

DANIEL S. ARTHUR
Principal

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Dr. Daniel Arthur is an economist consulting and providing litigation support primarily in the natural gas and oil industries. His economic areas of specialty include antitrust, pricing and ratemaking, and regulatory economics. Dr. Arthur holds both an M.A. and a Ph.D. in Economics from Northwestern University. He also has a B.S. in Business (Finance and Economics) and a B.S. in Mathematics and Statistics from Miami University. Prior to joining *The Brattle Group*, Dr. Arthur worked at Indiana University, where he worked on a team performing research in health economics. Dr. Arthur joined *The Brattle Group* in 1997.

AREAS OF EXPERTISE

- Antitrust
- Pricing and Ratemaking
- Regulatory Economics

EXPERIENCE

Antitrust

For numerous clients, Dr. Arthur has been involved in antitrust and market power cases before the Federal Energy Regulatory Commission, the Federal Trade Commission, and civil antitrust cases. Dr. Arthur's antitrust work includes the analysis of horizontal and vertical market power that would result from a proposed merger as well as the historical review of pricing behavior to determine whether market power was in fact exercised by an entity (or entities). Some of Dr. Arthur's consulting experience includes:

- On behalf of an oil refiner, Dr. Arthur presented testimony before the Federal Energy Regulatory Commission analyzing the market power held by a refined petroleum products pipeline seeking market based rates. Dr. Arthur's analysis focused on the competitiveness of alternatives to the pipeline from the refiner's perspective and the ability of the pipeline to increase prices in its destination markets. This analysis focused on the competitiveness of several geographic markets as well as how contracting between entities affects the substitutability of alternatives in the market.
- For a hearing before the Federal Energy Regulatory Commission and subsequent civil litigation, Dr. Arthur analyzed the market power resulting from control of natural gas pipeline capacity. The analysis involved defining the relevant markets, examining the anti-competitive behavior of

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holders of capacity to the destination market, and examining affiliate operations in the upstream market. One area of focus in this case was the impact of capacity constraints on the definition of the relevant market as well as the substitutability of alternatives to purchasing delivered natural gas. Analysis included examining the pricing behavior of market participants as well as examining the physical withholding of transportation capacity from the market.

- As the result of a settlement in a civil antitrust case, Dr. Arthur assessed the damages to entities consuming natural gas and electricity due to anti-competitive behavior in the natural gas transportation market. These damage estimates were performed at the class and individual entity level for numerous types of consumers and were used as the basis for the division of over \$1 billion in settlement funds.
- On behalf of a natural gas pipeline involved in an antitrust suit, Dr. Arthur analyzed whether the pipeline was (or is) a monopolist within a specific market. His analysis focused on defining the relevant product and geographic markets and assessing which firms competing within the relevant markets possessed market power. Analysis for this case focused on three factors in defining what the alternatives available in the relevant market are: (1) the impact of capacity constraints; (2) natural gas pipelines' ability to expand; and (3) the substitutability of purchasing the right to pipeline capacity on the secondary release market to contracting directly with the pipeline for primary capacity rights.
- Dr. Arthur assisted in the development of expert testimony regarding the evaluation of market power and allegations of a conspiracy to monopolize by a gas gathering, processing and natural gas liquids transportation company in Texas. Analysis in this case involved: (1) a detailed comparison of the cost of entry into the natural gas processing market to the prices charged for the service; (2) the contracting behavior of purchasers of natural gas gathering and processing services; and (3) the relationship between the regulated natural gas liquids pipeline's rate and its underlying cost structure.
- Dr. Arthur assisted in the evaluation of whether a crude oil pipeline possessed market power in the context of a market based rates application before the Federal Energy Regulatory Commission. The primary issue in this case was how the substitutability of different grades of crude oil from a refiner's perspective affects the ability to use alternative pipeline transportation.
- On behalf of an electric utility, Dr. Arthur was part of a team which assessed the state of intrastate transmission, storage, and distribution services of the natural gas utilities in California, focusing on the aspects of the market that were functioning well under current regulations, where there existed or the potential existed for market power abuse, and made recommendations for restructuring or changing regulatory policy.
- On behalf of an owner of a natural gas pipeline, Dr. Arthur analyzed the antitrust implications of the owner's acquisition of another natural gas pipeline in the geographic area. This analysis was

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performed prior to making the decision on whether to acquire the pipeline and assisted the client in determining how the Federal Trade Commission would view the proposed transaction.

- Dr. Arthur assisted in the development of expert testimony on vertical market power relating to a proposed merger of a gas distribution company and an electric utility, examining the relationship between the natural gas and electric markets. Analysis focused on determining what the relevant product and geographic markets are and the incentives that would result from the proposed merged entity, as well as an assessment of whether behavioral or structural remedies would be necessary to alleviate potential market power concerns.
- Dr. Arthur analyzed the anti-competitive incentives that would result from the combination of two general partners of partnerships involved in natural gas liquids processing, fractionation, transportation, and trading. This analysis included examining the incentives to manipulate the availability of infrastructure to influence the commodity price, as well as the extent of the information regarding competitors' and customers' market positions that would be obtained as a result of the proposed combination.

Pricing and Ratemaking

Dr. Arthur's experience includes participation in several ratemaking proceedings for crude oil pipelines, refined petroleum products pipelines, natural gas pipelines, and natural gas liquids pipelines. Some of Dr. Arthur's areas of analysis in these proceedings include:

- **Rate Base Determination:** Dr. Arthur's analysis in several proceedings includes the issue of what is a reasonable rate base level when there are historical contracts that provided for the recovery of capital associated with the initial investment in the facilities.
- **Income Tax Allowance:** A contested issue in numerous proceedings, Dr. Arthur has been involved in the determination of the level of income tax allowance that should be provided to the unit holders of the master limited partnership that owns the regulated pipeline.
- **Allocation of Unallocated Overhead Expenses to the Regulated Pipeline:** Dr. Arthur has analyzed what a reasonable allocation is of unallocated overhead expenses from the parent organization to the regulated pipeline subsidiary using methodologies employed at the Federal Energy Regulatory Commission.
- **Rate Design:** Dr. Arthur's work regarding costs associated with pipeline expansions includes analyzing the question of whether to allocate the expansion costs to a subset of the pipeline system's customers, or to roll-in the costs with the rest of the system's costs and allocate the costs across all customers based on volumes and distances.
- **Volume Level for Going-Forward Rates:** Dr. Arthur's analysis for determining just and reasonable rates to be established on a going-forward basis includes examining what a

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representative level of volumes to be used to derive rates is. Proceedings where this issue has been particularly relevant is when there has been a recent capacity expansion or pro-rationing has been occurring due to operational restrictions that are expected to be lifted in the future.

- Analysis of Changed Circumstances: Dr. Arthur assisted in the development of expert testimony in an oil pipeline ratemaking proceeding before the Federal Energy Regulatory Commission, addressing the establishment of substantially changed circumstances in the economic basis of the rates in order for a shipper to successfully challenge an existing pipeline rate.

Other Economic Analysis

- On behalf of electric utilities owning nuclear generation plants and for testimony filed in Federal court, Dr. Arthur developed an empirical model of a trading market for rights to remove spent nuclear fuel. The model determined when individual utilities could expect their spent nuclear fuel to be removed if a trading market for rights existed.
- For a proposed gas pipeline expansion, Dr. Arthur analyzed whether there existed sufficient market demand to justify the expansion, and the impact of the proposed expansion on existing pipelines and producers.
- For an arbitration, Dr. Arthur assisted in the determination of the underlying events that caused a refined products pipeline to enter into bankruptcy protection. Dr. Arthur's analysis included an examination of the pipeline's changing financial position through time, sources of financing, requests for regulated rate changes, and the required pipeline integrity management program.

PUBLICATIONS

Comments (along with Dr. Romkaew P. Broehm and Mr. Gary Taylor) before the Commodities Futures Trading Association regarding the notice of Proposed Rulemaking Prohibition of Market Manipulation, 17 CFR Part 180, RIN Number 3038-AD27, January 2011.

"Improving the Performance of Natural Gas Markets in Electricity System Reliability" (with Matthew O'Loughlin and Elizabeth Lacey), *Electric and Natural Gas Business: Using New Strategies, Understanding the Issues*, Robert E. Willet, Editor, 2004: 75-89.

"Oil Pipeline Complaint Procedures Are Being Clarified," (with Matthew P. O'Loughlin and Steven H. Levine), *Natural Gas*, Vol. 20, No. 2, (September 2003).

"Gas Use in Electricity Generation: Increases Uncertain in Northeast, Midwest" (with Matthew P. O'Loughlin and Steven H. Levine), *Natural Gas Industry Analysis for Gas Year 2000-2001*, Robert E. Willett, Editor, 2000.

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“Revision Rates Following Knee Replacement in the United States” (with D. Heck, C. Melfi, L. Mamlin, B. Katz, R. Dittus, and D. Freund), *Medical Care* 36(5) (May 1998): 661-669.

“Outcome Implications for the Timing of Bilateral Total Knee Arthroplasties” (with M. Ritter, L.A. Mamlin, C.A. Melfi, B.P. Katz, and D.A. Freund), *Clinical Orthopaedics and Related Research* No. 345 (1997): 99-105.

“Selecting a Patient Characteristics Index for the Prediction of Medical Outcomes Using Administrative Claims Data” (with C. Melfi, E. Holleman and B. Katz), *Journal of Clinical Epidemiology* 48(7) (1995): 917-26.

TESTIMONY

Before the Federal Energy Regulatory Commission on behalf of Lucknow-Highspire Terminals, LLC, Sheetz, Inc., Philadelphia Energy Solutions Marketing & Refining LLC, Giant Eagle, Inc., Guttman Energy, Inc., and Monroe Energy, LLC, Buckeye Pipe Line Company, L.P. and Laurel Pipe Line Company, L.P., Docket No. OR18-22-000, May 2018.

Before the Federal Energy Regulatory Commission on behalf of United Airlines, Inc., American Airlines, Inc., Delta Air Lines, Inc., Southwest Airlines Co., BP West Coast Products LLC, ExxonMobil Oil Corporation, Chevron Products Company, HollyFrontier Refining & Marketing LLC, Valero Marketing and Supply Company, Western Refining Company, L.P., Airlines for America, and the National Propane Gas Association, Inquiry Regarding the Effect of the Tax Cuts and Jobs Act on Commission-Jurisdictional Rates, Docket No. RM18-12-000, with Matthew P. O’Loughlin and Michael R. Tolleth, May 2018.

Before the Federal Energy Regulatory Commission on behalf of PBF Holding Company LLC, Lucknow-Highspire Terminals, LLC, C.H.R. Corp. d/b/a The Rutter’s Companies, and Sheetz, Inc., *Buckeye Pipe Line Company, L.P.*, Dockets Nos. IS18-228-000 *et al.*, April 2018.

Before the Federal Energy Regulatory Commission on behalf of BP Products North America, Inc. and Trafigura Trading LLC and TCPU Inc., *BP Products North America, Inc. et al. v. Colonial Pipeline Company*, Docket No. OR18-12-000, February 2018.

Before the Federal Energy Regulatory Commission on behalf of Bill Barrett Corporation, ConocoPhillips Company, Kerr McGee Oil & Gas Onshore, LP, and Noble Energy Inc., *White Cliffs Pipeline, L.L.C.*, Docket No. OR18-9-000, February, September 2018.

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Before the Federal Energy Regulatory Commission on behalf of Epsilon Trading, LLC, Chevron Products Company, and Valero Marketing and Supply Company, *Epsilon Trading, LLC et al. v. Colonial Pipeline Company*, Docket No. OR18-7-000, November 2017.

Before the Federal Energy Regulatory Commission on behalf of EnLink NGL Marketing, LP, *West Texas LPG Pipeline Limited Partnership*, Docket No. OR17-19-000, November 2017.

Before the Federal Energy Regulatory Commission on behalf of Phillips 66 Company, *Wood River Pipe Lines LLC*, Docket No. OR17-11-000, July 2017, June 2018.

Before the Federal Energy Regulatory Commission on behalf of United Airlines, Inc., American Airlines, Inc., Delta Air Lines, Inc., Southwest Airlines Co., BP West Coast Products LLC, ExxonMobil Oil Corporation, Chevron Products Company, HollyFrontier Refining & Marketing LLC, Valero Marketing and Supply Company, Western Refining Company, L.P., Airlines for America, and the National Propane Gas Association, *Inquiry Regarding the Commission's Policy for Recovery of Income Tax Costs*, Docket No. PL17-1-000, with Matthew P. O'Loughlin and Michael R. Tolleth, April 2017.

Before the Federal Energy Regulatory Commission on behalf of Airlines for America, the National Propane Gas Association, and Valero Marketing & Supply Company, *Revisions to Indexing Policies and Page 700 of FERC Form 6*, Docket No. RM17-1-000, January 2017, March 2017.

Before the Pennsylvania Public Utility Commission on behalf of Gulf Operating, LLC, *Application of Laurel Pipe Line Company, L.P.*, Docket No. A-2016-2575829, January 2017, July 2017, October 2017.

Before the California Public Utilities Commission, *Application of San Pablo Bay Pipeline Company LLC* on behalf of Tesoro Refining and Marketing Company and Valero Marketing & Supply Company, Application No. 16-10-020, December 2016, June 2017.

Before the Federal Energy Regulatory Commission on behalf of Aircraft Service International Group, Inc. American Airlines, Inc., Delta Air Lines, Inc. Hookers Point Fuel Facilities LLC, Southwest Airlines Co., United Aviation Fuels Corporation and United Parcel Services, Inc., *Aircraft Service International Group, Inc. et al. vs. Central Florida Pipeline LLC and Kinder Morgan Liquid Terminals LLC*, Docket No. OR16-26-000, September 2016, August 2017.

Before the Regulatory Commission of Alaska on behalf of North Slope Borough D/B/A Nuiqsut Natural Gas Pipeline, *North Slope Borough D/B/A Nuiqsut Natural Gas Pipeline*, Docket No. TA 4-579, September 2016.

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Before the Federal Energy Regulatory Commission on behalf of Delta Air Lines, Inc., Atlas Air, Inc., and Polar Air Cargo Worldwide, Inc., *Delta Air Lines, Inc. et al. v. Enterprise TE Products Pipeline Company LLC*, Docket No. OR16-23-000, August 2016.

Before the California Public Utilities Commission, *Application of Crimson California Pipeline L.P.* on behalf of Valero Marketing & Supply Company, Application No. 16-03-009, April 2016, November 2016.

Before the Federal Energy Regulatory Commission on behalf of Chevron Products Company, HollyFrontier Refining & Marketing LLC, US Airways, Inc., Valero Marketing and Supply Company and Western Refining Company L.P., *Chevron Products Company et al. v. SFPP, L.P.*, Docket No. OR 16-6-000, November 2015, June 2016, and November 2016.

Before the Federal Energy Regulatory Commission on behalf of Airlines for America, the National Propane Gas Association, and Valero Marketing & Supply Company, *Petition for a Rulemaking*, Docket No. RM15-19-000, September 2015.

Before the Federal Energy Regulatory Commission on behalf of Suncor Energy Marketing Inc. and Phillips 66 Company, *Seaway Crude Pipeline Company LLC*, Docket No. OR15-6-000, February 2015, February 2016, April 2016.

Before the Federal Energy Regulatory Commission on behalf of HollyFrontier Refining & Marketing LLC, *Osage Pipe Line Company, LLC*, Docket No. OR15-8-000, February 2015.

Before the Federal Energy Regulatory Commission on behalf of *American Airlines, Inc. v. Buckeye Pipe Line Company, L.P.*, Docket No. OR14-41-000, September 2014.

Before the Railroad Commission of Texas, *Westlake Ethylene Pipeline Corporation*, on behalf of Westlake Ethylene Pipeline Corporation, Docket No. 10358, June 2014, July 2014.

Before the Federal Energy Regulatory Commission, *North Dakota Pipeline Co. LLC*, on behalf of St. Paul Park Refining Corporation LLC, Docket No. OR14-21-000, March, 2014, April 2014.

Before the United States District Court Southern District of New York, on behalf of *Go Green Realty Corp. et al v. Liberty Petroleum Realty, LLC et al*, Docket No. 11CV5360 (DCF), December 2013

Before the Federal Energy Regulatory Commission, on behalf of *US Airways, Inc. v. Colonial Pipeline Company*, Docket OR14-17-000, December 2013.

Before the Federal Energy Regulatory Commission, on behalf of *Guttman Energy Inc. and PBF Holding Company LLC v. Buckeye Pipe Line Company and Laurel Pipe Line Company, L.P.*, Docket OR14-4-000, October 2013, November 2013, September 2014, February 2015.

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Before the Federal Energy Regulatory Commission, on behalf of *United Airlines, Inc. and Southwest Airlines Company v. Colonial Pipeline Company*, Docket OR14-18-000, December 2013.

Before the Federal Energy Regulatory Commission, *Buckeye Pipe Line Company*, on behalf of Delta Air Lines, Inc., Continental Airlines, Inc., JetBlue Airways Corporation, United Air Lines, Inc. and US Airways, Inc., Docket Nos. OR13-3-000, December 2012, January 2015.

Before the California Public Utilities Commission, *Application of SFPP, L.P.* on behalf of Chevron Products Company, Phillips 66 Company, Southwest Airlines Company, Ultramar Inc., and Valero Marketing & Supply Company, Application No. 12-01-015, November 2012, February 2013, April 2013.

Before the Federal Energy Regulatory Commission, *Delta Air Lines, Inc., et al. v. Buckeye Pipeline Company, L.P.* on behalf of Delta Airlines, Continental Airlines, Inc., JetBlue Airways Corporation, United Air Lines, Inc., and US Airways, Inc., Docket No. OR12-28-000, September 2012, September 2014, January 2015.

Before the Federal Energy Regulatory Commission, *Mobil Pipe Line Company*, on behalf of Suncor Energy Marketing, Inc., Canadian Natural Resources Limited, and Husky Marketing and Supply Company, Docket No. IS12-553-000, September 2012.

Before the Federal Energy Regulatory Commission, *Enterprise Products Partners L.P. and Enbridge Inc.* on behalf of Continental Resources, Inc., Husky Marketing and Supply Company, Suncor Energy Marketing, Inc., and Canadian Natural Resources Limited, Docket No. OR12-4-000, August 2012

Before the Federal Energy Regulatory Commission, *NuStar Logistics, L.P.*, on behalf of Valero Marketing and Supply Company, Docket Nos. IS12-502-000 and IS12-503-000 (not consolidated), July 2012.

Before the Federal Energy Regulatory Commission, *Buckeye Pipe Line Company*, on behalf of Delta Air Lines, Inc., Docket Nos. OR12-185-000, June 2012.

Before the Federal Energy Regulatory Commission, *Osage Pipeline Company, LL*, on behalf of HollyFrontier Refining and Marketing, LLC, Docket No. OR12-21-000, June 2012.

Before the Federal Energy Regulatory Commission, *Mobil Pipe Line Company*, on behalf of Suncor Energy Marketing, Inc. and Canadian Natural Resources Limited, Docket No. OR07-21-000, June 2012.

Before the Federal Energy Regulatory Commission, *Plantation Pipe Line Company*, on behalf of United Airlines Fuel Corporation, Docket No. IS12-382-000, June 2012.

Before the Federal Energy Regulatory Commission, *Plains Pipeline, L.P.*, on behalf of Valero Marketing and Supply Company, Docket No. IS12-362-000, June 2012.

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Before the Federal Energy Regulatory Commission, *Nustar Logistics, L.P.*, on behalf of Valero Marketing and Supply Company, Docket No. IS12-314-000, June 2012.

Before the Federal Energy Regulatory Commission, *Seaway Crude Pipeline Company LLC*, on behalf of Suncor Energy Marketing, Inc., Canadian Natural Resources Limited, and Denbury Onshore LLC, Docket No. IS12-226-000, April 2012, October 2012.

Before the Federal Energy Regulatory Commission, *Enterprise TE Products Pipeline Company LLC*, on behalf of National Propane Gas Association *et al.*, Chevron Products Company, CHS, Inc., HWRT Oil Company LLC, and Truman Arnold Companies, Docket No. IS12-203-000, April 2012, October 2012.

Before the Federal Energy Regulatory Commission, *Enterprise TE Products Pipeline Company LLC*, on behalf of National Propane Gas Association *et al.*, Chevron Products Company and HWRT Oil Company LLC, Docket Nos. IS12-160-000 and IS12-165-000 (not consolidated), February 2012.

In arbitration, *Natural Gas Pipeline Company of America LLC v. Kinder Morgan Kansas, Inc.*, on behalf of Natural Gas Pipeline Company of America LLC, June 2011.

Before the Federal Energy Regulatory Commission, *Enterprise TE Products Pipeline Company LLC*, on behalf of Chevron Products Company and Lion Oil Company, Docket No. OR 11-6-000, April 2011, February 2012.

Before the Federal Energy Regulatory Commission, *SFPP, L.P.*, on behalf of Chevron Products Company, ConocoPhillips Company, Southwest Airlines Co., and Valero Marketing and Supply Company, Docket No. IS09-437-000, March 2010.

Before the Federal Energy Regulatory Commission, *Magellan Pipeline Company, L.P.*, on behalf of Frontier Oil and Refining Company, Docket No. OR10-6-000, March 2010, January 2011.

Before the California Public Utilities Commission, *Application of SFPP, L.P.*, on behalf of Chevron Products Company and ConocoPhillips Company, Application Nos. 09-05-014 *et al.*, December 2009.

Before the Federal Energy Regulatory Commission, *SFPP, L.P.*, on behalf of Continental Airlines, Inc., Northwest Airlines, Inc., Southwest Airlines Co., US Airways, Inc., Chevron Products Company, ConocoPhillips Company, and Valero Marketing and Supply Company, Docket No. IS08-390-002, January 2009, June 2011, February 2012.

Before the Federal Energy Regulatory Commission, *SFPP, L.P.*, on behalf of America West Airlines, Inc., Continental Airlines, Inc., Northwest Airlines, Inc., Southwest Airlines Co., US Airways, Inc., Chevron Products Company, and ConocoPhillips Company, and Valero Marketing and Supply Co., Docket No. OR03-5-000, June 2008, October 2008.

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Before the Federal Energy Regulatory Commission, *SFPP, L.P.*, on behalf of Chevron Products Company and ConocoPhillips Company, Docket No. OR03-5-001, April 2008.

Before the Federal Energy Regulatory Commission, *Mobil Pipe Line Company*, on behalf of Suncor Energy Marketing Inc. and Canadian Natural Resources Limited, Docket No. OR07-21-000, October 2007, November 2007, April 2008, July 2008.

Before the Federal Energy Regulatory Commission, *SFPP, L.P.*, on behalf of Chevron Products Company, ConocoPhillips Company, and Valero Marketing and Supply Company, Docket Nos. OR96-2-012, *et al.*, April 2007.

Before the Federal Energy Regulatory Commission, *Mid-America Pipeline Company, LLC*, on behalf of National Propane Gas Association, AmeriGas Propane, L.P., CHS, Inc., ConocoPhillips Company, Ferrellgas, L.P., and Targa Liquids Marketing and Trade, Docket Nos. IS05-216-003, *et al.*, March 2007.

Before the Federal Energy Regulatory Commission, *SFPP, L.P.* on behalf of ConocoPhillips Company, Docket Nos. OR96-2-000 *et al.*, April 2006.

Declarations before the Superior Court of the State of California in support of Ex Parte Applications for Entry of Third and Fourth Distribution Orders in Natural Gas Antitrust Cases I, II, III, and IV [J.C.C.P. Nos. 4221, 4224, 4226 and 4228], April 2005, May 2005, December 2005.

Before the Federal Energy Regulatory Commission, *Sunoco Pipeline L.P.* on behalf of ConocoPhillips Company, Docket No. OR05-7-000, June 2005, August 2005.

Before the Federal Energy Regulatory Commission, *Shell Pipeline Company L.P.* on behalf of ConocoPhillips Company, Docket No. OR02-10-000, January 2004, March 2004.