Energy Consumption in 1997*, DOE/EIA-0632(97) (Washington, DC, November 1999), Table CE2-9c.

⁷Energy Information Administration, *A Look at Commercial Buildings in 1995: Characteristics, Energy Consumption, and Energy Expenditures*, DOE/EIA-0625(95) (Washington DC, October 1998), Table 5.

⁸Energy Information Administration, *A Look at Residential Energy Consumption in 1997*, DOE/EIA-0632(97) (Washington, DC, November 1999), Table CE2-9c.

⁹A pipeline's design capacity is defined as the maximum throughput that can be sustained throughout the year. Pipelines can be operated temporarily at pressures above the design level, but this puts an extra load on compressors and increases the possibility that leaks will develop in the pipelines. If excess delivery is sustained, pressures on other parts of the supply system can become unbalanced and possibly result in reverse flows that lower deliverability to other parts of the pipeline system.

level, such as 20 degrees Fahrenheit. In other cases, the service provider notifies the customer that gas supplies will be cut off so that sufficient system pressure will be available to ensure the continuation of service to firm customers. Service to interruptible customers is typically resumed when the outside temperature reaches a specified level and stays at the level or higher for a given period of time, or when there is again adequate pressure to serve both firm and interruptible customers.

Service interruptions may last for hours, days, or weeks during severely cold weather, but during periods of more moderate weather conditions, gas service may be provided without any suspension in service to interruptible customers. Some customers request interruptible service for only a short duration, such as a month, while others request interruptible service on a seasonal basis. Still others request gas supplies during at least some portion of the heating season, buying gas when it is available at a low price and switching to a backup fuel, such as distillate or residual oil, when gas becomes expensive or unavailable.

Interruptible service arrangements provide important economic benefits. Existing pipeline systems are not designed to serve both firm and interruptible customers throughout the year. To meet current levels of gas demand absent interruptible service arrangements, greater volumes of higher-cost peaking supplies, such as propane injection or liquefied natural gas from storage, would need to be provided, and/or additional pipeline capacity would need to be constructed and maintained. In either case, unit costs for gas service providers would increase, and the cost increases would be passed on to gas customers in the form of higher fuel prices. Without the option of interruptible service, current interruptible customers might also use less natural gas and turn to alternate fuels such as distillate fuel oil, and fuel oil prices would likely increase as a result.

The New England Market for Heating Fuels in January and February 2000

Prices in regional fuel markets, as in all competitive markets, are determined by the balancing of supply and demand. Any factor, or combination of factors, that leads to a shift in relative supply and demand can have a strong influence on commodity prices. The Northeast and New England fuel markets are reviewed at considerable length in a recent report prepared by EIA and the Office of Policy, *The Northeast Heating Fuel Market: Assessment and Options*¹⁰ (referred to here as “the DOE heating fuel report”).

As identified and discussed in the DOE heating fuel report, the key price-determining factors for the distillate fuel oil market include the world market for crude oil; local or regional markets for competing fuels (such as natural gas); distillate fuel oil refining and delivery capacity; the level of stocks (inventories) held by service providers; the extent of fuel delivery bottlenecks; and weather-induced fluctuations in demand. Weather is especially important in the market for distillate fuel oil in New England because distillate is widely used for heating homes and for meeting marginal fuel requirements in other sectors when demand is high and supplies of other fuels are limited.

Developments associated with many of the price-determining factors above had a significant effect on the distillate fuel market in New England during the latter part of 1999 and the early part of this year. There was a rapid increase in the world price of crude oil, a lower than normal inventory of distillate fuel oil, a rapid drop in temperatures in the third week of January, constraints on natural gas pipeline capacity in some areas, and a series of delivery and production problems for distillate fuel oil. These factors combined to produce sharp increases in the prices of distillate fuel oil and natural gas.

¹⁰Energy Information Administration and U.S. Department of Energy, Office of Policy, *The Northeast Heating Fuel Market: Assessment and Options*, DOE/PO-0061(00) (Washington, DC, July 2000).

At the beginning of the winter 1999-2000 heating season, world oil prices were rising dramatically. The price of crude oil, which had been about \$12 per barrel in February 1999, eventually rose to about \$34 per barrel in March 2000. In 1998 and 1999, major oil-producing countries had reduced production levels in response to the low crude oil prices. The decrease in production, in combination with increased worldwide demand, led to a substantial drawdown of world crude oil inventories. A related reduction in distillate fuel oil inventories took place in the United States. With crude oil prices rising faster than product prices in 1999, refiners reduced their purchases of crude oil and their production of refined products, including distillate fuel oil. By the end of 1999, stocks of distillate in New England and other areas of the United States had been drawn down much further than might have been expected on a historical basis.

The pressure exerted on the New England distillate fuel oil market by rising crude oil prices and low distillate inventories was exacerbated by relatively high natural gas prices and by gas supply constraints. In some equipment, such as boilers or generators, natural gas and distillate fuel oil can both be used. If the price of one rises relative to the other and the other fuel is available, some consumers—mostly large industrial facilities or power plants—switch to the lower priced fuel.

In October 1999, wellhead and spot market prices for natural gas were 35 percent and 60 percent higher, respectively, than in October 1998. The increase was due in part to higher prices for competing fuels and in part to expectations of higher natural gas consumption if normal weather patterns developed. When the weather turned colder in the Northeast in late December 1999, natural gas spot prices for delivery to the New York citygate rose substantially. In early December 1999, prices were generally below \$3.00 per million Btu, but by January 18 they had risen to \$6.34 per million Btu. Gas for delivery at the New York citygate traded above \$6.00 per million Btu on a majority of the days between January 13 and February 13.

Cold weather hit New England toward the end of January 2000. During the week of January 22, temperatures shifted from being 15 percent warmer than normal to 24 percent colder than normal. The drop in temperatures increased weekly heating requirements by about 40 percent, and the demand for distillate fuel oil increased accordingly. Residential and commercial consumers increased their use of distillate fuel oil for space heating; industrial concerns and power companies increased their use to meet the demand for electricity (in some cases by switching from natural gas); and industrial customers with dual-fuel facilities increased their use of distillate fuel oil by switching from natural gas, either as required by their gas service contracts or to avoid the higher price of natural gas. At the same time, problems arose for certain deliveries of distillate fuel oil. For example, ice problems on the Hudson River and high winds and rough water in Long Island Sound created difficulties for barge deliveries of heating oil to various markets.

All the market factors discussed above were ultimately reflected in distillate fuel oil prices. In mid-January 2000, prices rose dramatically in the Northeast. For example, between January 14 and February 4, New York Harbor spot prices for home heating oil (generally, high-sulfur No. 2 distillate fuel oil) rose from \$0.76 to \$1.77 per gallon, a 133 percent increase. Retail prices for distillate fuel oil—the prices faced by residential consumers—rose less dramatically but still showed strong increases. Between January 17 and February 7, the average price of oil for residential customers in New England rose from \$1.18 to \$1.96 per gallon, a 66 percent increase. For the typical household with a 275-gallon tank that was filled up at the peak price, the increase amounted to approximately \$140 for an average fill-up.¹¹ In February, the return to warmer weather and the arrival of new distillate supplies, mainly in the form of imports, relieved the market stress. By February 21 residential prices had fallen to \$1.40 per gallon, and they continued to decline during the remainder of the heating season.

¹¹This assumes an optimum fill of 182 gallons (see p. 57 of the DOE heating fuel report).

Comparison With Other Distillate Fuel Oil Price Spikes

The Northeast has experienced two other distillate price spikes in the past decade, one in the 1989-90 winter heating season and another in the 1993-94 winter heating season. Appendix C of the DOE heating fuel report discusses the dynamics of those price spikes in detail.

In the two earlier price spikes, as in the most recent winter heating season, demand increased when temperatures fell rapidly, delivery problems developed, and stocks were drawn down to low levels, with the result that distillate prices rose rapidly and remained volatile and elevated for several weeks.¹² In each

case, suspension of service to customers with interruptible natural gas contracts was only one of several major factors that contributed to increases in heating oil demand and low distillate stock levels. The three price spikes differed, however, with respect to the amount of stocks available at the start of the event and the severity of the weather. A good indicator of the potential for price spikes is the level of distillate stocks for the East Coast region (PADD 1) relative to its average winter pattern. In each case, when PADD 1 stocks fell to 10 million barrels below average, a price spike followed. In the most severe incidents—1989-90 and 1999-2000—stocks ultimately fell to 20 million barrels below average.¹³

3. Analysis of Survey Data on Interruptible Gas Service

To characterize the gas delivery interruptions during January-February 2000 and their impact on the distillate fuel oil market, EIA requested information from gas service providers and end-use customers. Survey Form EIA-903 (see Appendix B) was sent to 13 gas service providers serving the six New England States. The respondents provided information on volumes of gas associated with interruptible and firm service, as well as the volume of interruptions.¹⁴ Each service provider listed its gas customers that together accounted for the lesser of (1) the 50 largest interrupted customers (by interrupted volume) in each State or (2) at least 75 percent of the gas volumes they interrupted over the January-February 2000 period, and identified the backup fuel(s) capability for each customer (although some responses did not identify backup fuels).

All but a few New England gas service providers were surveyed as to their volume of interruptions. To estimate the volume of interruptions accounted for by the other service providers that were not respondents to the EIA-903 survey, and thereby arrive at an estimate of the total volume of interruptions over the relevant period, EIA used the shares of gas delivered under interruptible service by each company in each State in 1998, the most recent year for which EIA data were available, and applied that percentage to the volumes of deliveries and interruptions to impute the missing portion attributable to nonrespondents.

An estimated 146 trillion Btu of natural gas was delivered in New England in January-February 2000. Of that amount, 133 trillion Btu (91 percent)

¹²A quantitative analysis of the 1989-90 price spike that focused on electric utilities found that weather was the most significant factor leading to the price spike. Weather accounted for about 7 cents of a nearly 20 cent per gallon increase in distillate prices at that time. See Energy Information Administration, *Effects of Interruptible Gas Service: Winter 1989-1990*, SR/OG-91-01 (Washington, DC, June 1991).

¹³The week of February 16, 1996, when stocks were 10.7 million barrels below average, was the only other time since 1989 when distillate stocks crossed this threshold. Weekly average distillate spreads increased by more than 50 percent over the preceding 2 weeks, but demand moderated over the following 2 weeks. Stocks stopped falling, and distillate spreads fell back. See the DOE heating fuel report, Appendix C.

¹⁴In general, an “interruption” is said to have occurred when an interruptible gas customer experiences an unexpected and involuntary suspension in service. In responding to Form EIA-903, however, service providers provided estimates of interruptions based on actual deliveries, and therefore some suspensions or cutbacks in service initiated by the customer are included in the reported interruption estimates. While not usually considered interruptions *per se*, these voluntary suspensions did result in increased use of backup fuels. A copy of Form EIA-903 can be obtained at web site www.eia.doe.gov/oss/forms.html.

was provided under firm contracts, and 13 trillion Btu (9 percent) was provided under interruptible contracts.¹⁵ Despite the severe weather in New England in January-February 2000, no firm customers experienced service interruptions. Interruptions in service to interruptible gas customers resulted in the non-delivery of an estimated 3.8 trillion Btu of natural gas, or 24 percent of the total volume that could have been delivered under interruptible arrangements, according to estimates derived from data provided in response to the EIA-903 survey.¹⁶

On Form EIA-903, gas service providers also identified the backup fuels, on a customer-by-customer basis, that could have been used in January-February 2000 to replace the volume of gas that was interrupted.¹⁷ By applying the heat contents of the backup fuels identified, natural gas interruptions were expressed in volumetric units of the backup fuels.

Table 1 shows natural gas interruptions in New England for the January-February 2000 period in equivalent terms of the backup fuels identified by gas service providers on Form EIA-903. The equivalent volume of natural gas interruptions for customers with (No. 2) distillate fuel oil backup was about 247 thousand barrels, or 38 percent of the total volume of interruptions during the 2-month period. Residual fuel oil was the backup fuel identified for 35 percent of the interrupted volume. No. 4 distillate, unspecified fuels, and small amounts of propane, coal, and electricity were the backup

energy sources associated with the remainder of the interrupted gas volume.

Table 2 provides weekly estimates of the volumes of distillate fuel oil equivalent to the volume of interruptions for interruptible gas customers in New England identified on Form EIA-903 as having distillate fuel oil as a backup fuel. Two sets of estimates are provided to reflect uncertainties inherent in the estimates. To account for interruptions by gas service providers outside the respondent group, the pairs of estimates rely on reported volumes that then were inflated to impute the total volume.

The starting point for the base estimate was the volume of interruptions for customers that were specifically identified by their service providers as relying on distillate fuel oil as a backup fuel. The higher estimates were derived by adding to the lower estimates half of the interrupted volume for customers for whom no backup fuel was specified on Form EIA-903.¹⁸ This procedure provides a conservative upper bound estimate, in that 50 percent is a significantly larger fraction than indicated by the relative fuel shares shown in Table 1.

In the absence of data adequate to fully characterize the volume of purchases of backup fuels by interruptible gas customers to offset the interrupted volume in New England in January-February 2000, the volume of gas interruptions equivalent to volumes of backup fuels is provided in this report as an indicator of the magnitude of backup fuel purchases.

¹⁵The consumption estimate is based on EIA data on monthly deliveries to end users during January-February 2000 for each of the New England States except Massachusetts. Because EIA has incomplete information for deliveries in Massachusetts for this period, the total includes an estimate based on contracted quantities, or maximum daily quantities, as reported in the EIA-903 survey. The maximum daily quantity is generally the maximum level of service planned for in a tariff or contract, and is therefore a reasonable proxy for consumption under extreme weather conditions.

¹⁶Estimates of the amount of gas that could have been delivered are based on maximum daily quantities, contract amounts or planning levels as provided by local distribution companies about their service arrangements.

¹⁷To reduce the reporting burden, companies were not asked to provide backup fuel information for all customers but instead only those that together accounted for at least 75 percent of the interrupted volume, up to a total of fifty companies per State. The unreported data were estimated using the relative fuel shares provided of listed customers, under the assumption that the listed customers were representative of the entire customer universe.

¹⁸The imputation method adjusts the reported volumes by the inverse of the fractions of delivered volumes by company and State as recorded in the latest report year for EIA annual data, which is 1998. Two sets of State-level share factors were generated for either total deliveries or deliveries under interruptible contracts. The lower estimates were imputed by the larger of the two shares, so the adjustment would be less. In fact, the lower estimates were expanded only slightly, because the share factors for reporting companies accounted for at least 97 percent in each State in New England. The higher estimates were imputed by the smaller of the two share fractions, resulting in a larger adjustment. Share fractions in each State were 88 percent or higher, with the exception of Rhode Island, where the value was 38 percent.

Table 1. Natural Gas Interruptions in New England During January-February 2000, Expressed in Equivalent Volumes of Backup Fuels (Thousand Barrels)

| Backup Fuel | Volume |
|------------------|------------|
| No. 2 Distillate | 247 |
| No. 6 Residual | 230 |
| No. 4 Distillate | 36 |
| Other | 44 |
| Unspecified | 93 |
| Total | 651 |

Table 2. Natural Gas Interruptions in New England to Customers with Distillate Fuel Oil Backup, January-February 2000 (Thousand Barrels Oil Equivalent)

| Date | Base Estimate | High Estimate |
|----------------|---------------|---------------|
| Jan. 2-8 | 13 | 18 |
| Jan. 9-15 | 24 | 34 |
| Jan. 16-22 | 85 | 121 |
| Jan. 23-29 | 63 | 90 |
| Jan. 30-Feb. 5 | 37 | 52 |
| Feb. 6-12 | 23 | 33 |
| Feb. 13-19 | 1 | 2 |
| Feb. 20-26 | 1 | 1 |
| Feb. 27-29 | <0.5 | 1 |
| Total | 247 | 352 |

Nevertheless, it is important to note that, in certain ways, this measure would tend to overstate the actual volume of backup fuel purchases to offset the interrupted volumes. First, some customers who experienced interruptions suspended or scaled back operations rather than replacing the full volume of interrupted gas supplies with backup fuels. Second, some of the interrupted gas volumes were replaced with backup fuels from inventories rather than with new purchases of backup fuels. On the other hand, because backup fuels were not specified for some

interrupted customers who may actually have used distillate fuel oil as a backup, the figures provided here for equivalent volumes of each backup fuel would tend to understate the actual volumes of backup fuel purchased to offset the interrupted volumes.

Distillate Fuel Oil Demand by Interruptible Gas Customers in Perspective

For this preliminary report, DOE has made no attempt to provide a statistical estimate of the relative impact of each major factor that is likely to have contributed to the price spike. Nevertheless, it is possible to examine qualitatively the impact of interruptible gas customers versus other factors. Natural gas interruptions, as expressed in equivalent volumes of distillate fuel oil, and shown in Tables 1 and 2, for example, can be compared with the total volume of the distillate fuel oil market in New England over relevant time periods.

EIA's monthly data on prime service provider sales of distillate fuel oil indicate that the total sales volume of distillate fuel oil in New England in January-February 2000 was 17.4 million barrels.¹⁹ Coupled with the total volume figures shown in Table 2, this shows that for interruptible gas customers with distillate fuel oil as a backup fuel, their volume of interruptions represents about 1 to 2 percent of the total sales of distillate fuel oil in New England during January-February 2000. For the two peak weeks of gas supply interruptions, however, the equivalent volume of distillate fuel oil represents an estimated 3 to 6 percent of total sales in New England. Moreover, with inventories at low levels, the change in the price of distillate fuel oil could have been disproportionately larger than a change in demand of equal magnitude.

The demand of interruptible gas customers for distillate fuel oil as a backup fuel can also be compared with distillate fuel oil stocks immediately available in the region to meet demand. EIA data indicate that supplier stocks in New England at the end of

¹⁹Energy Information Administration, *Petroleum Marketing Monthly*, DOE/EIA-0380(2000/05) (Washington, DC, May 2000), Table 50. No comparable figures are available for consumption or purchases.

January 2000 were 3.5 million barrels. However, as noted in Section 2 above, suppliers' heating oil and other distillate stocks were extremely low in early 2000 relative to recent experience. For example, the January 2000 stock level was 11.5 million barrels lower than stocks in January 1999 and 6.5 million barrels lower than stocks in January 1998.²⁰ By comparison, the survey information reported in Table 2 indicates that in January 2000 the volume of distillate fuel oil equivalent to the volume of interruptions to interruptible gas customers in New England was about 0.3 million barrels.

The weather-induced demand for distillate fuel oil can also be compared with the demand of interruptible gas customers. As noted in Section 2 of this report, the sharp drop in January temperatures led to an increase in demand for distillate fuel oil by customers using it as their primary heating fuel, at the same time that the volume of interrupted gas supplies was peaking. Although purchases and burnertip consumption of oil are not coincident for individual customers, they are likely to correspond fairly closely on an aggregate basis (see discussion below).

The DOE heating fuel report notes that during the week ending January 22, temperatures in New England shifted to 24 percent colder than normal. Using EIA's 1997 Residential Energy Consumption System (RECS) data to calculate residential heating oil consumption per degree-day, that shift in weather increased residential heating oil demand in New England during the coldest week by nearly 70,000 barrels per day relative to normal January levels.²¹ The large impact of the temperature-induced change in demand is evident when this figure is compared with the average January sales figure for distillate fuel oil of nearly 299,000 barrels per day.²² Because conditions immediately preceding

the cold snap were warmer than normal, the absolute demand swing for residential customers was significantly larger. Moreover, the total impact of weather conditions on the distillate market would include not only the nearly 70,000 barrels per day estimated for the residential sector but also additional demand from the commercial and electricity generation sectors.

Backup Fuel Purchases and Inventories of Interruptible Gas Customers

The comparisons presented above place in context the estimated weekly and monthly volumes of distillate fuel oil equivalent to the volume of interrupted gas deliveries. However, information on the timing of purchases and the management of inventories of backup fuels is needed for a more complete picture of how interruptible gas customers may have contributed to the demand for distillate fuel oil in New England during January-February 2000.

The timing of distillate fuel oil purchases can be an important consideration. Unlike natural gas and electricity, fuels such as oil, kerosene, propane, and coal typically are purchased and delivered to customers in quantities that exceed daily consumption levels. The difference between deliveries and actual burnertip consumption is likely to be largest for an individual residential customer. The DOE heating fuel report calculates an expected delivery interval of 6 weeks under normal winter weather conditions for a typical New England consumer with a 275-gallon tank.²³ Anecdotal information suggests that commercial and industrial facilities generally receive deliveries more frequently than residential customers and typically have less on-site storage capacity relative to their daily burnertip consumption than do residential customers.

²⁰Energy Information Administration, *Petroleum Supply Monthly* (Washington, DC, March 1998, March 1999, and March 2000), Table 52.

²¹Energy Information Administration, *A Look at Residential Energy Consumption in 1997*, DOE/EIA-0632(97) (Washington, DC, November 1999), Table CE2-9c.

²²Energy Information Administration, *Petroleum Marketing Monthly*, DOE/EIA-0380(2000/05) (Washington, DC, May 2000), Tables 49 and 50.

²³Home heating oil customers typically have a 275- or 550-gallon tank. A typical residential furnace consumes less than 1 gallon of heating oil per running hour and often runs for only a fraction of a day.

When all buyers who use oil as their primary winter fuel are considered as an aggregate, there is likely to be a much closer relationship between purchases and burnertip consumption, because the “lumpiness” of individual deliveries averages out across the entire customer base. Such averaging out, however, may not be as likely in the case of customers who use oil as a backup fuel. There is a possibility that a number of customers could be purchasing oil at one time, and that such purchases occur when gas service has been interrupted.

For information on purchases, consumption, and inventories, EIA used Form EIA-904 (see Appendix C) to survey directly a sample of interruptible gas customers in New England who, according to information provided on Form EIA-903, experienced interruptions in natural gas service during January-February 2000. Because the focus of this paper is the impact of natural gas interruptions on the distillate fuel oil market, all the interrupted customers identified on Form EIA-903 as having distillate fuel oil as a backup fuel were included in the sample. Some customers identified on Form EIA-903 as not having distillate fuel oil as a backup fuel were also included in the sample to verify the accuracy of the EIA-903 information.²⁴ (These customers were selected from a random sample of the remaining New England customers identified by service providers as experiencing interruptions.) A total of 97 customers provided responses to the EIA-904 survey, of which 68 were reported by their gas service providers as using distillate fuel oil as a backup fuel and 29 were reported as using other backup fuels.

The analysis in this section is based on responses from 30 of the 97 customers providing responses on Form EIA-904. The 30 customers chosen were those who experienced interruptions of natural gas service during January-February 2000, purchased or consumed distillate fuel oil as a backup fuel, and provided data that were internally consistent.²⁵ For

the majority of the 30 customers, the volume of distillate fuel oil consumed was roughly comparable, in terms of heat content, to the volume of interrupted gas deliveries. Overall, however, less than half of the total volume of gas interrupted during the 2-month period was replaced by the consumption of distillate fuel oil. The lower than expected consumption volume results from the actions of the two largest customers, representing more than 70 percent of the interrupted volume, who chose to reduce operations rather than use backup fuels to replace all interrupted gas volumes. As discussed earlier in this section, this finding indicates that, all other things being equal, using the total volume of gas interruptions for customers with distillate fuel oil backup as a proxy for their consumption or purchases of distillate fuel oil would tend to overstate their actual consumption or purchases.

The impact of interruptible gas customers on the distillate fuel oil market would have been mitigated if, in response to the suspension of natural gas service, interruptible customers had consumed distillate fuel oil from inventories rather than purchasing the fuel either to provide supplies or to maintain inventory levels. Based on information from the EIA-904 survey, about 10 percent of the distillate fuel oil consumed over the 2-month period came from on-site inventories, which was equivalent to about 15 percent of total on-site inventories as of January 1, 2000. More importantly, during the week ending January 22, 2000, when the largest gas interruptions occurred, end users replaced over 90 percent of their distillate consumption with purchases instead of drawing down inventories.

Although the drawdown of distillate inventories could not have replaced all the interrupted natural gas during January and February 2000, increasing the drawdown and timing replacement fuel purchases differently could have reduced the pressure on the distillate market. Such purchasing decisions can be made with accuracy given perfect hindsight;

²⁴EIA found several cases in which the gas service provider reported the wrong backup fuel for an end user, but the low frequency was judged not significant enough to invalidate the responses overall. In addition, EIA found a number of cases in which the gas service provider reported that it interrupted a customer’s gas supply, whereas the customer reported switching to a less expensive alternate fuel.

²⁵A copy of Form EIA-904 can be obtained at web site www.eia.doe.gov/oss/forms.html.

however, it should be noted that backup fuel purchasing decisions are normally made under conditions of considerable uncertainty.

As part of its follow-on analysis of service interruptions in the Northeast, scheduled for publication in a few months, EIA is resolving data problems associated with the EIA-904 responses for the New England States. Consequently, the EIA analysis will be based on a larger sample for the region. The data problems include inconsistencies between the information provided on Form EIA-903 and Form EIA-904 with respect to backup fuels and volumes of interruptions.

EIA's follow-on analysis is also intended to provide a more complete picture of regional interruptions in

gas service, the responses of interruptible gas customers, and impacts on the distillate fuel oil market. The geographic scope of the study will be extended beyond New England to include New York, New Jersey, and Pennsylvania. An expanded geographical scope is important because of the relatively large volumes of interruptible gas service and the sizeable distillate market in the Northeast region, and because Senator Lieberman's request for a DOE study applied to the entire Northeast region. The EIA analysis will also provide more detail on interruptions by type of customer (i.e., power plant vs. small commercial facility) and will compare the January-February 2000 price spike with other recent price spikes.

4. Findings and Possible Policy Options

The discussions at the DOE-sponsored public meetings this winter, as well as the inquiry from Senator Lieberman, suggest considerable interest in determining the impact of interruptible gas customers on the Northeast heating oil market and in identifying actions that might be taken to ameliorate any adverse impacts. This section provides preliminary views on these "bottom line" issues.

Findings

Based on information collected and analyzed as of October 2000, our main findings are as follows:

- For interruptible gas customers with distillate fuel oil as a backup fuel, their volume of interruptions was equivalent to about 1 to 2 percent of the total sales of distillate fuel oil in New England during January-February 2000. For the two peak weeks of gas supply interruptions, however, the equivalent volume of distillate fuel oil amounted to an estimated 3 to 6 percent of total sales in New England. There were no interruptions of firm natural gas service during the 2-month period.
- Purchases of distillate fuel oil by interruptible gas customers, therefore, may have contributed somewhat to the spike in the price of distillate

fuel oil in January-February 2000, especially during the peak weeks of gas interruptions. Nevertheless, other factors—a sudden drop in temperatures, low regional stocks of distillate fuels, and weather-related supply problems during a period of high customer demand—appear to have played a significant role in this price spike, as they have in previous spikes.

- While this preliminary analysis suggests that interruptible natural gas service does not threaten the stability of the home heating oil market, several steps might be taken—without undermining the benefits of interruptible service—to reduce the potential adverse impacts of gas supply interruptions in times of market stress.

Possible Policy Options

Regardless of the magnitude of the impact of interruptible gas customers on Northeast heating oil markets, the threat of future heating oil price spikes and supply problems still remains. To help counter the threat, President Clinton in July 2000 directed Secretary Richardson to establish a heating oil component of the Strategic Petroleum Reserve in the Northeast, and 2 million barrels of heating oil are now stored in the reserve. (For further information

on the Northeast Heating Oil Reserve, see web site www.fe.doe.gov.) Other possible policy options are discussed below.

Interruptible gas customers can prepare for the possibility of gas service interruptions in several ways that involve economic choices. They can: (1) hold on-site physical inventories of backup fuels, (2) negotiate contracts with service providers of backup fuels for delivery of such fuels in the event of a gas service interruption, and (3) like other fuel users, hedge against price spikes by using financial instruments. Interruptible gas customers have several incentives to minimize their physical inventories of backup fuels. If the prices of the backup fuels decline, interruptible gas customers face the choice of either selling inventories at a loss or incurring the costs of using or storing relatively high priced fuels. Higher inventory levels could also result in increased capital and/or operating and maintenance costs. In addition, on-site storage may be perceived as posing safety and/or environmental risks that are to be avoided absent the immediate need for backup fuel supplies. Interruptible gas customers might decide, conversely, to purchase additional physical inventories of backup fuels if they expect prices to increase.

Policymakers and customers can also take several steps to reduce the potential for adverse impacts associated with the interruption of service to interruptible gas customers when the demand for heating fuels is high. Each of the approaches outlined below involves costs that would need to be borne by a market participant or a government entity.

Increase storage levels of backup fuels by interruptible gas customers. To the extent that consumption of distillate fuel oil by interruptible gas customers during periods of severe winter weather could be derived from inventories rather than near-term purchases, the impact of their demand on distillate fuel oil prices would tend to be lessened. States could require that interruptible gas customers using distillate fuel oil as a backup fuel have at least some minimum volume of inventory on-site (and/or under contract if a customer's on-site storage

capacity is limited). Additional reporting of key data could assist States in the development of appropriate inventory policies.

Inventory management requirements would ideally accompany any minimum volume requirements, so that interruptible gas customers would minimize their purchases to maintain a minimum inventory level during a period of severe winter weather. For example, States might establish minimum inventory levels that would be averaged over a rolling multi-week period. A more modest alternative to specific minimum inventory levels would be a requirement that interruptible gas customers using distillate fuel oil as a backup fuel annually certify, as a precondition for receiving interruptible service, that they have adequate inventories on site and/or under contract, or that they will cease operations fueled by gas when non-firm service is interrupted.

Approaches using incentives could provide payments or other subsidies to customers with interruptible gas service to shift their economic decision in favor of maintaining higher inventory levels. Incentives could also be used as a supplement to tariff provisions to encourage the construction of additional storage, or to encourage customers already capable of storing larger volumes of backup fuels to maintain inventories that would exceed any minimum requirements.

Conduct an assessment of the feasibility of enhancing information programs associated with winter fuel markets in the Northeast. EIA could conduct an analysis of what additional data would need to be collected on a regular basis, as well as the costs associated with such data collection and reporting, so that affected parties could better assess: (1) the potential for disruptions of winter fuel markets in the Northeast and (2) the potential impacts of various mitigation actions. Such information would encompass aspects of the natural gas, petroleum product, and electricity markets, which are interdependent, and would include data on regional gas service interruptions, the volume of backup fuels used for substitution, and end-user stocks and storage capacity.

Encourage residential heating oil customers to take steps to reduce their exposure to price risk.

Although residential heating oil customers in New England have few cost-effective options for fuel switching, they can take other steps to limit their exposure to price spikes. Customer options include filling tanks during months when oil has historically been less expensive than the average annual price, and taking advantage of supplier budget plans or contracts that offer capped or fixed fuel prices.

Budget plans and fixed price or price cap plans are price spike avoidance mechanisms that already are available but whose use could still be expanded substantially. As cited in the DOE heating fuel study, about 98 percent of Northeast heating oil dealers surveyed offer budget payment plans whereby customers pay their annual bills in eleven equal monthly amounts plus a twelfth payment that reconciles the total annual payment required. Similarly, 54 percent of dealers surveyed indicated that they provide price cap programs to residential customers for a small premium, and 55 percent offer guaranteed fixed pricing.

Such hedges can be effective insurance against all price spikes, not just those concurrent with gas delivery interruptions. Therefore, they merit consideration even if other steps are taken to reduce delivery spikes when gas sales to customers lacking firm contracts are interrupted. Mechanisms available to encourage the use of hedging mechanisms include:

- Providing information programs, such as public service announcements and brochures outlining the benefits of price protection plans.
- Implementing a check-off system under which consumers are enrolled into a budget program or receive a heating oil contract that includes price insurance unless they explicitly reject it.
- Providing financial incentives to retailers offering price protection plans. Subsidies or other incentives could be provided to oil retailers based on their success in enrolling customers in such plans.

Reduce reliance on distillate fuel oil as a primary or backup fuel.

Interruptible gas customers and other commercial or industrial customers that use distillate fuel oil as a primary or a backup fuel could be offered incentives to substitute, at least in part, residual oil or natural gas for distillate fuel oil. Several options available to residential customers to replace distillate fuel oil as a home heating fuel are discussed in the DOE heating fuel report. The report also notes, however, that economic considerations can often favor the continued use of heating oil. For example, even with recent price spikes, the report shows that heating oil customers in some areas of the Northeast where gas service is an available option have saved money by staying with oil as their primary heating fuel. While infrastructure expansion for fuels other than distillate fuel oil could lead some consumers to change their primary or backup fuel choices, a policy of steering residential users toward options other than heating oil may require special incentives.

Encourage greater residential energy efficiency. The DOE heating fuel report indicates that the potential for fuel switching and additional energy conservation is limited for homeowners in the Northeast. Nevertheless, the report does mention some relatively inexpensive conservation options—installing set-back thermostats and lowering thermostat settings—and more expensive options such as newer furnaces, multi-paned windows, and better insulation.

Improve low-income energy assistance mechanisms.

At the Federal level, the Low Income Home Energy Assistance Program (LIHEAP) is providing financial aid to low-income citizens. New or expanded State or local programs to provide financial compensation to economically vulnerable users of heating oil could also offset hardships due to price spikes arising from any cause.

Appendix A

Letter Requesting the Study

JOSEPH I. LIEBERMAN
CONNECTICUT
COMMITTEES:
ARMED SERVICES
ENVIRONMENT AND PUBLIC WORKS
GOVERNMENTAL AFFAIRS
SMALL BUSINESS

United States Senate
WASHINGTON, DC 20510-0703

SENATE OFFICE BUILDING
WASHINGTON, DC 20510
(202) 224-4041
STATE OFFICE:
ONE STATE STREET
14TH FLOOR
HARTFORD, CT 06103
860-549-8483
TOLL FREE: 1-800-225-5605
INTERNET ADDRESS:
senator_lieberman@lieberman.senate.gov
HOME PAGE:
<http://www.senate.gov/~lieberman/>

February 4, 2000

The Honorable William Richardson
Secretary
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Secretary Richardson:

I am writing to request an immediate investigation into the prevalence and use of interruptible natural gas contracts and their impact on heating oil supply in New England, and prompt steps to alleviate any adverse consequences. My office has recently learned of a potentially large problem resulting from these types of contracts, under which a customer benefits from lower rates by accepting a contract for natural gas delivery that may be interrupted at the discretion of the gas supplier when supplies are limited and demand is high.

I understand that the recent supply shortage of home heating oil and continuing price spike in the Northeast is now being exacerbated by demand from interruptible natural gas contract-holders. Apparently, a large number of these contract-holders were told by their gas suppliers at the beginning of last week that they temporarily would not have access to natural gas for heating their homes. As a result, many of these customers turned to home heating oil as a substitute, which, according to the heating oil delivery industry, may be increasing demand by as much as two million gallons per day.

This type of interruptible contract may have the unintended consequence of contributing to heating oil price spikes and supply shortages. It has and may continue to account for unanticipated demand for home heating oil; these additional demands have the capacity to cripple the market in times of stress. I would like to know more about the extent of, the need for, and the potential consequences of interruptible contracts. Please promptly survey the extent of interruptible gas contracts and the level of new demand they may be adding to the heating oil market in the Northeast. Specifically, I would like to know the answer to the following questions:

- At what point do natural gas contractors refuse service to interruptible gas contract-holders?

- How often in the recent past have users of interruptible gas contracts created a significant unforeseen demand on home heating oil in the Northeast?
- Do interruptible gas (or other fuel source) contracts threaten the stability of the home heating oil market?
- What other backup fuels do interruptible contract users utilize?
- If you confirm there is a significant problem, what steps will you take in cooperation with industry to promptly alleviate it?

Thank you for your continued interest in this issue.

Sincerely,



Joseph I. Lieberman
United States Senator

Appendix B

Form EIA-903

U.S. DEPARTMENT OF ENERGY
Energy Information Administration
Washington, D.C. 20585

FORM EIA-903
NATURAL GAS SERVICE INTERRUPTIONS IN THE NORTHEAST
DURING DECEMBER 1999, AND JANUARY AND FEBRUARY 2000

I. PURPOSE

The Form EIA-903 "Natural Gas Service Interruptions in the Northeast during December 1999, and January and February 2000" is designed to collect information concerning only those natural gas service arrangements respondent companies have with end users, i.e., those who burn or otherwise use the fuel. Any arrangements for deliveries to other natural gas service providers or distributors should be excluded. This information is being requested on a State basis for the following northeastern States: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. The Energy Information Administration (EIA) is conducting this mandatory survey under the general information gathering provisions provided under the Federal Energy Administration Act of 1974, P.L. 93-275.

II. WHO MUST REPORT

Selected local distribution companies (LDC's) and pipelines that delivered natural gas to consumers during December 1999, and January and February 2000 in the northeastern United States as listed in Part I above.

III. WHEN TO REPORT

Completed Forms EIA-903 "Natural Gas Service Interruptions in the Northeast during December 1999, and January and February 2000" are to be filed with the EIA postmarked on or before May 22, 2000.

IV. WHERE TO REPORT

Each respondent is required to submit the completed form in any of the following formats:

- an Excel spreadsheet,
- a WordPerfect file, or
- paper copy

To: Energy Information Administration: EI-44
Mail Station: BE-064 FORSTL
U.S. Department of Energy
Washington, D.C. 20585-0644
Attn: Form EIA-903

or

Fax completed form to (202) 586-4420
Attn: Form EIA-903

or

E-mail the completed form to either:
mary.carlson@eia.doe.gov or
barbara.marinervolpe@eia.doe.gov

For general information and/or assistance call either Mary Carlson at (202) 586-4749 or Barbara Mariner-Volpe at (202) 586-5878. Ms. Carlson and Ms. Mariner-Volpe can be contacted by e-mail at the addresses listed above.

V. PROVISIONS FOR CONFIDENTIALITY OF INFORMATION

Information supplied in response to this form will be kept confidential by the Energy Information Administration as follows. The Office of Legal Counsel of the Department of Justice concluded on March 20, 1991, that the Federal Energy Administration Act requires the EIA to provide company-specific data to the Department of Justice, or to any other Federal agency when requested for official use, which may include enforcement of Federal law.

The information contained on this form may also be made available, upon request, to another component of the Department of Energy (DOE), to any Committee of Congress, the General Accounting Office or other Congressional agencies authorized by law to receive such information. A court of competent jurisdiction may obtain this information in response to an order.

The information requested in this form will be kept confidential and not disclosed to the public to the extent that it satisfies the criteria for exemption in the Freedom of Information Act (FOIA), 5 U.S.C. §552, the DOE regulations 10 C.F.R. §1004.11, implementing the FOIA, and the Trade Secrets Act, 18 U.S.C. §1905.

Upon receipt of a request for this information under the FOIA, the DOE shall make a final determination whether the information is exempt from disclosure in accordance with the procedures and criteria provided in the regulations. To assist us in this determination, respondents should demonstrate to the DOE that, for example, their information contains trade secrets or commercial or financial information whose release would be likely to cause substantial harm to their company's competitive position. A letter accompanying the submission that explains (on an element-by-element basis) the reasons why the information would be likely to cause the respondent substantial competitive harm if released to the public would aid in this determination.

VI. SANCTIONS

The timely, comprehensive, and accurate submission of this form by those required to report is mandatory under §13(b) of the Federal Energy Administration Act of 1974 (FEA Act) P.L. 93-275.

VII. DEFINITIONS

Firm Service Tariffs or Contracts: Any tariff, contract, or other type of service arrangement under which the respondent agreed to provide firm continuous service without any provision for interruptions or a break in service during the contract period.

Interruptible Service Tariffs or Contract Categories: For purposes of this request, interruptible service includes any tariff, contract, or other type of service arrangement under which the responding company agreed to provide service but might discontinue the service upon some agreed upon conditions. This category would include service arrangements such as the following:

- service that is interrupted when the temperature drops to or below a specified level.
- contracts for firm service for much of the year but with a provision for being interrupted under certain conditions or during certain time periods. For example, if the service agreement is for 330 days of firm service and up to 35 days of a lower level of firm service or interruptible service, that type of service agreement should be categorized as interruptible for purposes of this survey.
- service is interrupted on a specific date or schedule.

Maximum Daily Quantity (MDQ): The maximum amount

of gas the transporter is obligated to deliver during any single day and for which the customer agrees to pay a fee. An MDQ may be specified in a tariff or contract service agreement. The MDQ is sometimes referred to as maximum daily contract quantity.

Northeastern United States: For the purposes of this survey, includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

GENERAL DESCRIPTION OF THE FORM

The Form EIA-903 "Natural Gas Service Interruptions in the Northeast during December 1999, and January and February 2000" is divided into six parts. All selected respondents are required to submit the form and must complete all data items applicable to the company's operations in the report State(s).

INSTRUCTIONS

General Instructions

If final numbers are not available for the information requested, estimated data are acceptable. Indicate with an "E" any estimated data element.

Computer files or other listings may be submitted in lieu of designated parts of the form.

The form may be copied as necessary to cover all rate schedules or contract categories. Computer files or other listings may be submitted in lieu of completing designated items. The form Part number should be written on any computer listing.

Part I. Identification and Certification

Requests the name, address, telephone number, and e-mail address of the person to be contacted with any questions regarding the submission.

The contact should be an individual who is familiar with the service arrangements of the responding company and its customers.

Part I also asks the responding company to indicate the units it will use for reporting, i.e., thousand cubic feet (Mcf) or dekatherms (Dth).

Part II. Interruptible Natural Gas Service Tariffs or Contract Categories

A. Description of Interruptible Natural Gas Service Tariffs or Contract Categories. Requests information on selected characteristics of interruptible service arrangements provided to end-use customers. This category should include any tariff or contract category that allows service to be interrupted at some time during the contract/tariff period. For example, if the annual service agreement is for 330 days of firm service and up to 35 days of a lower level of firm service or interruptible service, that type of service agreement should be categorized as interruptible for purposes of this survey.

Note: Copies of relevant parts of tariff schedules or contract categories are acceptable in lieu of the form.

B. Natural Gas Service Interruptions or Service Restrictions Under Interruptible Tariffs During the Period from December 1, 1999, to February 29, 2000.

Requests information by rate schedule or contract category listed in Part II (A) for any natural gas service that was interrupted during the period from December 1, 1999, to February 29, 2000.

Part III. Customers with Interruptible Natural Gas Service Interrupted during January and February 2000

Requests the names and contact information for customers with interruptible service agreements who were interrupted. Please list a sufficient number of companies to provide at least 75% of the total volume that was interrupted under all schedules up to a total of 50 companies in the report State. If possible, please list customers in order from largest to smallest volumes interrupted.

The customer contact listed should be an individual who is familiar with the service arrangements and the company practices regarding back-up fuel inventories and purchasing practices.

Part IV. Firm Natural Gas Service Tariffs or Contract Categories

Requests baseline monthly and weekly information for those categories of service which were interrupted during December 1999 and January and February 2000. (See definition of firm service.)

Part V. Customers with Firm Natural Gas Service Interrupted during January and February 2000

Requests the names and contact information for customers with firm service agreements who were interrupted. Please list a sufficient number of companies to provide at least 75% of the total volume that was interrupted under all schedules up to a total of 50 companies in the report State. If possible, please list customers in order from largest to smallest volumes interrupted.

The customer contact person should be an individual who is familiar with the service arrangements and the company practices regarding back-up fuel inventories and purchasing practices.

Part VI. Customers that Declined Service during January and February 2000

Requests the names and contact information for customers that declined natural gas service when interruptions were ended and natural gas service was offered/available in the report State. The customer contact should be an individual who is familiar with the service arrangements and company practices regarding back-up fuel inventories and purchasing practices.

U.S. DEPARTMENT OF ENERGY
Energy Information Administration
Washington, D.C. 20585

FORM EIA-903
NATURAL GAS SERVICE INTERRUPTIONS IN THE NORTHEAST
DURING DECEMBER 1999, AND JANUARY AND FEBRUARY 2000

| | | |
|--|--|----------------|
| This report is mandatory under the Federal Energy Administration Act of 1974 (Public Law 93-275). For the provisions concerning the confidentiality of information and sanctions, see Sections V and VI of the instructions. | | |
| PART I: Identification and Certification | | |
| 1. Company Name: | | |
| 2. Service in (State): | 3. Address (Street, City, State, Zip Code) | |
| 4. Contact Person: | 5. Title: | |
| 6. Telephone Number: | 7. E-mail address | 8. Fax Number: |
| 9. Signature: | 10. Date: | |

Important: Volumetric data filed on this Form are reported in (check one):

Mcf (thousand cubic feet)

Dth (dekatherms)

Heat Content: _____ Btu/cf

Company Name _____
 State _____

Part II: Interruptible Natural Gas Service Tariffs or Contract Categories

A. Description of Interruptible Natural Gas Service Tariffs or Contract Categories

Please provide the following information for each tariff schedule that allows service to be interrupted to an end-user. Any tariff or contract that allows service to be interrupted at some time during the contract/tariff period of service should be included. For example, if the annual service agreement is for 330 days of firm service and up to 35 days of a lower level of firm service or interruptible service, that type of service agreement should be categorized as interruptible for purposes of this survey.

Rate Schedule and Name of Interruptible Service

Note: For each rate schedule or contract category, your company must file information on Part II (B).

Describe the conditions under which the service is interrupted:

(A copy of the relevant portion of the tariff schedule or contract category may be attached in lieu of completing this Section. The rate schedule or contract category should be noted on the copy.)

Describe any requirements contained in the tariff or contract for fuel back-up arrangements by the customer:

(A copy of the relevant portion of the tariff schedule or contract category may be attached in lieu of completing this Section. The rate schedule or contract category should be noted on the copy.)

Please make additional copies of the form as necessary to cover each rate schedule or contract category.

Company Name _____
 State _____

Part II: Interruptible Natural Gas Service Tariffs or Contract Categories (continued)

B. Natural Gas Service Interruptions or Service Restrictions Under Interruptible Tariffs During the Period from December 1, 1999 to February 29, 2000

Please provide the following information by *tariff schedule or contract category listed in Part II (A) above* for any natural gas service that was interrupted during the period from December 1, 1999, to February 29, 2000. Provide the information for the report State in which your company made deliveries. Indicate with an "E" any information which is estimated.

| Rate Schedule and Name of Interrupted Service | Monthly Data | | | Weekly Data | | | | | | | | |
|---|--------------|----------|----------|-------------|------------|-------------|-------------|------------|------------|-------------|-------------|-------------|
| | Dec 1999 | Jan 2000 | Feb 2000 | 1/2 - 1/8 | 1/9 - 1/15 | 1/16 - 1/22 | 1/23 - 1/29 | 1/30 - 2/5 | 2/6 - 2/12 | 2/13 - 2/19 | 2/20 - 2/26 | 2/27 - 2/29 |
| Cumulative maximum daily quantity of gas to be provided under these contracts in each period. (e.g., if the maximum daily quantity (MDQ) for each day during February 2000 is 150 units, then the cumulative MDQ for February 2000 is 150 units/day x 29 days = 4,350 units.) | | | | | | | | | | | | |
| Total deliveries interrupted in each period. (e.g., if 100 units were interrupted for each of three days, the total interrupted deliveries would be 300 units) | | | | | | | | | | | | |
| Number of days interrupted under these contracts in each period. (If contract was interrupted for less than a day, provide the fractional day equivalent.) | | | | | | | | | | | | |
| Number of days of service with flow restrictions to customers in each period. (Service was not interrupted.) | | | | | | | | | | | | |

Please make additional copies of the form as necessary to cover each rate schedule or contract category.

Company Name _____
 State _____

Part IV: Firm Natural Gas Service Tariffs or Contract Categories

A. During the period from December 1, 1999 through February 29, 2000, did you curtail, suspend, or restrict service to any customer(s) with firm service tariffs or contracts in the State specified?

Check one: Yes No

B. If the answer to A was "No," please provide the monthly total of the maximum daily quantity of gas to all end-use customers with firm service for the following months (e.g., if the maximum daily quantity (MDQ) for each day during February 2000 is 150 units, then the cumulative MDQ for February 2000 is 150 units/day x 29 days = 4,350 units):

December 1999 _____
 January 2000 _____
 February 2000 _____

C. If the answer to A was "No," please turn to Part VI and complete as appropriate.

D. If the answer to A was "Yes," provide the following information for the total of all firm natural gas service tariffs or contract categories for the report State in which you had deliveries. Indicate with an "E" any information which is estimated.

| | Monthly Data | | | Weekly Data | | | | | | | | |
|---|--------------|----------|----------|-------------|------------|-------------|-------------|------------|------------|-------------|-------------|-------------|
| | Dec 1999 | Jan 2000 | Feb 2000 | 1/2 - 1/8 | 1/9 - 1/15 | 1/16 - 1/22 | 1/23 - 1/29 | 1/30 - 2/5 | 2/6 - 2/12 | 2/13 - 2/19 | 2/20 - 2/26 | 2/27 - 2/29 |
| Cumulative maximum daily quantity of gas to be provided under these contracts in each period. (e.g., if the maximum daily quantity (MDQ) for each day during February 2000 is 150 units, then the cumulative MDQ for February 2000 is 150 units/day x 29 days = 4,350 units.) | | | | | | | | | | | | |
| Total deliveries interrupted in each period. (e.g., if 100 units were interrupted for each of three days, the total interrupted deliveries would be 300 units) | | | | | | | | | | | | |
| Number of days interrupted under these contracts in each period. (If contract was interrupted for less than a day, provide the fractional day equivalent.) | | | | | | | | | | | | |
| Number of days of service with flow restrictions to customers in each period. (Service was not interrupted.) | | | | | | | | | | | | |

Please make additional copies of this form as necessary to complete the filing

Interruptible Natural Gas Customers in New England Heating Oil Markets

Appendix C

Form EIA-904

**CUSTOMER SURVEY OF NATURAL GAS SERVICE
INTERRUPTIONS IN THE NORTHEAST DURING
JANUARY AND FEBRUARY 2000**

LABEL
Company name
Control ID
State

1. The timely, comprehensive, and accurate submission of this form by those required to report is mandatory under §13(b) of the Federal Energy Administration Act of 1974 (FEA Act) P.L. 93-275.
2. Those required to report are selected users of natural gas located in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont whose supply of natural gas was interrupted during December 1999, or January or February 2000.
3. This completed form should be filed by June 16, 2000.
4. Data may be submitted directly on this form or in any other format, such as:

Excel spreadsheet
Word or WordPerfect file

Whatever format is used to report, ensure that answers are provided for all pertinent questions.

5. For general information and/or assistance call Ms. Dawn Thomas toll free at 1-800-937-8281 extension 2065.

6. Mail the completed form to:

Natural Gas Interruptions
c/o Westat
1650 Research Blvd.
Rockville, MD 20850
or

Fax the completed form to:

301-315-5934
Attn: Natural Gas Interruptions
or

E-mail the completed form to:

thomasd1@westat.com

PROVISIONS FOR CONFIDENTIALITY OF INFORMATION

Information supplied in response to this form will be kept confidential by the Energy Information Administration as follows. The Office of Legal Counsel of the Department of Justice concluded on March 20, 1991, that the Federal Energy Administration Act requires the EIA to provide company-specific data to the Department of Justice, or to any other Federal agency when requested for official use, which may include enforcement of Federal law.

The information contained on this form may also be made available, upon request, to another component of the Department of Energy (DOE), to any Committee of Congress, the General Accounting Office or other Congressional agencies authorized by law to receive such information. A court of competent jurisdiction may obtain this information in response to an order.

The information requested in this form will be kept confidential and not disclosed to the public to the extent that it satisfies the criteria for exemption in the Freedom of Information Act (FOIA), 5 U.S.C. §552, the DOE regulations 10 C.F.R. §1004.11, implementing the FOIA, and the Trade Secrets Act, 18 U.S.C. §1905.

Upon receipt of a request for this information under the FOIA, the DOE shall make a final determination whether the information is exempt from disclosure in accordance with the procedures and criteria provided in the regulations. To assist us in this determination, respondents should demonstrate to the DOE that, for example, their information contains trade secrets or commercial or financial information whose release would be likely to cause substantial harm to their company's competitive position. A letter accompanying the submission that explains (on an element-by-element basis) the reasons why the information would be likely to cause the respondent substantial competitive harm if released to the public would aid in this determination.

Public Reporting Burden for this collection of information is estimated to average 6 hours per response, including the time of reviewing instructions, searching existing data records, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Energy Information Administration, Statistics and Methods Group, EI-70, Washington, DC 20585-0670, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

All selected respondents are required to submit the form and must complete all data items applicable to the company's operations.

Part I: Identification

Please print. The contact person should be an individual who is familiar with the fuel service arrangements.

1. Name of company if different from front page: _____

2. Address of contact person (Street, city, state, zip code): _____

3. Name of contact person: _____

4. Title: _____

5. Telephone no.: _____ Fax number: _____

6. E-mail address: _____

7. Signature: _____ Date: _____

Part II: General Information

| | |
|---|---|
| 1. Did you experience an interruption in service of natural gas during January or February 2000? | <input type="checkbox"/> Yes <input type="checkbox"/> No (No further information is required. Please return the form as instructed on the front page.) |
| 2. When gas supplies were unavailable, did you use alternative fuels in place of natural gas for your operations? | <input type="checkbox"/> Yes <input type="checkbox"/> No (No further information is required. Please return the form as instructed on the front page.) |
| 3. Please indicate which of the following fuels were used to substitute for natural gas that was interrupted during January or February 2000. (Check each fuel used.) | <input type="checkbox"/> Distillate fuel oil <input type="checkbox"/> Propane (LPG) <input type="checkbox"/> Kerosene & Turbine Fuels <input type="checkbox"/> Residual Fuel Oils <input type="checkbox"/> Electricity <input type="checkbox"/> Natural gas (from alternate supplier) <input type="checkbox"/> Other, please specify: |
| 4. In general, during January and February, what is the maximum percentage of your natural gas needs that can be offset with distillate fuel oil? | _____ % |

Only data for selected heating season months for 1998 and 1999 and for selected weeks for 2000 are being requested. If final numbers are not available for the information requested, estimated data are acceptable. Indicate with an "E" any estimated data element.

Part III. Natural Gas Deliveries and other Energy Purchases in Period

IIA

Record monthly natural gas deliveries for the 3 months requested. Provide weekly data for the 9 weeks ending on the dates listed. Record any liquid fuel purchases for the same periods. *III b*

Report total volumes for the period. Indicate the units used for reporting, e.g., thousand cubic feet (Mcf) or dekatherms (Dth).

Interruptible Contract: For purposes of this request, interruptible service includes any contract, tariff, or other type of service arrangement where the energy supplier agreed to provide service but might discontinue the service upon some agreed upon conditions.

Firm Contract: Any contract, tariff, or other type of service arrangement under which the energy supplier agreed to provide firm continuous service without any provision for interruptions during the contract period.

Part IIIA. Natural Gas Deliveries in Period

| | Interruptible Contract | | | Firm Contract | Other |
|----------------------------------|------------------------|--------------------|------------------|------------------|------------------|
| | Days Interrupted | Volume Interrupted | Volume delivered | Volume delivered | Volume delivered |
| Units used for reporting: | | Units: | Units: | Units: | Units: |
| Monthly data | | | | | |
| Dec. 1998 | | | | | |
| Jan. 1999 | | | | | |
| Dec. 1999 | | | | | |
| Year 2000 week ending | | | | | |
| Jan. 8 | | | | | |
| Jan. 15 | | | | | |
| Jan. 22 | | | | | |
| Jan. 29 | | | | | |
| Feb. 5 | | | | | |
| Feb. 12 | | | | | |
| Feb. 19 | | | | | |
| Feb. 26 | | | | | |
| Mar. 4 | | | | | |

Part IIIB. Liquid Fuel Purchases in Period

| | Distillate | Propane (LPG) | Kerosene & Turbine Fuels | Residual Fuel Oils |
|----------------------------------|------------|---------------|--------------------------|--------------------|
| Units used for reporting: | Units: | Units: | Units: | Units: |
| Monthly data | | | | |
| Dec. 1998 | | | | |
| Jan. 1999 | | | | |
| Dec. 1999 | | | | |
| Year 2000 week ending | | | | |
| Jan. 8 | | | | |
| Jan. 15 | | | | |
| Jan. 22 | | | | |
| Jan. 29 | | | | |
| Feb. 5 | | | | |
| Feb. 12 | | | | |
| Feb. 19 | | | | |
| Feb. 26 | | | | |
| Mar. 4 | | | | |

Part IV. Means of Delivery for Purchases of Liquid Fuels

| How were deliveries made to the final point of consumption? | Truck | Barge | Pipeline | Other (specify) |
|---|--------------------------|--------------------------|--------------------------|--------------------------------|
| Distillate | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> _____ |
| Propane (LPG) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> _____ |
| Kerosene & Turbine Fuels | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> _____ |
| Residual Fuel Oils | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> _____ |

No. 2

Part V: Distillate Purchases to Offset Natural Gas

Report total volume for the period.

| | Units | Weekly Data for Year 2000 | | | | | | | | |
|------------|-------|---------------------------|------|------|------|-----|------|------|------|-----|
| | | 1/8 | 1/15 | 1/22 | 1/29 | 2/5 | 2/12 | 2/19 | 2/26 | 3/4 |
| Distillate | | | | | | | | | | |

Part VI: Liquid Fuels Consumed in Period

Report total volume for the period.

| | Distillate | Propane (LPG) | Kerosene & Turbine Fuels | Residual Fuel Oils |
|----------------------------------|------------|---------------|--------------------------|--------------------|
| Units used for reporting: | Units: | Units: | Units: | Units: |
| Monthly data | | | | |
| Nov. 1998 | | | | |
| Dec. 1998 | | | | |
| Jan. 1999 | | | | |
| Nov. 1999 | | | | |
| Dec. 1999 | | | | |
| Year 2000 week ending | | | | |
| Jan. 8 | | | | |
| Jan. 15 | | | | |
| Jan. 22 | | | | |
| Jan. 29 | | | | |
| Feb. 5 | | | | |
| Feb. 12 | | | | |
| Feb. 19 | | | | |
| Feb. 26 | | | | |
| Mar. 4 | | | | |

Part VII: On-Site Fuel Storage Capacity and Inventories

Part VIIA: On-Site Distillate Storage Capacity

Report as of end of period.

| | Units | Monthly Data | | | | | |
|------------|-------|--------------|-----------|-----------|-----------|-----------|-----------|
| | | Nov. 1998 | Dec. 1998 | Jan. 1999 | Dec. 1999 | Jan. 2000 | Feb. 2000 |
| Distillate | | | | | | | |

Part VIIB: On-Site Inventories of Liquid Fuels

Report end of period stocks.

| | Distillate | Propane (LPG) | Kerosene & Turbine Fuels | Residual Fuel Oils |
|----------------------------------|------------|---------------|--------------------------|--------------------|
| Units used for reporting: | Units: | Units: | Units: | Units: |
| Monthly data | | | | |
| Dec. 1998 | | | | |
| Jan. 1999 | | | | |
| Nov. 1999 | | | | |
| Dec. 1999 | | | | |
| Year 2000 week ending | | | | |
| Jan. 8 | | | | |
| Jan. 15 | | | | |
| Jan. 22 | | | | |
| Jan. 29 | | | | |
| Feb. 5 | | | | |
| Feb. 12 | | | | |
| Feb. 19 | | | | |
| Feb. 26 | | | | |
| Mar. 4 | | | | |

