

VERIFICATION

STATE OF OHIO)
) SS:
COUNTY OF HAMILTON)

The undersigned, Bruce Sailors, Director Jurisdictional Rate Administration, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

Bruce L. Sailors
Bruce Sailors Affiant

Subscribed and sworn to before me by Bruce Sailors on this 24TH day of JANUARY, 2023.



ADELE M. FRISCH
Notary Public, State of Ohio
My Commission Expires 01-05-2024

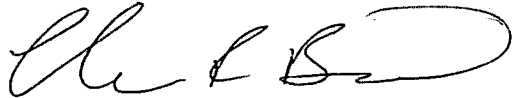
Adele M. Frisch
NOTARY PUBLIC

My Commission Expires: 1/5/2024

VERIFICATION

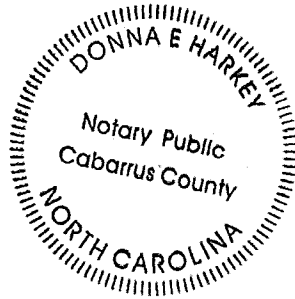
STATE OF NORTH CAROLINA)
)
COUNTY OF MECKLENBURG) SS:

The undersigned, Christopher Bauer, Director Corporate Finance – Asset Treasurer, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.



Christopher Bauer Affiant

Subscribed and sworn to before me by Christopher Bauer on this 23rd day of January, 2023.





NOTARY PUBLIC

My Commission Expires: 03-01-24

VERIFICATION

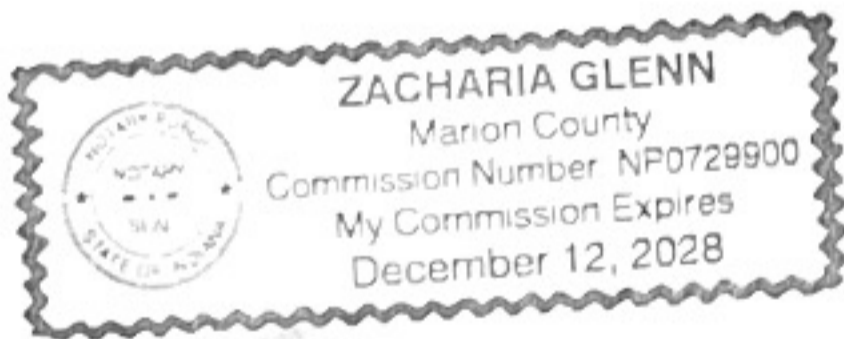
STATE OF INDIANA)
) SS:
COUNTY OF MARION)

The undersigned, Cormack C. Gordon, Director Transportation Electrification, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.


Cormack C. Gordon Affiant

Subscribed and sworn to before me by Cormack C. Gordon on this 21 day of January, 2023.

Zacharia Glenn
NOTARY PUBLIC



My Commission Expires: 12-12-2028

VERIFICATION

STATE OF INDIANA

COUNTY OF MARION

)
) SS:
)

The undersigned, Cormack C. Gordon, Director Transportation Electrification, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.


Cormack C. Gordon Affiant

Subscribed and sworn to before me by Cormack C. Gordon on this 21 day of January, 2023.

Zacharia Glenn
NOTARY PUBLIC



My Commission Expires: 12-12-2028

VERIFICATION

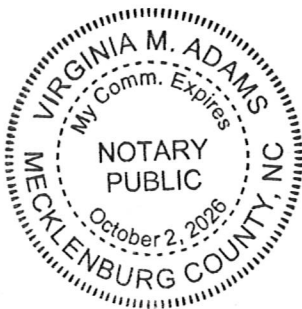
STATE OF NORTH CAROLINA)
) SS:
COUNTY OF MECKLENBURG)

The undersigned, Huyen C. Dang, Director of Accounting, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.



Huyen C. Dang Affiant

Subscribed and sworn to before me by Huyen C. Dang on this 19 day of 2023
2023.





NOTARY PUBLIC

My Commission Expires: 10/2/26

VERIFICATION

STATE OF NORTH CAROLINA)
) SS:
COUNTY OF MECKLENBURH)

The undersigned, Jacob Colley, Director Customer Services Strategy, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.



Jacob Colley Affiant

Subscribed and sworn to before me by Jacob Colley on this 20th day of January, 2023.





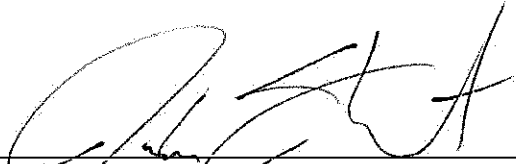
NOTARY PUBLIC

My Commission Expires: 03/22/2027

VERIFICATION

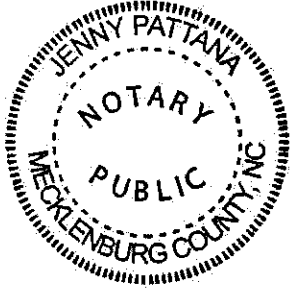
STATE OF North Carolina)
)
COUNTY OF Mecklenburg) SS:

The undersigned, Jacob Stewart, Director Health & Wellness, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.



Jacob Stewart Affiant

Subscribed and sworn to before me by Jacob Stewart on this 19 day of January 2023.





NOTARY PUBLIC

My Commission Expires: 06/08/2025

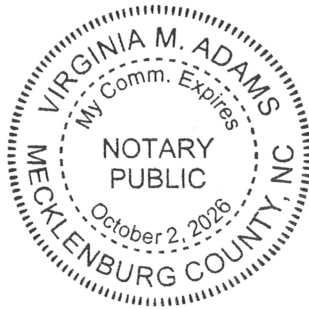
STATE OF NORTH CAROLINA
COUNTY OF MECKLENBURG

)
) SS:
)

The undersigned, John R. Panizza, Director, Tax Operations, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

John R. Panizza
John R. Panizza Affiant

Subscribed and sworn to before me by John R. Panizza on this 18 day of Jan., 2023.



Virginia M. Adams
NOTARY PUBLIC

My Commission Expires: 10/2/26

VERIFICATION

COMMONWEALTH OF)
MASSACHUSETTS)
) **SS:**
COUNTY OF MIDDLESEX)


The undersigned, Joshua C. Nowak, Vice President, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.



Joshua C. Nowak Affiant

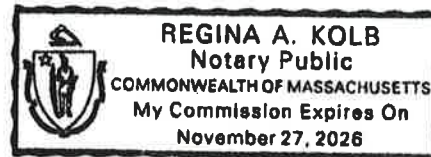
Subscribed and sworn to before me by Joshua C. Nowak on this 23rd day of January, 2023.





NOTARY PUBLIC

My Commission Expires: *Nov. 27, 2026*



VERIFICATION

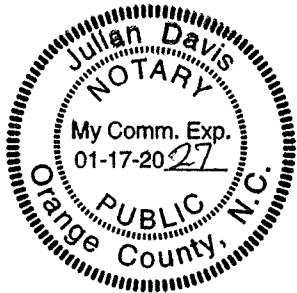
STATE OF North Carolina)
)
COUNTY OF Orange) SS:


The undersigned, Max W. McClellan, Lead Load Forecasting Analyst, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief



Max W. McClellan Affiant

Subscribed and sworn to before me by Max W. McClellan on this 20 day of 1, 2023.





NOTARY PUBLIC
My Commission Expires: 01/17/2027

VERIFICATION

STATE OF OHIO)
)
COUNTY OF HAMILTON) **SS:**

The undersigned, Michael Geers, Manager Environmental Services, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.


J. Michael Geers Affiant

Subscribed and sworn to before me by Michael Geers on this 24th day of January, 2023.


NOTARY PUBLIC

My Commission Expires: July 8, 2027



EMILIE SUNDERMAN
Notary Public
State of Ohio
My Comm. Expires
July 8, 2027

VERIFICATION

STATE OF NORTH CAROLINA)
) SS:
COUNTY OF MECKLENBURG)

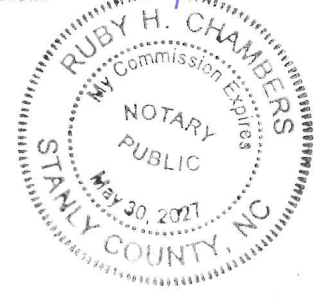
The undersigned, Paul Halstead, Director Jurisdictional Rate Administration, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief

Paul Halstead
Paul Halstead Affiant

Subscribed and sworn to before me by Paul Halstead on this 20th day of January, 2023.

Ruby H Chambers
NOTARY PUBLIC

My Commission Expires: May 30, 2027



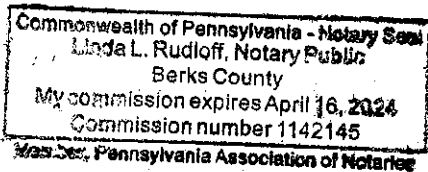
VERIFICATION

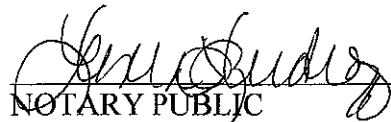
COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF BERKS)

The undersigned, Paul Normand, Principal, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief


Paul Normand Affiant

Subscribed and sworn to before me by Paul Normand on this 19 day of JAN,
2023.




NOTARY PUBLIC

My Commission Expires:
04.16.2024

VERIFICATION

STATE OF INDIANA)
) SS:
COUNTY OF TIPPECANOE)

The undersigned, Retha Hunsicker, VP Customer Experience Design and Solutions, being duly sworn, deposes and says that she has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of her knowledge, information and belief


Retha Hunsicker Affiant

Subscribed and sworn to before me by Retha Hunsicker on this 18 day of January, 2023.



Taylor Miller, Notary Public
Carroll County, State of Indiana
Commission No: NP0717053
My Commission Expires 11/18/2026


NOTARY PUBLIC

My Commission Expires: 11/18/2026

VERIFICATION

STATE OF S.C.)
)
COUNTY OF York) SS:

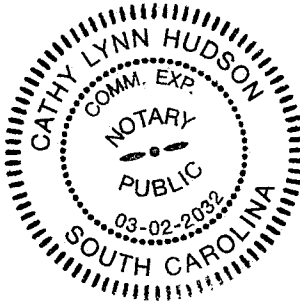
The undersigned, Ron Adams, GM Transmission Vegetation, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief

[Signature]
Ron Adams Affiant

Subscribed and sworn to before me by Ron Adams on this 18th day of JAN.,
2023.

[Signature]
NOTARY PUBLIC

My Commission Expires: 03-02-2032



VERIFICATION

STATE OF OHIO)
)
COUNTY OF HAMILTON) **SS:**

The undersigned, Sarah E. Lawler, VP Rates & Regulatory Strategy OH/KY, being duly sworn, deposes and says that she has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of her knowledge, information and belief



Sarah E. Lawler Affiant

Subscribed and sworn to before me by Sarah E. Lawler on this 17th day of January, 2023.



NOTARY PUBLIC

My Commission Expires: July 8, 2027



EMILIE SUNDERMAN
Notary Public
State of Ohio
My Comm. Expires
July 8, 2027

VERIFICATION

STATE OF OHIO)
) SS:
COUNTY OF HAMILTON)

The undersigned, Dominic Melillo, Director Asset Management, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

Dominic Melillo

Dominic Melillo Affiant

Subscribed and sworn to before me by Dominic Melillo on this 18th day of January, 2023.

Emilie Sunderman

NOTARY PUBLIC

My Commission Expires: July 8, 2027



EMILIE SUNDERMAN
Notary Public
State of Ohio
My Comm. Expires
July 8, 2027

VERIFICATION

STATE OF OHIO)
)
COUNTY OF HAMILTON) **SS:**

The undersigned, James E. Ziolkowski, Director, Rates & Regulatory Planning, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.



James E. Ziolkowski Affiant

Subscribed and sworn to before me by James E. Ziolkowski on this 24th day of January, 2023.



NOTARY PUBLIC

My Commission Expires: July 8, 2027



EMILIE SUNDERMAN
Notary Public
State of Ohio
My Comm. Expires
July 8, 2027

KyPSC Case No. 2022-00372
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REQUEST:

Refer to the Application, page 15, paragraphs 25–26.

- a. Explain why these costs qualify for regulatory asset treatment.
- b. Explain whether Duke Kentucky proposes that the revenues associated with these tariffs will also be deferred. If not, explain why not.

RESPONSE:

- a. Please see the Direct Testimony of Danielle L. Weatherston beginning on page 6, Line 19 through page 9, Line 19.
- b. As outlined in the Direct Testimony of Sarah E. Lawler and Danielle L. Weatherston, the regulatory asset being requested for the placeholder Rider GTM is for any remaining net book value not yet recovered from customers for assets that are retired. At the time of retirement, any remaining net book value associated with these retired assets would be moved to a regulatory asset. At the time that Rider GTM is put into rates, to the extent there are any revenues included in base rates associated with these assets, the Rider GTM would reflect a credit for those revenues to ensure no double recovery. But it would not be necessary to net revenues in the regulatory asset. The regulatory asset being requested for the new Rate RS-TOU-CPP is for lost revenues associated with that program. There are no revenues to be deferred. The regulatory asset being requested for Rate MRC is for costs to be deferred now and then amortized in a future base rate case. Any additional revenues generated from the result of electric vehicle adoption would also be included in that

future base rate case decreasing the revenue deficiency in that proceeding and therefore no offset is needed in the regulatory asset.

PERSON RESPONSIBLE: Sarah E. Lawler

REQUEST:

Refer to the Direct Testimony of Amy B. Spiller (Spiller Direct Testimony), page 4, lines 4–5, in which Duke Kentucky states that it is proposing to revise the fuel adjustment clause (FAC) mechanism to reduce volatility in customer rates

a. Explain why there are no proposed tariff sheet revisions to Rider FAC filed in the application.

b. Explain why proposed revisions to Rider FAC were not included in the customer notice.

RESPONSE:

At the time the Company made its filing, it did not believe that a change to the tariff was necessary as only the underlying support for the fuel cost would be changing in the Company’s proposal. Upon further review, the Company would agree that a change to the tariff could be made to section (1) for clarity and proposes that section to be written as follows:

- (1) The monthly amount computed under each of the rate schedules to which this fuel clause is applicable shall be increased or (decreased) at a rate per kilowatt-hour of monthly consumption in accordance with the following formula:

$$FuelCostAdjustment = \frac{F(12m\ average)}{S(12m\ average)} - \$0.025401\ per\ kWh$$

Where F is the expense of fuel for a rolling twelve month average ending with the second preceding month and S is the sales in the rolling twelve month average ending with the second preceding month as defined below:

PERSON RESPONSIBLE: Sarah E. Lawler

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-003

REQUEST:

Refer to the Spiller Direct Testimony, page 5, lines 12–14. The testimony indicates that Duke Kentucky is increasingly serving customers with underground facilities.

a. Provide the annual percentage amount of transmission and distribution facilities that Duke Kentucky has transitioned from above to below ground for the past five years.

b. Provide the percentage amount of transmission and distribution facilities that Duke Kentucky forecasts will be transitioned from above to below ground during the forecast year.

RESPONSE:

a. We do not specifically track facilities that are converted from overhead to underground. However, for the past five years the percentage of distribution overhead conductor has continued to decrease, and the percentage of distribution underground conductor has continued to increase. Duke Energy Kentucky does not have any transmission underground conductor.

Duke Kentucky Electric Distribution	2018	2019	2020	2021	2022
Overhead %	70%	69%	69%	68%	68%
Underground %	30%	31%	31%	32%	32%

b. Although we don't have a forecast specific to the forecast year, it is reasonable to assume a similar trend moving forward as seen in the past five years.

PERSON RESPONSIBLE: Dominic "Nick" J. Melillo

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-004

REQUEST:

Refer to the Spiller Direct Testimony, page 30, line 1 through page 34, line 9, in which Duke Kentucky's updates to its local government fee tariff and the creation of the incremental local investment charge are discussed. Also, refer to the Commission's January 13, 2021 Order in Case No. 2020-00174,¹ in which the Commission denied similar revisions proposed by Kentucky Power Company (Kentucky Power). Explain how Duke Kentucky's proposals differ from Kentucky Power's proposals and explain why such differences warrant approval.

RESPONSE:

The Company's proposal is limited to situations where the Company must comply with a municipal ordinance/franchise that requires the Company to take action that is not voluntarily agreed to by the Company, is outside of its normal operations and is specific to that municipality, such as relocations and undergrounding. As the Commission noted in its above referenced order, the Commission's authority regarding franchises is limited; however, as determined by the Kentucky Supreme Court, the Commission maintains "plenary authority to regulate and investigate utilities and to ensure that rates charged are fair, just and reasonable under KRS 278.030 and KRS 278.040."²

¹ Case No. 2020-00174, *Electronic Application of Kentucky Power Company for (1) A General Adjustment of its Rates for Electric Service; (2) Approval of Tariffs and Riders; (3) Approval of Accounting Practices to Establish Regulatory Assets and Liabilities; (4) Approval of a Certificate of Public Convenience and Necessity; and (5) All Other Required Approvals and Relief* (Ky. PSC Jan. 13, 2021), Order at 95–96 and 103–104.

² Ky. PSC v. Commonwealth ex rel. Conway, 324 S.W.3d 373 (Ky. 2010).

The Commission in its March 14, 2018, Order in Case No. 2016-000317³ similarly distinguished between a municipality's right to require a franchise and impose related costs on the utility (there a franchise fee) and the Commission's jurisdiction to determine how such costs imposed on a utility by a municipality are to be recovered:

[A] municipality's power to grant a franchise is not absolute. ... Significant to this case, the legislature's enactment of Public Service Commission Act of 1934 ("PSC Act") also restricts municipalities' franchise powers. The PSC Act conferred exclusive jurisdiction over utility rates and service to the Commission and empowered the Commission to change any rate fixed by a city pursuant to a franchise. ... [I]t is well-settled Kentucky law that the Commission has exclusive jurisdiction over the rate and services of a utility and that jurisdiction extends to the regulation of a *rate or service standard* fixed by a franchise between a utility and a city.⁴

The Company's request in this proceeding pertains to rate making, not the award of franchises or the contents of a city's proposed franchise. In the absence of contrary perpetual or other preexisting contractual rights, the Company's ability to negotiate with a municipality with respect to facility relocation and undergrounding is limited insofar as KRS 96.050 authorizes the legislative body of a city to do a number of things by ordinance, including:

(9) Compel gas and electric light companies and all persons using, controlling, or managing electric light wires for any purpose to change and relocate poles, electric wires, conduits for electric wires, gas mains and pipes, place those above the surface of the ground below it, change the method of conveying light, and generally to do things conducive to the safety and comfort of the inhabitants of the city in the premises.⁵

See similarly KRS 96.060(2).

³ Case No. 2016-00317, *Electronic Application of Louisville Gas and Electric Company for a Declaratory Order Regarding the Proper Method of Municipal Franchise Fee Recovery* (Ky. PSC Mar. 14, 2018), Order.

⁴ *Id.*, at 23 (emphasis added).

⁵ KRS 96.050(9).

In contrast to the circumstances presented in the Kentucky Power case, Duke Energy Kentucky is facing a real scenario where municipalities are exercising or threatening to exercise claimed authority under Kentucky law to compel the Company to relocate facilities underground at substantial expense. The cost-causers/persons who directly benefit from such a city-ordered relocation (*i.e.*, the residents who are the customers within the municipality) should pay the expense of the undergrounding of the facilities to serve them. The costs of relocation of facilities should not be socialized to all Duke Energy Kentucky's customers. Just like the costs of franchise fees or other local taxes or fees that might be levied by a municipality upon a utility, such relocation costs "represent[] an identifiable part of the cost of providing service within a municipality's boundaries and, therefore, should be recovered from those receiving that service."⁶ As such, "a uniform system should be adopted to recover these costs fairly with respect to the entire customer body."⁷

Recovery of these relocation costs from all customers through base rates would give an unreasonable preference or advantage to persons residing within the municipality and subject persons not residing within the municipality to an unreasonable disadvantage because those customers receive no benefit from the relocation. By clarifying now that such costs of relocation, if ultimately directed by the municipality by ordinance, may be charged directly to the municipality and the customers only in that municipality, municipalities will factor that into their decisions whether and to what extent overhead utility facilities could and should be relocated underground. Otherwise municipalities will seek to benefit their citizens at the expense and to the detriment of other ratepayers who

⁶ Case No. 2016-00317, Order at 24 (citing Case No. 7804, *Kentucky Utilities Company* (Ky. PSC Oct. 1, 1980).

⁷ *Id.*, at 25 (quoting Case No. 7843, *The Local Taxes and/or Fees Tariff Filing of General Telephone Company of Kentucky* (Ky. PSC Oct. 3, 1980), Order at 2.

are not residents of the municipality by forcing substantial costs incurred to benefit a single municipality on ratepayers systemwide. Rates will increase for all customers. Rate cases will become more frequent.

The Franchise Ordinance included in Attachment ABS-5, if enacted, notwithstanding any legal challenges that may follow as to its validity, and assuming it is ultimately upheld, states, among other things, that:

- “Whereas public necessity and convenience mandates locating of all electric utility lines underground for aesthetic, safety and development reasons.⁸
- the Company *shall* relocate *all* overhead distribution and transmission facilities within the boundaries of the municipality underground within three years;⁹
- the Company, “*at no cost to the Government*, place facilities underground if said above-ground facilities cause a public safety concern or are required to be placed underground pursuant to federal, state or local laws or regulation;”¹⁰

Through paragraph four of the Ordinance, the City declares that safety, aesthetics, and development require it to take action to order the Company to underground its entire distribution system over three years, and that the relocation should be at “no cost” to the City.

Just as with franchise fees and other local taxes and fees, the possibility that a municipality could force these local relocation costs upon the Company and ultimately

⁸ Direct Testimony of Amy B. Spiller, Attachment ABS-5 pg. 2, paragraph 4.

⁹ *Id.*, pg. 14, Section 16(d).

¹⁰ *Id.*, pg. 16.

ratepayers systemwide requires “a uniform system ... to recover these costs fairly with respect to the entire customer body.”¹¹ The Commission’s longstanding ratemaking treatment of locally-imposed costs warrants approval of the Company’s updates to its local government fee tariff and the creation of the incremental local investment charge.

PERSON RESPONSIBLE: Amy B. Spiller

¹¹ Case No. 2016-00317, Order at 25.

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-005

REQUEST:

Refer to the Spiller Direct Testimony, Attachments ABS-4 and ABS-5. Explain whether either of these ordinances were passed by the city of Covington. If not, provide an update on the status of the proposed ordinance.

RESPONSE:

Objection to the extent this request seeks information that is protected by the doctrines of Attorney Client Privilege and Attorney Work Product. Without waiving said objection, the Ordinance in Attachment ABS-4 was passed by the City of Covington and signed by the Mayor on or about December 20, 2022. The Franchise Ordinance contained in Attachment ABS-5 has not *yet* been passed by the City.

PERSON RESPONSIBLE: As to objection, Legal
 As to response, Amy B. Spiller

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-006

REQUEST:

Refer to the Direct Testimony of Christopher R. Bauer (Bauer Direct Testimony), page 13.

a. Referring to lines 1–2, explain whether other Duke Energy regulated affiliates have been unable to issue debt in the private markets and, if so, identify who issued the debt in each transaction.

b. Referring to lines 9–10. Due to the private markets being less liquid, explain whether the interest rates paid are higher than in the public markets. If so, describe how this impacts the expense related to the debt.

c. Explain why Duke Kentucky prefers to issue debt through the private markets as opposed to the public markets.

d. Explain what the public markets are and how they function relative to the private markets, including differences in federal and state regulation.

e. Explain how the public markets are taxable debt markets and the private markets are non-taxable.

RESPONSE:

a. Duke Energy Kentucky is the only regulated affiliate that issues debt in the private markets. Duke's other regulated affiliates issue bonds in the public markets.

b. While not always the case, bond coupons can be higher in the private bond market. In private bond placements, issuance sizes are smaller (non-index eligible) and trade less frequently with fewer market participants, which typically results in a smaller

pool of dedicated buy-and-hold investors and gives the company less pricing leverage as compared to a public transaction. In the public market, if investors no longer desire to hold their position, they are able to trade out of it, whereas private placement investors do not have that luxury and therefore may require a higher coupon to reflect that added risk (illiquidity premium). However, there are also times when private market pricing is better than what could be achieved in the public market for a small deal size. The private market also offers certain advantages that the public market does not. For example, issuance costs are typically lower, ratings from the rating agencies are not required, there is no premium for deal size, custom features (such as delayed draws) are available, and off-the-run tenors are widely available that best fit into Duke Energy Kentucky's maturity stack and provide an opportunity to take advantage of the most efficient parts of the curve in terms of pricing.

c. Due to the size of Duke Energy Kentucky's offerings (less than \$300 million), the bonds are not index-eligible so the most efficient means to market and price the bonds is the private market.

d. The public bond market is a marketplace where investors buy, sell and trade debt securities that are brought to market by governmental entities or corporations. In the public bond market, index-eligible bonds (investment grade, \$300 million minimum par outstanding) are assigned credit ratings by the agencies and issued on the primary market, or are traded on the secondary market, so market prices are readily available. By comparison, the private bond market typically consists of buy-and-hold investors, the bonds are not typically rated by the agencies or traded, and there is no readily observable market price for the bonds. Other differences between the public and private markets are public offerings are announced and priced the same day, while private offerings typically have a multi-week marketing period consisting of one-on-one investor calls. While both

public and private markets are regulated by the SEC, publicly offered bonds must be registered with the SEC while private offerings are exempt from this requirement.

e. Both the public and private markets are taxable (not to be confused with the tax-exempt municipal market).

PERSON RESPONSIBLE: Christopher R. Bauer

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-007

REQUEST:

Refer to the Bauer Direct Testimony, page 18 and Volume 10, Schedule J-2, pages 1–2.

a. Explain how the sale of accounts receivable works and why that is considered a short-term debt. Include in the response whether a corporate parent or affiliate is purchasing the accounts receivable.

b. Refer to page 18, lines 1–2 of the Bauer Direct Testimony. Explain the how the addition of the 85-basis points was derived and why it is appropriate to add that to the one-month Term Secured Overnight Financing Rate (SOFR).

c. Explain why the SOFR rate is applied to the sale of accounts receivable and not the one-month London Interbank Offered Rate (LIBOR).

d. For the two loans listed under the heading Current Maturities, explain whether the listed interest rates are those that Duke Kentucky is actually paying. If not, explain how the interest rates were derived and provide any supporting documentation.

RESPONSE:

a. Duke Energy Kentucky sells on a revolving basis certain accounts receivable arising from the sale of electricity, natural gas and related services to Cinergy Receivables Company (CRC), an affiliate of Duke Energy Kentucky. These receivables are both billed and unbilled. These receivables are sold at a discount and without recourse. CRC borrowed amounts under a credit facility to buy the initial pool of receivables from the Company, resulting in a short-term liability being recorded. Borrowing availability

from the credit facility is limited to the amount of qualified receivables sold to CRC, which generally exclude receivables past due more than a predetermined number of days and reserves for expected past-due balances. When the amount of qualified receivables exceeds the credit facility limit, no additional funds are received by Duke Energy Kentucky. For any month in which the amount of qualified receivables is less than the credit facility limit, Duke Energy Kentucky funds a repayment of the outstanding CRC loan based on its pro rata share of the deficiency based on outstanding receivables. In subsequent months when the amount of qualified receivables meets or exceeds the credit facility limit, Duke Energy Kentucky receives proceeds up to its pro rata share of the credit facility limit based on outstanding receivables. Duke Energy Kentucky services these receivables and receives a collection fee monthly. Accounts payable and accounts receivable are classified as current on the balance sheet.

b. A credit spread, representing a company's incremental borrowing risk, is typically applied to a risk-free benchmark rate when determining a company's borrowing costs. During 2022, amendments were executed to the receivables financing arrangement that converted the interest rate from a LIBOR-based rate to 1-month Term SOFR + 15 bps (SOFR Spread Adjustment) + 70 bps (credit spread). Both the SOFR Spread Adjustment and credit spread were negotiated with banks included in all of Duke Energy's accounts receivable securitization programs to ensure market rates were obtained

c. LIBOR rates will cease to be published as of 6/30/2023, therefore the company amended the prior agreement to use a benchmark interest rate of SOFR instead of LIBOR. In 2022, the LIBOR Act was passed by US Congress, and it established SOFR as a default replacement rate for LIBOR contracts.

d. For the \$25 million 4.01% bond, that is the fixed interest rate in which the company is actually paying. For the \$50 million SOFR term loan, a forecasted interest rate is being provided (plus credit spread) since this is a floating rate loan and floating rates were anticipated to increase significantly (and have) when the schedule was compiled.

PERSON RESPONSIBLE: Christopher R. Bauer

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-008

REQUEST:

Refer to the Bauer Direct Testimony, page 18, lines 13–14 and Volume 10, Schedule J-2, pages 1-2. Explain why the LIBOR rate is applicable to notes payable to associated companies.

RESPONSE:

LIBOR has historically served as a good benchmark in forecasting floating interest rates. Duke's commercial paper/moneypool arrangements utilize interest rates in which forecasts are not derived or published in Bloomberg, so a floating rate benchmark such as LIBOR is used as a proxy for forecasting purposes.

PERSON RESPONSIBLE: Christopher R. Bauer

REQUEST:

Refer to the Bauer Direct Testimony, page 18, lines 15–23, page 19, line 1 and Volume 10, Schedule J-3, pages 1–2.

a. Explain the Bloomberg implied forward curve and whether there are other forecasted forward rates that could have been used. If there are other forecasted forward rates, explain why they were not utilized.

b. For the base and forecast period for long term commercial paper, explain why the 25-basis point spread is added to the interest rate and why that is appropriate.

c. For the expected \$130 million, explain the appropriateness of using a weighted average of 5-year, 10-year, and 30-year Treasury rates plus the respective basis point adders. Include in the response how each respective adder was derived.

d. Duke Kentucky has a \$65 million debenture at a 6.2 percent interest rate. Explain why this was not refinanced in the past two years at a lower interest rate.

RESPONSE:

CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachment only)

a. Bloomberg uses market data, including real-time trades, to derive an implied forward curve. The forward curve is meant to be indicative of where future rates are expected to be based on current market data and activity. While there are other forward rate forecasts that are available, Bloomberg is widely regarded as the market standard and the system in which Duke utilizes to pull market data and forward curves.

b. The 25 basis point credit spread used for the Company’s LT Commercial Paper rate is the estimated credit spread over LIBOR for the Company’s Commercial Paper borrowings over time. Historically, the Company’s Commercial Paper rate versus 1 month LIBOR supports using a credit spread in this range. See below for a quarterly comparison of 2022 rates:

<u>Date</u>	<u>Wtd Avg CP Rate</u>	<u>1M LIBOR</u>	<u>Difference</u>
3/31/2022	0.68%	0.45%	0.23%
6/28/2022	1.79%	1.66%	0.13%
9/30/2022	3.36%	3.14%	0.22%
12/30/2022	4.61%	4.39%	0.22%

c. The Company compiles forecast LTD rates by weighting the 5Y, 10Y and 30Y US Treasuries plus a credit spread for each of those tenors. The forecasted average life of Duke Energy Kentucky's debt portfolio is ~ 19 years as of the base period. The weighting of the 5Y, 10Y and 30Y US Treasuries (plus credit spreads) is reflective of the ~19 year average of the LTD portfolio as of the base period. Please refer to STAFF-DR-02-009(c) Confidential Attachment for support of how the company calculated the forecasted LTD rate.

d. Generally speaking, the most efficient way to refinance long-term debt is to allow the debt to mature according to its terms and to re-issue the debt at the then prevailing market rate. The Company chose not to refinance the \$65 million 6.2% bond prior to maturity as redeeming debt that early is expensive and cost prohibitive. Standard terms of these borrowing arrangements specify that investors must be made whole in the event that the company decides to redeem the debt early. These make-whole premiums would have to be included in the refinancing and would increase total leverage in the capital structure. In this situation, the 6.2% bond was issued in 2006 and matures in 2036. If the Company were to redeem this debt early, it would be required to pay investors a lump sum payment

of the net present value of ~13 years' worth of interest payments at 6.2% in addition to the \$65 million principal. Under this scenario, the Company would not only be required to refinance the debt, but it would also be required to finance the costs of making ~13 years' worth of interest payments early.

PERSON RESPONSIBLE: Christopher R. Bauer

**CONFIDENTIAL PROPRIETARY TRADE
SECRET**

**STAFF-DR-02-009 (c)
CONFIDENTIAL ATTACHMENT**

FILED UNDER SEAL

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-010

REQUEST:

Refer to the Direct Testimony of Jacob S. Colley (Colley Direct Testimony), page 14, line 10–14, in which the proposed change to the late payment charge is discussed.

a. Explain whether gas customers who pay late will still be charged the 5 percent late payment penalty for the portion of their bill pertaining to gas.

b. Explain whether any adjustment to Miscellaneous Service Revenues was made for the reduction in the late payment charge. If so, provide the adjustment and how it was calculated. If not, explain why not.

RESPONSE:

a. No. Upon the Commission’s order in this proceeding, the Company intends to submit revised gas tariff sheets with the revised late payment charge.

b. No adjustment was made to Miscellaneous Service Revenues. Please see response to AG-DR-01-094(d). Due to the sale of the Company’s receivables, late payment charge revenues are not retained by the Company and are not part of the Company’s Schedule M revenue proof. They are factored into the discount rate that Duke Energy Kentucky sells the receivables.

PERSON RESPONSIBLE: Bruce L. Sailors

REQUEST:

Refer to the Colley Direct Testimony, Attachment JSC-1.

a. Explain whether the information in Attachment JSC-1 pertains solely to residential late paying customers. If so, explain why non-residential late paying customer information was not included given that Duke Kentucky is proposing to reduce the non-residential late payment penalty to 2.3 percent.

b. Provide a detailed explanation of how the average monthly carrying cost per late paying account was calculated.

c. Provide a detailed explanation of how the phone cost per minute of \$0.92 was calculated.

d. Explain whether the estimated total call handle time (in minutes) only includes time spent corresponding with late paying customers or if it also includes time spent corresponding with all customers.

RESPONSE:

a. In accordance with Order No. 2021-00190 in the Duke Energy Kentucky gas rate case, Duke Energy Kentucky was to file formal cost support for the appropriate residential late payment charge in accordance with Commission regulations. The information provided in Attachment JSC-1 was to comply with this order. Thus, the analysis performed included Kentucky residential customers only.

b. The calculation of carrying cost is derived with the following formula:
Average monthly carrying cost = ((Average KY Residential Current Month Past Due Balance)*(TVM interest rate))/(12).

Notes:

- The average Current Month Past Due Balance represents the average of the current month charges that are past due plus all prior period charges in arrears. The average current month balance due was \$188 for the time period used in the analysis (March 2021-February 2022).
- The TVM interest rate represents the 13-month average of the forward rate of SOFR + 85 bps from Bloomberg. This data was pulled in October 2022 for the 13 months leading up to the effective date of new rates to represent what the rate would be at the time collection would occur.

c. The cost of each call per minute is computed as follows: Total Call Center Costs / (Volume of calls) x (Average Handle Time)

Total call center costs includes employee and vendor agents, call center management, and training. \$0.92 was based on a 3-month average from June through August 2022.

d. The analysis included the estimated total call handle (in minutes) for customers that authenticated in the Interactive Voice Response (IVR) system or mentioned late paying billing topics when describing their reason for calling to the IVR system.

PERSON RESPONSIBLE: Jacob S. Colley

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-012

REQUEST:

Refer to the Direct Testimony of Cormack C. Gordon (Gordon Direct Testimony), page 4 and Attachment CCG-2. Explain how the electric vehicle counts were forecasted.

RESPONSE:

Duke Energy Kentucky's Electric Vehicle (EV) forecast is derived using the Vehicle Analytics and Simulation Tool (VAST) produced by Guidehouse and is produced at a jurisdictional level. Multiple variables/parameters are accounted for when developing the EV adoption forecast including historical registration data, vehicle utilization characteristics, projections of battery and other vehicle costs, vehicle availability, vehicle miles traveled, charging infrastructure availability, and consumer acceptance.

PERSON RESPONSIBLE: Cormack C. Gordon

REQUEST:

Refer to the Gordon Direct Testimony, page 5 and Attachments CCG-3 and CCG-4.

- a. Explain which provisions are intended to encourage electric vehicle adoption for apartment and condominium complexes.
- b. Explain whether a charger rented under Electric Vehicle Supply Equipment (EVSE) will be able to be billed to third party users if installed in a shared space.

RESPONSE:

Attachment CCG-3 does not apply to apartment and condominium complexes.

- a. Both the MRC and EVSE programs simplify the installation of charging equipment in the parking areas by making those installations more affordable. MRC provides funding to offset the cost of bring electricity from existing infrastructure to the location of EV chargers. The EVSE program eliminates upfront charging station hardware costs, which can be significant when installing multiple charging stations as well as the uncertainty and burden of maintenance. The draft contractual terms for these benefits are outlined in Sections 1, 4, and 6 of Attachment CCG-4. In addition, the expertise of program personnel is available to assist multi-unit dwelling customers in configuration of charging systems (hardware plus software), understanding of any necessary utility upgrades, and installation the customer-selected charger (Attachment CCG-4, Section 1.2).

b. To the extent that a “shared space” refers to an individual parking space that is not assigned, deeded, or otherwise reserved to a specific individual or entity, the following apply.

- The property owner must give approval for installation.
- A single active electric utility account must be accountable for, in addition to inherent electrical usage, monthly program “rental” charges. There are no proposed program terms and conditions that prevent the accountable entity from seeking reimbursement from one or more others that utilize any charger obtained through the EVSE program but shared among multiple EV drivers.

Another notable feature of the EVSE program is that the entity accountable for monthly charges also has discretion regarding access control and to set pricing for use of the charger. To that end, for example, a multi-unit dwelling management entity can assess fees to be charged to users in order to recoup costs of the charging system. The Company, through networking software providers, facilitates collection and remittance of those fees, but otherwise remains only an enabler in the relationship between management entity and resident.

PERSON RESPONSIBLE: Cormack C. Gordon

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-014

REQUEST:

Refer to the Gordon Direct Testimony, page 11, line 20 through page 12, line 2, in which it is stated that the Make Ready Credit and Electric Vehicle Supply Equipment programs will deliver a benefit to all utility customers by lowering the per unit cost of electricity associated with new electric vehicle charging load. Explain this statement.

RESPONSE:

Electric vehicle adoption presents an opportunity for downward pressure on electric rates. The majority of EV charging occurs in residential settings and, especially when managed, can be made to occur during hours when the electric system is not constrained. As a result, system costs can be managed as well as spread over more kilowatt-hour sales. The Make Ready Credit and Electric Vehicle Supply Equipment programs enable this benefit both by simplifying the adoption of EVs – the technological scenario necessary for this downward rate pressure – and by setting the stage for future customer adoption of managed charging programs.

PERSON RESPONSIBLE: Cormack C. Gordon

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-015

REQUEST:

Refer to the Gordon Direct Testimony, page 14, lines 12–14, page 17, lines 12–15, and page 18, lines 10–20. Explain why Duke Kentucky chose the estimated aggregate increase in electric revenue for the first three years following the installation of the charger as the appropriate target for the Make Ready Credit.

RESPONSE:

The Make Ready Credit program is modeled after the Line Extension Policy (Rider X), which determines revenue credits associated with new load additions to the electric system. This is the basis for choosing the three-year estimated increase in electric revenue to support customer adoption of EVs.

PERSON RESPONSIBLE: Cormack C. Gordon

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-016

REQUEST:

Refer to the Gordon Direct Testimony, page 15, lines 4–6, in which it is stated that demonstrated costs shall not include any amounts for which the customer expects coverage or reimbursement from a third-party funding source. Explain how Duke Kentucky will confirm that the amounts submitted by the customer were not covered or reimbursed from a third-party source.

RESPONSE:

The program application requires the customer of record disclose any third-party funding used in respect to the make ready infrastructure along with the funding party and amount. The customer must also agree to the program terms and conditions which state the customer must cooperate with Duke Energy Kentucky and provide the Company with additional information or documents that Duke Energy Kentucky reasonably requires to determine customer's eligibility to participate in the Program or confirm the accuracy of the information provided. The terms and conditions also state the customer certifies that the information provided in the application is true and correct, and the customer understands that if any of the information provided is discovered to be false, the customer may be required to pay back any credits remitted by Duke Energy Kentucky under the program.

PERSON RESPONSIBLE: Cormack C. Gordon

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-017

REQUEST:

Refer to the Gordon Direct Testimony, page 19, lines 12–20. Explain why the Make Ready Credit program was not proposed as a demand side management program.

RESPONSE:

The Make Ready Credit program (MRC) extends concepts of the line extension policy to assist customers installing make ready infrastructure in an affordable and reliable manner, thus simplifying EV adoption.

MRC is not an energy efficiency nor a demand response program. However, MRC, as well as the proposed EVSE program, set the stage and serve as enablers for future EV load management programs, which may be categorized as demand side management program(s).

PERSON RESPONSIBLE: Cormack C. Gordon

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-018

REQUEST:

Refer to the Gordon Direct Testimony, page 20. For each credit amount, provide the total estimated cost of the make ready work and the charger.

RESPONSE:

The basis of credit amounts for the Make Ready Credit program (MRC) is not estimated customer costs. Rather than contemplate costs as the primary driver, MRC credit amounts reflect the value of the new revenue introduced to the system. The program also excludes the costs of EV chargers as eligible “demonstrated costs.” Those fundamental program design aspects notwithstanding, the estimated cost of make ready work varies substantially with each segment depending on the complexity of the EV charger installation. Particularly for non-residential use cases, the amount of make ready work required is site specific; therefore, it is impractical to provide accurate estimates. For single family home residential applications, there is more commonality across installations. Estimates for typical make ready work for the residential segment range from \$800 to \$1,200, though amounts both above and below this range are plausible for very simple and very challenging installations, respectively.

PERSON RESPONSIBLE: Cormack C. Gordon

REQUEST:

Refer to the Gordon Direct Testimony, Attachment CCG-3 and CCG-4, page 1, section 1.1.

- a. Provide examples of facilities that will be available under the “Extra Facilities” clause.
- b. Explain the ownership and maintenance responsibilities for these facilities.

RESPONSE:

a. Examples of Extra Facilities in the EVSE program are universal outdoor mounts, wood poles for mounting charging stations, universal pedestal mounts, charging station cable management and a concrete bollard installation. In addition, non-standard features – those that are different than as-filed configurations – that impact costs will be considered extra facilities. A few examples of non-standard features would be upgraded charging cables, advanced user interfaces, and modification of charging plug types. This approach also allows flexibility for any future options that become available and other features that customers may request for their specific needs.

b. As is the case for standard hardware options, Duke Energy will own and maintain extra facilities throughout the term of the agreement with the customer.

PERSON RESPONSIBLE: Cormack C. Gordon

Duke Energy Kentucky
East Bend and Woodsdale (Production Assets, excluding AROs)
Estimated Net Book Value (Life)
(with current expected retirement date of June 2035 for East Bend and June 2040 for Woodsdale)

1. Based on current depreciation rates (life only).

East Bend	\$	252,906,511
Woodsdale	\$	38,333,616

2. Based on proposed depreciation rates (life only).

East Bend	\$	17,028,918.79
Woodsdale	\$	4,098,046.57

Notes:

Gross Plant and Life Reserve balance as of Nov'22
Assumed zero additions and retirements after Nov'22

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-020

REQUEST:

Refer to the Direct Testimony of Sarah E. Lawler (Lawler Direct Testimony), page 5. Provide the expected remaining net book value and supporting calculations for East Bend and Woodsdale at their currently expected retirement dates if they are depreciated at the current rates and if they are depreciated at the proposed rates.

RESPONSE:

Please see STAFF-DR-02-020 Attachment.

PERSON RESPONSIBLE: Huyen C. Dang

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-021

REQUEST:

Refer to the Lawler Direct Testimony, page 14, lines 21–22.

a. Explain how Duke Kentucky’s proposed changes to its Rider FAC mechanism comply with 807 KAR 5:056, Section 1(3) which states that “Fuel costs (F) shall be the most recent actual monthly cost, based on weighted average inventory costing”.

b. Also, refer to the Commission’s April 27, 2020 Order in Case No. 2019-00271.¹ In that April 27, 2020 Order, the Commission denied Duke Kentucky’s proposed modifications to its Rider FAC mechanism that would change the rate calculation from a monthly basis to a rolling twelve-month average. Is this the same change to its Rider FAC in this case as was proposed in Case No. 2019-00271? If so, explain the factors that led to Duke Kentucky proposing the same change to its Rider FAC in this case given that the Commission denied Duke Kentucky’s previous proposal based on the FAC regulation pursuant to 807 KAR 5:056, Section 1. If it is not the same change, please explain the differences.

RESPONSE:

a. The Company understands that 807 KAR 5:056, Section 1(3) states that “Fuel costs (F) shall be the most recent actual monthly cost, based on weighted average inventory costing.” The Commission may grant waivers of regulations for good cause if necessary. The Commission has allowed utilities to spread out the costs of fuel expense

¹ Case No. 2019-00271, *Electronic Application of Duke Energy Kentucky, Inc. For 1) An Adjustment Of The Electric Rates; 2) Approval of New Tariffs; 3) Approval of Accounting Practices To Establish Regulatory Assets And Liabilities; And 4) All Other Required Approvals And Relief* (Ky. PSC Apr, 27, 2020) at 63.

recovery over multiple months to avoid significant rate spikes and mitigate volatility in the past. Therefore, the Commission has the authority to do what the Company is requesting, which is on a more permanent basis. The Company understands that the Commission has opened an administrative case to seek comments on proposed revisions to the FAC (Case No. 2022-00190) and would encourage the Commission to make any necessary modifications to the regulation in that proceeding.

b. Yes. This is the same change to its Rider FAC mechanism that the Company proposed in Case No. 2019-00271. Given the increased volatility in the customer rate since the time of the Company's last request as described in my Direct Testimony, the Company believes that it is in the best interest of customers to revisit the proposal. The Company's proposal will reduce customer bill volatility.

PERSON RESPONSIBLE: Sarah E. Lawler

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-022

REQUEST:

Refer to the Direct Testimony of Paul Normand (Normand Direct Testimony) and Schedule B-5.1. Confirm that the lead/lag study does not include non-cash expenses.

RESPONSE:

Confirmed. The study does not include non-cash items.

PERSON RESPONSIBLE: Paul M. Normand

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-023

REQUEST:

Refer to the Direct Testimony of Joshua Nowak (Nowak Direct Testimony), page 22, Figure 4, and Attachment JCN-6: CAPM 2. Duke Energy Corporation Beta values as of October 2022 are 0.85 from Value Line and 0.733 from Bloomberg. OGE Energy Corporation's (OGE) Beta value is 1.05 from Value Line and 0.93 from Bloomberg. This stock appears to be significantly more volatile than Duke Energy Corporation's stock, which may indicate that the market perceives something about OGE that is not present in Duke Energy Corporation and that is not captured in the proxy group selection criteria. Explain why OGE should remain in the proxy group.

RESPONSE:

Duke Energy Kentucky is the subject company, not Duke Energy Corporation. As such, the Beta values for Duke Energy Corporation is not necessarily reflective of Duke Energy Kentucky's risk profile. Further, it is not necessary for the proxy companies have Beta coefficients that are similar to Duke Energy Corporation. The Beta coefficient for Duke Energy Corporation may be uniquely influenced by other factors. As described in Nowak Direct Testimony page 25, "A significant benefit of using a proxy group is the ability to mitigate the effects of short-term events that may be associated with any one company." To the extent that OGE is experiencing greater volatility than Duke Energy Corporation is not relevant.

The proxy group was selected to include companies with business and operating characteristics similar to the subject company and OGE met these criteria. Further, OGE's Beta coefficient, while the highest in the proxy group, does not suggest a cost of equity that is substantially different from the other proxy companies. OGE's CAPM result was approximately 100 to 200 basis points above the mean result. Compared to the variability in the DCF analysis, this is much closer to the mean result. In the DCF analysis, the high-end result was approximately 300 basis points above the mean result and the low-end result was more than 300 basis points below the low-end results. Therefore, there is no basis to exclude OGE from the proxy group.

PERSON RESPONSIBLE: Joshua C. Nowak

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-024

REQUEST:

Refer to the Nowak Direct Testimony, page 32, lines 5–7 and Attachment JCN-4. Attachment JCN-4 provides earnings growth rates coming from Value Line, Yahoo! Finance, and Zacks. The testimony lists Thompson First Call, not Yahoo! Finance. Explain the difference and provide an updated analysis, if necessary.

RESPONSE:

Yahoo! Finance refers to the source from which Mr. Nowak obtained the earnings growth rate estimates. Yahoo! Finance publishes Thomson First Call consensus growth estimates. Thomson First Call/Thomson ONE Analytics is a financial data service maintained by Refinitiv, which is the ultimate source of the growth rates referred to as “Yahoo! Finance” or “Thomson First Call” growth rates.

PERSON RESPONSIBLE: Joshua C. Nowak

REQUEST:

Refer to the Nowak Direct Testimony, page 4, Figure 1, and page 33, Figure 6. Explain how the mean and median DCF results in Figure 1 are derived from the DCF results in Figure 6.

RESPONSE:

The values included in page 4, Figure 1, and page 33; Figure 6 of Nowak's Direct Testimony are both derived from Attachment JCN-2.

The mean DCF result of 9.27 percent in Figure 1 is derived from the average of the mean DCF results of the 30-day, 90-day, and 180-day approaches in Figure 6. That is, 9.27 percent is the average of 9.48 percent, 9.19 percent, and 9.15 percent.

The median DCF result in Figure 1 cannot be derived from Figure 6 because Figure 6 does not displace the median results. However, the median result of 9.39 percent can be derived from Attachment JCN-2 by taking the average of the median the 30-day, 90-day, and 180-day results of 9.57 percent, 9.31 percent, and 9.27 percent.

PERSON RESPONSIBLE: Joshua C. Nowak

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-026

REQUEST:

Refer to the Nowak Testimony, page 36 and Attachment JCN-6: CAPM 2.

a. Footnote 2 referenced in Column O in Attachment JCN-6: CAPM 2 states that Bloomberg Beta values are derived from five years of weekly data based on the S&P 500 Index, but Attachment JCN-6: CAPM 2 does not explain what the Value Line Beta values are based upon. The testimony states that Bloomberg Beta values are based on ten years of weekly data based on the S&P 500 Index and that Value Line Beta values are based on five years of weekly data based upon the New York Stock Exchange Composite Index. Provide the source documentation explaining the derivation of both Value Line and Bloomberg Beta values and provide an update to the footnotes in Attachment JCN-6: CAPM 2.

b. Provide the number of companies comprising the New York Stock Exchange Composite Index.

c. In addition to Value Line and Bloomberg Beta values, explain why Yahoo! Finance Beta values, once adjusted, should not also be included in CAPM and risk premium analyses.

d. Provide an update to all analyses that include Yahoo! Finance adjusted Betas.

RESPONSE:

a. Bloomberg allows the analyst to select the time period, frequency, and comparative index when selecting Beta coefficients. Mr. Nowak selected ten years of weekly returns relative to the S&P 500 when estimating Beta from Bloomberg Professional. Footnote 2 in Attachment JCN-6 should be revised from “[2] Source: Bloomberg Professional, calculated based on **five** years of weekly returns, as of October 31, 2022” to “[2] Source: Bloomberg Professional, calculated based on **ten** years of weekly returns, as of October 31, 2022.” Please see STAFF-DR-02-026 Attachment 1 for documentation regarding Bloomberg’s methodology for estimating Beta.

For Value Line Beta estimates, Value Line relies on five years of weekly returns relative to New York Stock Exchange Composite Index. Please see page 36 of STAFF-DR-02-026 Attachment 2, which contains Value Line’s explanation of its derivation of Beta.

b. There are approximately 2,000 companies comprising the New York Stock Exchange Composite Index.

c. Mr. Nowak is not aware of Yahoo! Finance’s methodology for calculating Beta, including the reference index used and any adjustments made to its Beta estimates. However, Mr. Nowak is aware that Yahoo! Finance Beta estimates are based on five years of monthly returns. Five years of monthly returns, or 60 total observations, may not produce a statistically robust relationship for estimating Beta so they should not be included in the CAPM analysis.

d. Mr. Nowak does not have the requested Yahoo! Finance Beta estimates consistent with the date of his cost of equity analyses and therefore has not performed the requested calculations. Further, as described in subpart (c), Mr. Nowak has concerns about the statistical reliability of Yahoo! Finance Beta estimates.

PERSON RESPONSIBLE: Joshua C. Nowak



BETA, HRA, and CORR Calculation FAQs

This document contains additional explanations about calculations and special data adjustments performed in functions BETA, HRA, and CORR.

The topics covered are:

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 - 1.1 Linear Regression 2
 - 1.2 BETA +/- Regression 3
 - 1.3 Adjustment of Missing Points for BETA and HRA..... 4
 - 1.4 Origin of the Adjusted BETA Formula 5
- 2 CORR** 6
 - 2.1 Calculations..... 6
 - 2.2 Adjustment of Missing Points for CORR..... 6
 - 2.3 CORR Order of Operations 7
 - 2.4 Differences between CORR and HS..... 7
- 3 Importing Data to Microsoft Excel**..... 9
- 4 Comparing BETA with FLDS and Excel**..... 9

Bloomberg

BETA, HRA, and CORR Calculation FAQs
 Page 2

1 BETA and HRA

1.1 Linear Regression

This section covers the main calculation formulae used in BETA and HRA.

X = independent variable (price values for security 2)

Y = dependent variable (price values for security 1)

Note: In BETA and HRA, x and y are percentage differences of the value of the securities by default.

$$x_i = \frac{X(i+1) - X(i)}{X(i+1)} \times 100, \quad y_i = \frac{Y(i+1) - Y(i)}{Y(i+1)} \times 100$$

Raw BETA =
$$\frac{n \sum xy - \sum x \sum y}{n \sum x^2 - \sum x \sum x}$$

Adjusted BETA =
$$(0.66666 * \text{Raw BETA}) + (0.33333 * 1)$$

ALPHA =
$$\frac{\sum y - \text{RAW BETA} \sum x}{n}$$

R² =
$$\frac{(n \sum xy - \sum x \sum y)^2}{(n \sum y^2 - \sum y \sum y)(n \sum x^2 - \sum x \sum x)}$$

Standard Deviation Error =
$$\sqrt{\frac{\sum y^2 - \text{ALPHA} \sum y - \text{RAW BETA} \sum xy}{n-2}}$$



Std Error of Alpha = Standard Deviation Error / AlphaFactor

$$\text{Where: AlphaFactor} = \sqrt{n - \frac{\sum x \sum x}{\sum x^2}}$$

Std Error of Beta = Standard Deviation Error / BetaFactor

$$\text{Where: BetaFactor} = \sqrt{\sum x^2 - \frac{\sum x \sum x}{n}}$$

Number of Points = Number of data points for the calculation
 (For percent diff/diff, number of points= n-1,
 where n is number of days.)

1.2 BETA +/- Regression

The main formula used for calculating Beta+ and Beta- regression is the following equation:

$$\begin{bmatrix} ALPHA \\ B1 \\ B2 \end{bmatrix} = \text{INVERSE} (Z Z') * (Z' Y)$$

$$\text{Where: } Y = \begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix} \quad Z = \begin{bmatrix} 1 & x_1 & |x_1| \\ \vdots & \vdots & \vdots \\ 1 & x_n & |x_n| \end{bmatrix}$$

BETA+ = B1 + B2

BETA- = B1 - B2

Avg Slope = (BETA+ + BETA-) / 2

Convexity = (BETA+ - BETA-) / 2



Std Deviation of Error = $\sqrt{\frac{\sum(E^2)}{n}}$

Where: $E = \begin{bmatrix} y_1 & -Alpha & -B1x_1 & -B2|x_1| \\ \vdots & \vdots & \vdots & \vdots \\ y_n & -Alpha & -B1x_n & -B2|x_n| \end{bmatrix}$

$R^2 = 1 - \frac{Variance(E)}{Variance(Y)}$

Where: $Variance(y) = \sqrt{\frac{\sum(Y_i - Avg(y))^2}{n}}$ $Variance(E) = \frac{\sum(E^2)}{n}$

1.3 Adjustment of Missing Points for BETA and HRA

When a data point is missing for one of the securities but not the other (for example due to an exchange holiday), or the same holiday applies to both securities (e.g. Labor Day for IBM US and SPX) the following adjustments are made:

1. The date is ignored if both securities do not have a data point.
2. If “Percent Diff” or “Diff” is selected as regression in HRA (in BETA it is always “Percent Diff” by default) we adjust the value of the next available point by dividing it with square root of the number of missing points + 1. So if 1 data point is missing it is divided by $\sqrt{2}$ or if 2 data points are missing then it is divided by $\sqrt{3}$ and so on. This is done for both securities, including the one that had a data point for the date that was dropped.

For example, the table below contains data for 3 days for a security A. The adjustment done when percent diff is used to calculate BETA is shown below. Note that it does not matter if the second security had data on 10/23/2008 and 10/24/2008 – the same adjustments will be made to it as well.



Date	Close Price	% Diff
10/22/2008	14.51	
10/23/2008	(missing / no data)	(no data)
10/24/2008	(missing / no data)	(no data)
10/25/2008	14.76	$= (14.76 / 14.51 - 1) * 100 / \text{SQRT}(3)$

See the sheet BETA in the Excel spreadsheet Beta_CORR_Worksheet.xls. {IDOC # 2055466}.

1.4 Origin of the Adjusted BETA Formula

The formula for adjusted beta is based on Blume's equation (Betas and their regression tendencies, 1975). The adjusted beta formula assumes that beta moves towards the market mean, which is 1.





2 CORR

2.1 Calculations

X = independent variable (price values for security 2 – could be adjusted)

Y = dependent variable (price values for security 1 – could be adjusted)

$$\text{Covariance} = \frac{\sum xy}{n}$$

$$\text{BETA} = \frac{\sum xy}{(n-1) * \sqrt{\frac{\sum x^2}{n-1}} * \sqrt{\frac{\sum y^2}{n-1}}}$$

$$\text{ALPHA} = Y' - \text{BETA} X'$$

$$R^2 = \left(\frac{\text{Covariance} * n}{(n-1) * \sqrt{\frac{\sum y^2}{n-1}} * \sqrt{\frac{\sum x^2}{n-1}}} \right)^2$$

$$\text{Residuals} = \sum y^2 * (1 - R^2)$$

Number of Points = Number of data points for the calculation
 (For percent diff/diff, number of points= n-1,
 where n is number of days.)

2.2 Adjustment of Missing Points for CORR

See section 1.3 Adjustment of Missing Points for BETA and HRA in this document. The same adjustments are applied in CORR.



2.3 CORR Order of Operations

CORR allows the user to apply various transformations on the price data for securities. This can be done per security from the Edit screen. The order in which these transformations are applied can greatly affect the calculated results. The correct order in which the transformations should be applied is:

- a) Obtain Price of the security with Lag (if applicable).
- b) Apply Simple moving Average (if applicable).
- c) Apply Log (if applicable).
- d) Apply percentage difference/difference (if applicable).
- e) Data adjustment for missing values (see section 2.2).

Please note that any attempt to manually match the data in an Excel spreadsheet with the CORR results should take this operation order into account. Otherwise, the results will not match CORR results.

See the sheet CORR in the Excel spreadsheet Beta_CORR_Worksheet.xls {IDOC # 2055466}.

2.4 Differences between CORR and HS

While the basic correlation calculation is the same for both CORR and HS with identical settings, there are a few differences:

a) Period of Correlation

HS uses a rolling correlation period to plot the correlation curve, while CORR calculates a single correlation value using all the data from the given date range. In the case of HS, the period of correlation can be changed on the Edit Page. The default value for this is normally 120. Each correlation value on the chart is calculated using the number of previous data points as specified by this period.



In CORR, however, the period depends on the date ranges and the numeric value of the period used can be seen by clicking on the specific value in the correlation matrix. If this “period” in CORR does not match the correlation value in HS, the final results will be quite different.

b) Overrides

CORR offers more overrides and adjustment options than HS for calculation the correlation value as listed in section 2.3 of this document. HS only offers the choice between correlating the raw values or the percent differences. Make sure no other overrides and adjustments are used in CORR when comparing the result between CORR and HS.

c) Adjustment for Missing Data Points

In HS if a data point is missing for a security, the value from the previous day is carried forward. The correlation is calculated based on these carried forward values. In CORR the adjustment is made as explained in section 1.3 of this document. This will often lead to slight differences in the result assuming all other properties match.



3 Importing Data to Microsoft Excel

The first step toward comparing the calculations in an Excel spreadsheet and the calculations in BETA, HRA or CORR is to verify that the data used in the functions match the data in the spreadsheet. The best way to confirm that is to populate the spreadsheet using the Excel API by following these steps:

- a) Click on “Import Data” on the Bloomberg Tab in Excel.
- b) Choose “Historical End of Day” as data type.
- c) Add the securities.
- d) Choose the appropriate price field.
- e) Choose the date range for which data is required.
- f) Choose “Include all non-trading weekdays” option.
- g) Choose “Blank” as the value for the option “Filler value non trading periods.”
- h) Choose “Yes” as the value for the option “Follow DPDF Settings.”

4 Comparing BETA with FLDS and Excel

Calculations in BETA/CORR/HRA are often compared with calculations in FLDS or through the API in Microsoft Excel. The calculations should match in most cases. However they may differ due to difference in following settings:

- a) GFUT settings: If one of the securities is a Future, Excel/FLDS may ignore the GFUT settings and use the “Bloomberg default” value for the Price option. BETA/HRA/CORR take GFUT settings into consideration and the underlying price data therefore may be different, leading to different results.
- b) IDEF settings: If one of the securities is an Index, Excel/FLDS may ignore the IDEF settings and use the “Close/Sett(4)” property for the Value option. BETA/HRA/CORR take IDEF settings into consideration and the underlying price data therefore may be different, leading to different results.



HOW TO INVEST IN COMMON STOCKS



The Guide to Using
**THE VALUE LINE
INVESTMENT SURVEY®**

HOW TO INVEST IN COMMON STOCKS

The Complete Guide to Using

THE VALUE LINE INVESTMENT SURVEY



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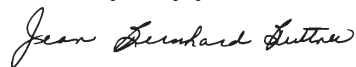
**A Statement from Jean B. Buttner,
Chairman and CEO
of Value Line Publishing, Inc.**

Investors need to have unbiased and independent research! That is something Value Line subscribers have known for over 70 years. Value Line has no investment banking business with any company, including the approximately 1,700 companies our analysts follow. Unlike typical Wall Street brokerage firms, Value Line does not execute trades for its subscribers and therefore has no vested interest in whether its subscribers buy, sell or hold. Our staff of professional securities analysts may not own shares of a company that they are assigned to cover. Our subscribers receive only the highest quality of unbiased and independent research.

We utilize a time-proven disciplined system that ranks a company's relative performance over the next 12 months from 1, Highest, to 5, Lowest. Our record of performance speaks for itself: From April 16, 1965 through June 30, 2004, the Value Line stocks ranked No. 1 for Timeliness outperformed the Dow Jones Industrial Average and the Standard & Poor's 500 Indexes by more than 38 to 1.

If you are looking for unbiased, independent, and objective investment research and ideas, look no further than Value Line – we answer only to you.

Very truly yours,



Jean B. Buttner,
Chairman & CEO

CHAPTER

1

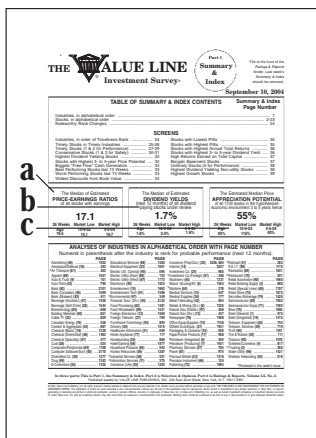
GETTING STARTED

**How to use
*The Value Line Investment Survey***

The Value Line Investment Survey is a unique source of financial information designed to help investors make informed investment decisions that fit their individual goals and levels of risk. It is: (1) a proven forecaster of stock price performance over the next six to 12 months; (2) a source of interpretative analysis of approximately 1,700 individual stocks and more than 90 industries; and (3) a source of historical information that helps investors spot trends.

If you come across any unfamiliar terms as you read through this guide, please refer to the *Glossary* which begins on page 30.

right of the industry name and the page number of the industry analysis in *Ratings & Reports* listed under PAGE. The market statistics are found in three boxes. The first box (a) has the median of estimated price/earnings ratios of all stocks with earnings in *The Value Line Investment Survey*. The second box (b) shows the median of estimated dividend yields (total dividends expected to be paid in the next 12 months divided by the recent price) of all dividend-paying stocks in *The Survey*. The third box (c) contains the estimated median price appreciation potential 3 to 5 years into the future for the approximately 1,700 stocks in *The Survey*. By studying these statistics, a fairly good picture emerges of how the universe of Value Line stocks is currently being evaluated. *The Value Line universe of approximately 1,700 stocks has a market value of more than \$14 trillion, and is quite representative of the whole stock market.*



Summary & Index

**Part 1 -
 Summary &
 Index**

Please start with the *Summary & Index*. The front cover contains a Table of Contents, three important market statistics, and a list of all the industries we follow in alphabetical order with the relative industry rank to the

Beginning on page 2, the *Summary & Index* also includes an alphabetical listing of all stocks in the publication with references to their location in Part 3, *Ratings & Reports*. If you are looking for a particular stock, look inside the *Summary & Index* section, which is updated each week to provide the most current data on all companies included in *The Value Line Investment Survey*.

To locate a report on an individual company, look for the page number just to the left of the company name. Then turn to that page in Part 3, *Ratings & Reports*, where the number appears in the upper right corner.

In the far left column of *Summary & Index* is a number that refers to recent Supplementary Reports, if any, which are included on the back pages of *Ratings & Reports*. If two asterisks (**) appear in this column, it means that there is a Supplementary Report in the current Issue.

There are many columns in the *Summary & Index* with more information on each of the approximately 1,700 stocks we cover, including from left to right:

- page numbers for the latest company report and any recent Supplementary Report (Supplementary Reports are published at the back of *Ratings & Reports*)
- the name of each stock and the exchange on which it is traded (the New York Stock Exchange, unless otherwise indicated).
- each company's stock exchange (ticker) symbol
- the recent stock price (see the top of page 2 in *Summary & Index* under *Index to Stocks* for the specific date)
- Value Line's proprietary *Timeliness*TM, *Safety*TM and *Technical*TM ranks (See Chapter 3 and the Glossary for definitions)
- Beta (a measure of volatility)
- each stock's 3- to 5-year Target Price Range and the % appreciation potential
- each stock's current P/E ratio
- each stock's % estimated dividend yield
- each stock's estimated earnings (approximately 6 months historical, 6 months estimated)
- each stock's estimated dividends for the next 12 months
- each stock's Value Line *Industry*TM rank (see Chapter 6)
- latest earnings and dividend declarations
- options trade indicator

There is also a wealth of information in the form of stock screens toward the back of the *Summary & Index*. The stock screens are a good place to start for anyone looking for investment ideas or help in forming a strategy. They are also useful for investors who want a list of stocks relevant to specific strategies they may have in mind.

Some examples of our useful screens are:

- Industries in Order of *Timeliness*
- Stocks Moving Up or Down in *Timeliness* Rank
- Timely Stocks in Timely Industries
- Conservative Stocks
- Highest Dividend Yielding Stocks
- Stocks with the Highest Estimated 3- To 5-Year Price Appreciation Potential
- Best/Worst Performing Stocks in the Past 13 Weeks
- Stocks With the Lowest and Highest P/E Ratios
- Stocks with the Highest Estimated Annual Total Returns (Next 3 To 5 Years)
- Stocks with the Highest Projected 3- To 5-year Dividend Yield
- Highest Growth Stocks (Definition Under The Title)

Part 2 - Selection & Opinion

Selection & Opinion (S&O) contains Value Line's latest economic and stock market commentary and advice, along with one or more pages of research on interesting stocks or industries, and a variety of pertinent economic and stock market statistics. It also includes three model stock portfolios



Selection & Opinion

(Stocks with Above-Average Year-Ahead Price Potential, Stocks for Income and Potential Price Appreciation, and Stocks with Long-Term Price Growth Potential). For more information on the portfolios, see page 26 in this Guide. If you spend time with *Selection & Opinion* each week, you should be able to get some valuable investment ideas.

Part 3 - Ratings & Reports

Ratings & Reports is the core of *The Value Line Investment Survey* with one-page reports on approximately 1,700 companies and one- or two-page reports on more than 90 industries. The company reports contain *Timeliness*, *Safety* and *Technical* ranks, our 3- to 5-year forecasts for stock prices, income and balance sheet data, as much as 17 years of historical data, and our analysts' commentaries. They also contain stock price charts; quarterly sales, earnings, and dividend information; and a variety of other very useful material. Each page in this section is updated every 13 weeks. When unexpected important news occurs during these 13 week intervals, a Supplementary Report (appearing in the back section of

Ratings & Reports) is published. If there is a Supplementary Report, its page number will be shown in the far left hand column of the *Summary & Index*, near the company name.

Two asterisks — ** — indicate that a Supplementary Report is in this week's Edition.

Every week subscribers receive a new Issue of *Ratings & Reports* containing approximately 135 company reports grouped by industry and a smaller number of one- or two-page industry reports. The industry reports precede the reports on the companies in that industry. Over the course of three months, new reports are issued on all of the approximately 1,700 companies and more than 90 industries.

The image shows the cover of 'THE VALUE LINE Investment Survey' for 'ISSUE 2' on 'Page 135-136', dated 'September 18, 2004'. The cover is densely packed with text, organized into columns and rows. At the top left, it says 'THE VALUE LINE Investment Survey' with the website 'www.valueline.com'. At the top right, it says 'ISSUE 2 Page 135-136' and 'September 18, 2004'. The main body of the cover is a grid of industry names and page numbers. A 'SPECIALLY NOTICED' section is highlighted on the right side. At the bottom, there is a small disclaimer and a note about the 'SPECIALLY NOTICED' section.

Ratings & Reports

CHAPTER

2

PLANNING AN
INVESTMENT STRATEGY

Diversification

Most investors believe in owning a diversified portfolio of stocks, a strategy that Value Line strongly recommends. A diversified portfolio usually fluctuates less in its entirety than does an individual stock because the price variations of individual stocks tend to cancel each other out, with some moving up while others move down. It is also important to diversify not only among stocks, but also across industries.

For most individual investors, a practical rule for diversifying is to hold a total of at least ten stocks in approximately equal dollar amounts in at least ten or more different industries.

Creating a Diversified Portfolio

A good way to start is to turn to the screen called *Timely Stocks In Timely Industries*, usually found on page 25 of the *Summary & Index*.

This screen not only lists the industries that Value Line currently ranks highest (based on our *Timeliness Ranking System*, discussed in Chapter 3), but also the stocks that have the highest *Timeliness* ranks in those timely industries.

Select ten or more industries you think might be attractive from among those with the highest industry ranks. At this point, you may want to read the pages on specific industries to help you make a decision. The industry reports precede the reports on the companies in their industry. Then select one or two of the stocks ranked highest for *Timeliness* within each industry. The pages in *Ratings & Reports* examine these stocks in great detail.

Many of the stock screens in the back pages of the *Summary & Index* can be useful in creating a diversified portfolio. For instance, if you are interested in stocks of companies with growing sales, cash flow, earnings, dividends, and book value, study the Highest Growth Stocks screen. To be included in this list, a company's annual growth of sales, cash flow, earnings, dividends and book value must together have averaged 11% or more over the past 10 years and be expected to average at least 11% in the coming 3-5 years. There are many screens of stocks in the back section of the *Summary & Index* which will help you form a diversified portfolio. As mentioned elsewhere in this guide, *Selection & Opinion* also contains model portfolios which can be used to obtain ideas for any investor's portfolio.

CHAPTER

3

VALUE LINE'S
RANKING SYSTEMS

The Value Line Investment Survey has a number of unique features that distinguish it from other advisory services and make it easier for you to have accurate, timely information so that you may keep up to date on all developments affecting your investments.

Probably the most famous are Value Line's time-honored ranking systems for *Timeliness* and *Safety*, which rank approximately 1,700 stocks relative to each other for price performance during the next six to 12 months. The newer Value Line *Technical Ranking System* is designed to predict short-term stock price movements. In each case, stocks are ranked from 1 to 5, with 1 being the highest ranking.

Note: Any one Value Line stock rank is always relative to the ranks of all other stocks in the Value Line universe of approximately 1,700 stocks.

Timeliness

The *Value Line Timeliness* rank measures relative probable price performance of all of the approximately 1,700 stocks during the next six to 12 months on an easy-to-understand scale from 1 (Highest) to 5 (Lowest). The components of the *Timeliness Ranking System* are the 10-year trend of relative earnings and prices, recent earnings and price changes, and earnings surprises. All data are actual and known. A computer program combines these elements into a forecast of the price change of each stock, relative to all other approximately 1,700 stocks for the six to 12 months ahead.

Rank 1 (Highest): These stocks, as a group, are expected to be the best performers relative to the Value Line universe during the next six to 12 months (100 stocks).

Rank 2 (Above Average): These stocks, as a group, are expected to have better-than-average relative price performance (300 stocks).

Rank 3 (Average): These stocks, as a group, are expected to have relative price performance in line with the Value Line universe (approximately 900 stocks).

Rank 4 (Below Average): These stocks, as a group, are expected to have below-average relative price performance (300 stocks).

Rank 5 (Lowest): These stocks, as a group, are expected to have the poorest relative price performance (100 stocks).

Changes in the *Timeliness* ranks can be caused by:

1. New earnings reports
2. Changes in the price movement of one stock relative to the approximately 1,700 other stocks in the publication
3. Shifts in the relative positions of other stocks

TIMELINESS	2	Raised 5/28/04
SAFETY	1	New 7/27/90
TECHNICAL	3	Lowered 8/6/04
BETA	.65	(1.00 = Market)

Ranks Box
(Also see item 1, on page 21)

Value Line's Timeliness Rank Record

The *Value Line Timeliness Ranking System* has been operating essentially in its present form since 1965. Its exemplary record has attracted the attention of academicians and has been the subject of numerous articles in scientific and financial journals.

Our performance record is discussed here and shown in the graphs on pages 9 and 10. The first shows that through December 2004 our 1-ranked stocks appreciated 49,441% (before commission costs and before dividends) since 1965. That compares with a gain of 1,082% for the Dow Jones Industrial Average. That is, if you consistently owned the one hundred stocks ranked number one out of the total of approximately 1,700, the portfolio, as a whole, would have appreciated more than 49,000%. The second graph shows that if you bought all our 1-ranked stocks at the beginning of January of each year, held them until the end of December, and then set up a new portfolio of 1-ranked stocks at the beginning of each subsequent year, the portfolio would have risen 19,715% since 1965. These are records we believe nobody else has ever matched.

Making Changes Weekly

Value Line has been calculating changes in the *Timeliness Ranking System* on a weekly basis for more than 37 years and has been publishing the results of those changes in *Selection & Opinion*. The record of weekly performance is outstanding and is shown in the chart and table on page 9. There you can see just how stocks ranked 1, 2, 3, 4, and 5 have done, assuming that all rank changes were implemented each week.

What you can clearly see is that there have been spectacular results not only for stocks in Groups 1 and 2,

but also, in reverse, for those in Groups 4 and 5. You can see that our evaluations for *Timeliness* are equally effective in showing both good stocks to seek and poor ones to avoid.

Stocks ranked 1 and 2 for *Timeliness* cannot be expected to outperform the market in every single week or month. But over a longer period, the expectation that they will do so as a group is warranted, as our actual results demonstrate.

Making Annual (Once a Year) Changes

Most investors do not buy and sell stocks every week. Frequent "trading" may result in large commission costs. For these reasons, we have also regularly published a record of the results of annual changes in the *Timeliness Ranking System*. In what we call the "Frozen Record," we assume that investors buy stocks on the first business day of each year and hold them until the last day of the same year. Here, too, the top groups have consistently surpassed the growth of the other groups, as can be seen on page 10.

Safety

A second investment criterion is the *Safety* rank assigned by Value Line to each of the approximately 1,700 stocks. The *Value Line Safety* rank measures the total risk of a stock relative to the approximately 1,700 other stocks. It is derived from a stock's Price Stability rank and from the Financial Strength rating of a company, both shown in the lower right hand corner of each page in *Ratings & Reports*. Safety ranks are also given on a scale from 1 (safest) to 5 (riskiest) as follows:

Rank 1 (Highest): These stocks, as a group, are the safest, most stable, and least risky investments relative to the Value Line universe, which accounts for about 95% of the market volume of all stocks in the U.S.

Rank 2 (Above Average): These stocks, as a group, are safer and less risky than most.

Rank 3 (Average): These stocks, as a group, are of average risk and safety.

Rank 4 (Below Average): These stocks, as a group, are riskier and less safe than most.

Rank 5 (Lowest): These stocks, as a group, are the riskiest and least safe.

Stocks with high *Safety* ranks are often associated with large, financially sound companies; these same companies also often have somewhat less than average growth prospects because their primary markets tend to be growing slowly or not at all. Stocks with low *Safety* ranks are often associated with companies which are smaller and/or have weaker than average finances; on the other hand, these smaller companies sometimes have above-average growth prospects because they start with a lower revenue and earnings base.

Value Line's Safety Rank Record

Safety becomes particularly important in periods of stock market downswings, when many investors want to try to limit their losses. As with *Timeliness*, the record of *Safety* over the years is impressive. When you study the data (shown in the table below), you will find that stocks with high *Safety* ranks generally fall less than the market as a whole when stock prices drop. The table shows how *Safety* ranks worked out in all major market declines between 1966 and the present.

The lesson is clear. If you think the market is headed lower, but prefer to maintain a fully invested position in stocks, concentrate on stocks ranked 1 or 2 for *Safety*. Also, at the same time, try to keep your portfolio ranked as high as possible for *Timeliness*. You may not be able to find stocks ranked high on both counts. You then must decide which is more important—price performance over the next six to 12 months, or *Safety*. A compromise of picking stocks ranked 1 or 2 for *Timeliness* and 1 or 2 for *Safety* may be necessary.

The Penalty and Reward of Risk

A risky stock is one which has low price stability and whose price fluctuates widely around its own long-term trend. It may also be a stock of a company with a low Financial Strength rating. One may reasonably assume that the price of a risky stock will go up more than that of a safe stock in a generally strong market. Yet, if in the interim it went down more sharply and you had to sell at an inopportune time, you could suffer a heavier penalty for having bought the high-risk stock instead of the safer one.

High Value Line *Timeliness* ranks give some protection against a general market decline, but only over a period of six to 12 months. They cannot be relied upon to help protect against a sharp drop in the stock market in every week or month, as a high *Safety* rank may often do.

Technical

The Value Line *Technical* rank uses a proprietary formula to predict short-term (three to six month) future price returns relative to the Value Line universe. It is the result of an analysis which relates 10 price trends of different duration for a stock during the past year to the relative price changes of the same stock expected over the succeeding three to six months. The *Technical* rank is best used as a secondary investment criterion. We do not recommend that it replace the *Timeliness* rank. As with the other ranks, the *Technical* rank goes from 1 (Highest) to 5 (Lowest.)

RESULTS OF SAFETY RANKS IN MAJOR MARKET DECLINES									
Safety Rank	2/11/66– 10/7/66–	12/13/68– 7/2/70–	4/14/72– 9/11/74–	6/17/81– 8/11/82–	8/26/87– 12/4/87–	7/13/90– 11/2/90–	4/22/98– 10/08/98–	5/22/01– 9/21/01	4/16/02– 10/9/02
Group 1	-15.6%	-28.6%	-40.5%	-10.5%	-24.7%	-19.0%	-6.1%	-11.5%	-20.8%
Group 2	-18.2	-29.6	-39.9	-16.2	-28.7	-15.5	-14.0	-14.0	-23.8
Group 3	-24.0	-41.1	-47.2	-25.2	-36.0	-24.9	-29.7	-23.4	-33.1
Group 4	-26.5	-57.0	-53.3	-33.6	-40.7	-33.2	-41.7	-41.7	-55.2
Group 5	-29.2	-64.8	-70.0	-31.4	-46.9	-33.1	-37.8	-34.3	-51.7

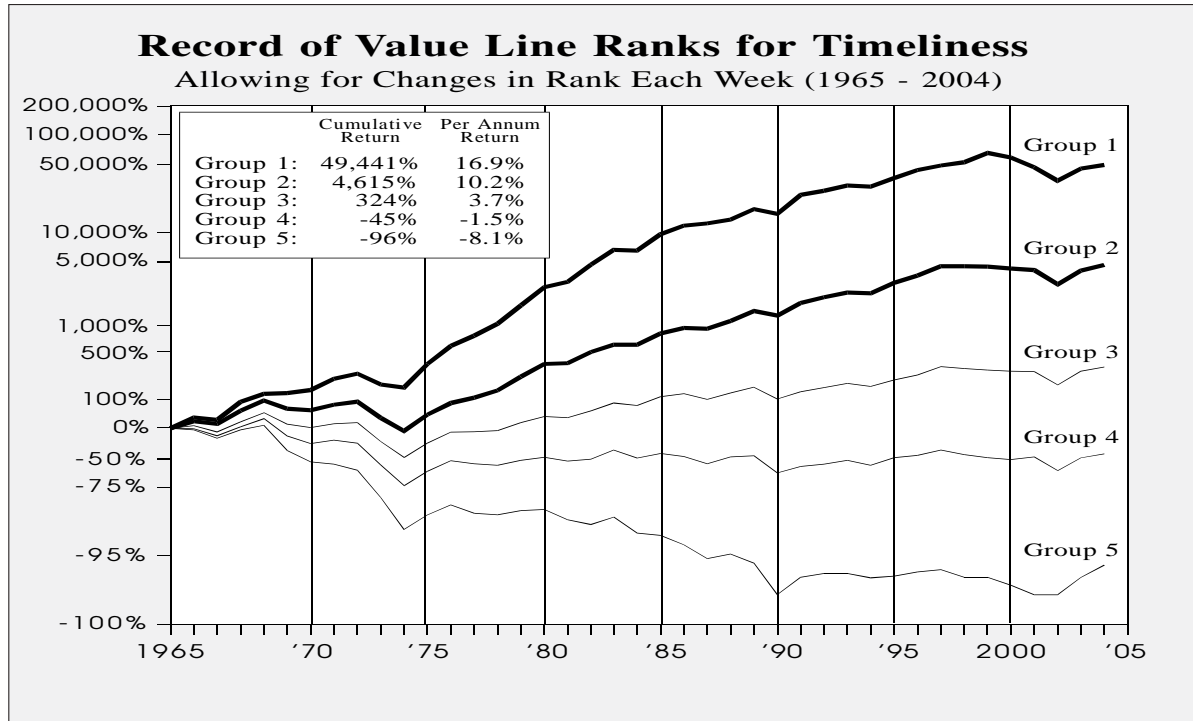
The results of the *Technical* ranks since the beginning of 1984, are shown below. From that data, we can calculate that from December 31, 1983, through December 2002, the stocks with a *Technical* ranks of 1 rose 1105%. Those ranked 5 rose just 17%. By way of comparison, the Standard & Poor's 500 Stock Index, a recognized measure of broad stock market performance, was up 433% in the same period.

Industry

Value Line also publishes *Industry* ranks which show the *Timeliness* of each industry. These ranks are updated weekly and published on the front and inside pages of the *Summary & Index*. They also appear at the top of each Industry Report. The *Industry* Rank is calculated by averaging the *Timeliness* ranks of each of the stocks which have been assigned a *Timeliness* rank in a particular industry. For more information, see page 22.

RECORD OF TECHNICAL RANKS (QUARTERLY REBALANCING)					
	1	2	3	4	5
1984	-14.9%	-8.8%	-6.0%	-5.5%	0.0%
1985	42.5	32.3	28.1	19.7	4.5
1986	36.6	25.0	18.4	4.5	-11.7
1987	-7.7	-6.2	-6.7	-5.8	-18.2
1988	11.2	13.3	16.0	22.2	10.1
1989	27.6	25.0	19.9	9.0	-15.6
1990	-15.2	-11.2	-14.6	-28.5	-45.6
1991	61.9	32.1	31.7	44.5	43.5
1992	19.7	12.1	11.4	9.9	12.4
1993	41.5	21.7	12.3	14.7	19.2
1994	-1.4	-3.1	-2.3	-3.4	-7.6
1995	31.1	27.2	24.6	16.7	11.0
1996	21.5	22.6	16.6	15.0	19.3
1997	40.4	31.6	24.9	22.5	8.7
1998	26.5	16.9	2.5	-6.9	-8.8
1999	70.0	17.6	1.1	-0.5	8.7
2000	-7.0	10.1	12.9	12.2	-7.3
2001	-5.3	7.6	9.8	22.9	34.6
2002	-42.9	-25.8	-14.2	-8.3	-3.4
2003	57.2	39.2	38.4	55.3	122.9
2004	21.8	15.3	15.6	16.4	19.5
TOTAL	2207	1133	712	550	211
S&P:	635				

BUYING AND SELLING STOCKS EACH WEEK



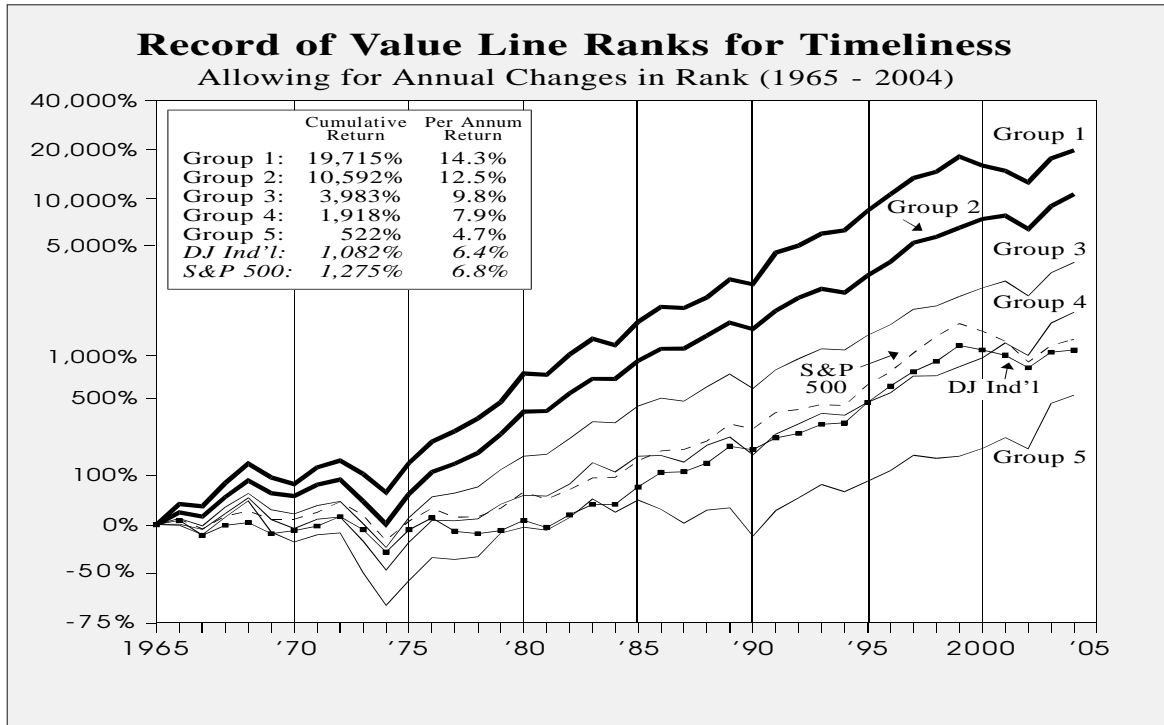
RECORD OF VALUE LINE RANKINGS FOR TIMELINESS (ALLOWING FOR CHANGES IN RANK EACH WEEK)[†]
April 16, 1965 to December 31, 2004

Group	'65*	'66	'67	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85
1	28.8%	-5.5%	53.4%	37.1%	-10.4%	7.3%	30.6%	12.6%	-19.1%	-11.1%	75.6%	54.0%	26.6%	32.6%	54.7%	52.6%	13.6%	50.6%	40.9%	-2.1%	47.0%
2	18.5	-6.2	36.1	26.9	-17.5	-3.2	13.7	7.4	-28.9	-29.5	47.4	31.2	13.4	18.3	38.0	35.7	1.8	31.0	19.1	-0.8	30.7
3	6.7	-13.9	27.1	24.0	-23.8	-8.0	9.3	3.5	-33.6	-34.1	40.7	29.0	1.3	3.0	20.7	15.4	-3.3	17.9	20.2	-5.6	22.8
4	-0.4	-15.7	23.8	20.9	-33.3	-16.3	8.4	-7.1	-37.9	-40.6	39.3	28.8	-6.9	-3.8	12.8	7.4	-8.7	5.1	25.0	-17.4	11.4
5	-3.2	-18.2	21.5	11.8	-44.9	-23.3	-5.5	-13.4	-43.8	-55.7	40.9	26.7	-17.6	-3.2	10.4	2.9	-21.4	-10.9	19.0	-31.0	-5.6

Group	'86	'87	'88	'89	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'65* to 2004
1	22.9%	5.4%	9.5%	27.9%	-10.4%	55.4%	10.0%	13.4%	-2.6%	22.8%	20.4%	11.3%	8.2%	24.1%	-10.4%	-20.3%	-27.2%	33.8%	8.4%	49,441%
2	14.4	-2.4	20.4	26.5	-10.2	34.1	14.3	12.4	-2.2	28.1	19.0	24.0	0.1	-0.5	-4.4	-3.8	-28.8	38.2	14.5	4,615
3	7.7	-12.6	16.1	13.7	-24.4	18.9	11.0	9.8	-6.9	16.6	12.3	21.5	-3.9	-3.3	-3.2	-0.8	-27.1	38.2	10.5	324
4	-6.8	-15.8	17.6	2.6	-33.7	16.7	6.2	8.5	-9.9	17.1	7.1	14.5	-11.0	-7.5	-3.7	5.9	-26.7	34.2	9.4	-45
5	-19.6	-28.0	11.4	-19.2	-45.5	25.5	15.4	0.3	-15.2	5.2	7.5	16.6	-11.5	-1.3	-19.7	-7.2	-15.7	52.2	15.2	-96

* April through December
 † Geometric Averaging

BUYING STOCKS AT THE BEGINNING OF EACH YEAR



RECORD OF VALUE LINE RANKINGS FOR TIMELINESS (WITHOUT ALLOWING FOR CHANGES IN RANK EACH WEEK) [†]																					
April 16, 1965 to December 31, 2004																					
Group	'65*	'66	'67	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85
1	33.6%	-3.1%	39.2%	31.2%	-17.7%	-8.9%	26.5%	10.1%	-17.1%	-23.1%	51.6%	35.3%	15.8%	19.8%	25.6%	50.2%	-1.9%	33.7%	25.2%	-8.6%	38.6%
2	18.9	-6.0	31.9	26.3	-16.3	-4.0	17.4	7.5	-26.2	-27.8	53.0	36.3	12.7	16.1	30.8	37.4	0.7	29.0	22.2	-0.1	29.5
3	8.9	-9.7	30.1	21.4	-20.7	-5.5	12.2	6.2	-27.0	-28.5	52.9	33.8	5.2	9.2	27.6	20.8	2.7	25.5	26.7	-1.6	26.6
4	0.8	-7.2	25.1	25.1	-26.8	-11.7	14.2	3.2	-29.1	-33.6	48.4	36.1	-0.2	2.4	23.1	13.2	-0.9	18.1	35.2	-12.3	24.6
5	-1.2	-12.4	28.4	25.9	-35.7	-13.1	10.5	2.9	-43.1	-36.8	42.1	38.2	-2.8	4.0	39.9	8.4	-4.2	19.9	30.0	-17.1	18.7
Avg.	10.1	-7.9	29.9	24.6	-22.1	-7.5	14.9	5.5	-27.7	-29.6	51.2	35.1	5.8	9.6	28.0	23.4	0.9	25.0	27.5	-4.7	27.0
Group	'86	'87	'88	'89	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'65* to 2004	
1	23.5%	-1.2%	16.0%	28.7%	-6.6%	56.7%	10.1%	18.5%	4.6%	31.3%	27.0%	25.8%	9.3%	23.7%	-11.7%	-7.4%	-15.0%	40.1%	12.2%	19,715%	
2	18.7	0.4	19.7	20.3	-8.7	29.8	19.9	13.6	-5.3	27.1	21.4	31.3	8.5	13.9	13.2	4.8	-17.3	37.9	18.8	10,592	
3	11.5	-4.1	23.2	19.6	-18.6	30.0	17.5	15.3	-1.6	22.8	16.1	24.1	4.8	14.5	13.0	10.2	-18.8	38.6	15.8	3,983	
4	1.5	-9.1	27.2	12.4	-22.8	34.1	15.6	16.5	-2.9	20.2	14.3	26.6	0.6	13.5	14.0	23.3	-16.2	58.2	16.5	1,918	
5	-12.1	-17.9	20.0	3.3	-33.0	43.8	19.9	20.3	-9.3	15.7	15.8	24.4	-4.0	2.8	11.6	16.4	-14.5	90.1	12.3	522	
Avg.	10.2	-4.9	22.6	17.8	-17.6	33.4	17.3	15.7	-2.6	23.2	17.4	26.1	4.4	14.0	11.4	11.0	-17.5	45.4	16.0	4,264	
																	Dow Jones Industrials	1,082%			
																	S&P 500	1,275%			

* April through December
 † Arithmetic Averaging

CHAPTER

4

UNDERSTANDING
THE VALUE LINE PAGE

To start studying a stock, we suggest that you concentrate on four features found on every *Ratings & Reports* page (see sample on page 21 of this guide). First, we recommend that you look at the *Timeliness*, *Safety*, and *Technical* ranks (see item 1) shown in the upper left corner of each page. Then, read the Analyst's Commentary (item 17) in the bottom half of each report. Next, we suggest you look at our forecasts for various financial data including the stock price (items 11, 15, 22, 23, and 29). These forecasts are explained in more detail later in this Chapter. Finally, we think you should study the historical financial data appearing in the Statistical Array in the center of the report (item 26). Illustrations and more detail follow. There is also a lot of other useful information on each page, but the four features mentioned above provide the best place to begin.

Value Line Ranks

(See 1 in the example on page 21)

A synopsis of the *Value Line Ranking System* follows. For a more detailed description, please refer to Chapter 3.

Timeliness

The *Timeliness* rank is Value Line's measure of the expected price performance of a stock for the coming six to 12 months relative to our approximately 1,700 stock universe. Stocks ranked 1 (Highest) and 2 (Above Average) are likely to perform best relative to the others. Stocks ranked 3 are likely to be average performers relative to the

TIMELINESS	2	Raised 5/28/04
SAFETY	1	New 7/27/90
TECHNICAL	3	Lowered 8/6/04
BETA	.65	(1.00 = Market)

Ranks Box
(Also see item 1, on page 21)

Value Line universe. Stocks ranked 4 (Below Average) and 5 (Lowest) are likely to underperform stocks ranked 1 through 3 in Value Line's stock universe.

Just one word of caution. Stocks ranked 1 are often volatile and tend to have smaller market capitalizations (the total value of a company's outstanding shares, calculated by multiplying the number of shares outstanding by the stock's market price per share). Conservative investors may want to select stocks that also have high *Safety* ranks because they are usually more stable issues.

Safety

The *Safety* rank is a measure of the total risk of a stock compared to others in our approximately 1,700 stock universe. As with *Timeliness*, Value Line ranks each stock from 1 (Highest) to 5 (Lowest). However, unlike *Timeliness*, the number of stocks in each category from 1 to 5 is not fixed. The *Safety* rank is derived from two measurements (weighted equally) found in the lower right hand corner of each page:

a company's Financial Strength and a Stock's Price Stability. Financial Strength is a measure of the company's financial condition, and is reported on a scale of A++ (Highest) to C (Lowest). The largest companies with the strongest balance sheets get the highest scores. A Stock's Price Stability score is based on a ranking of the standard deviation (a measure of volatility) of weekly percent changes in the price of a stock over the last five years, and is reported on a scale of 100 (Highest) to 5 (Lowest) in increments of 5.

Technical

The *Technical* rank is primarily a predictor of short term (three to six months) relative price change. It is based on a proprietary model which examines 10 short-term price trends for a particular stock over different periods in the past year. The *Technical* ranks also range from 1 (Highest) to 5 (Lowest). At any one time, approximately 100 stocks are ranked 1; 300 ranked 2; 900 ranked 3; 300 ranked 4; and 100 ranked 5.

Beta

This is a measure of volatility, as calculated by Value Line. While it is not a rank, we do consider it important. See the *Glossary* for more detail.

Analyst's Commentary

(17 in the example on page 21)

Next, look at the analyst's written commentary in the lower half of the page. Many readers think this is the most important section of the page. In the commentary, the analyst discusses his/her expectations for the future. There are times when the raw numbers don't tell the full story.

Johnson & Johnson topped expectations in 2004's initial half, and we raised our earnings estimate for the year. In the March quarter, the company beat our \$0.82 bottom-line estimate by \$0.03 in the second period, posting a 17% year-over-year increase. Revenues were up 11.3% in the most recent quarter, 8.5% on a constant currency basis. Significantly, too, sales growth was solid across all three major businesses, with pharmaceuticals, medical devices & diagnostics, and consumer expanding by 11.1% (to \$5.4 billion), 11.8% (\$4.1 billion), and 10.0% (\$2.0 billion), respectively. An enriched sales mix, meantime, along with cost-cutting initiatives, added 1.2 percentage points to the gross margin. In view of both the out-performance and the receding prospect of generic rivals for *Duragesic*, we've upped (by \$0.06) our estimate for 2004 to \$3.03, in line with management's guidance. **The bottom-line advance will likely continue to decelerate, though, slowing into single-digit territory in 2005.** Sales of *Procrit*/*Eprex*, J&J's best-seller, are under substantial competitive and pricing pressures, as underscored by a 14% (or \$137 million) drop in the June quarter. Top-line contributions from another key growth driver, *Cypher* (drug eluting stent), is also being squeezed mightily by Boston Scientific's *Taxus*, which was launched in March. And, early next year, *Duragesic*, which we estimate will add about \$2 billion to 2004 sales, will undoubtedly face stiff competition from generics. J&J has a decent new-drug pipeline, but we think the share-net advance will be about 9% in 2005, compared with 12% this year and 21% in 2003. **These top-quality shares still deserve consideration.** The healthcare products giant has almost \$11 billion in cash. As well, it generates some \$6 billion annually in free cash flow. Thus, management has ample financial flexibility with which to retransfigure the company's growth profile. Major acquisitions and/or stock repurchases are clearly viable options. J&J stock is timely for the year ahead. Moreover, it also offers good risk-adjusted, 3- to 5-year total return potential. *George Rho* September 3, 2004

Analyst's Commentary
 (Also see item 17, on page 21)

The analyst uses the commentary to explain why the forecast is what it is. The commentary is also particularly useful when a change in trend is occurring or about to occur. As an example, a stock may have a poor *Timeliness* rank but the analyst thinks earnings could turn around in the future. In this case, the analyst may use the commentary to explain why he/she thinks conditions are likely to get better, thus giving the subscriber insight into what is happening, and why.

Financial and Stock Price Projections

Value Line's security analysts make a variety of financial and stock price projections in most reports we publish. They make *Estimates* for 23 different numbers and ratios going out 3 to 5 years into the future in the Statistical Array (item 15). They also forecast a *Target Price Range* (item 11) for each stock, going out 3 to 5 years. And finally they show the *2007-09 Projections* (item 29) for the price of the stock, along with the expected percentage appreciation (depreciation) and the expected annual total return (including dividends). These projections are discussed below.

Financial Estimates

(15 in the example on page 21)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Value Line P/E, Inc. 07-08	
3.38	3.96	4.22	4.07	5.20	5.50	6.12	7.27	8.11	8.41	8.80	9.88	10.47	10.83	12.23	13.42	15.60	16.70	Sales per sh ^A	21.40	
.51	.56	.65	.73	.85	.91	1.06	1.20	1.46	1.52	1.83	2.03	2.27	2.46	2.85	3.20	3.70	4.10	"Cash Flow" per sh	5.60	
36	41	46	50	62	69	78	83	109	121	134	140	170	191	223	232	330	330	Shareholders per sh ^B	4.00	
12.14	16.18	19.22	22.26	28.32	32.37	43.49	49.55	65.62	70.67	86.74	91.79	107.86	123.93	140.00	156.07	192.14	218.21	Div Yld Divd per sh ^C	1.68	
26	28	31	34	38	41	45	48	52	54	62	65	71	74	78	82	90	93	"Div" Shareholders per sh ^D	1.00	
1.31	1.56	1.84	2.11	1.97	2.17	2.77	3.48	4.07	4.59	5.06	5.83	6.76	7.95	7.65	8.61	10.70	12.85	Book Value per sh ^E	19.85	
2864	2864	2864	2864	2864	2864	2864	2864	2864	2864	2864	2864	2864	2864	2864	2864	2864	2864	2864	Common Stock Qty ^F	2667
14.1	15.1	16.1	17.1	18.1	19.1	20.1	21.1	22.1	23.1	24.1	25.1	26.1	27.1	28.1	29.1	30.1	31.1	Book Value	20.00	
1.98	1.17	1.23	1.31	1.21	0.91	.87	1.24	1.40	1.44	1.46	1.80	1.72	1.58	1.41	1.27	1.10	1.00	Relative P/E Ratio	1.58	
2.45	2.26	2.76	1.76	1.85	2.45	2.45	1.95	1.95	1.45	1.95	1.25	1.45	1.25	1.45	1.65	1.85	1.85	Avg Ann Divd Yld ^G	1.65	
CAPITAL STRUCTURE as of 02/04																				
Total Debt \$1.453 mil.	1574	1842	2100	2357	2741	2910	3304	3628	4182	4610	4800	5000	5000	5000	5000	5000	5000	5000	5000	
LT Debt \$2.261 mil.	22.4%	23.2%	24.8%	25.1%	26.8%	27.2%	27.4%	28.8%	31.2%	30.3%	31.8%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	
LT Debt \$3.261 mil.	19.2%	19.7%	20.8%	20.9%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	
Lesses: Unutilized Annual rentals \$143.0 mil.	2006	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	
P/E Stock Note	12.7%	12.8%	13.4%	14.8%	15.5%	15.3%	17.8%	18.8%	17.2%	18.7%	20.1%	20.1%	20.1%	20.1%	20.1%	20.1%	20.1%	20.1%	20.1%	
Common Stock 2,668,107,268 shs.	20142	20102	20102	20102	20102	20102	20102	20102	20102	20102	20102	20102	20102	20102	20102	20102	20102	20102	20102	
MARKET CAP: \$111 billion (Large Cap)	28.2%	28.8%	28.6%	28.7%	27.1%	26.2%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	
CURRENT POSITION (B/E)	36%	34%	34%	34%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	

Statistical Array
 (Also see items 15 and 26, on page 21)

In the Statistical Array in the center of the report (where most of the numbers are), Value Line provides both historical data and financial projections. All projections are printed in *bold italics*

The estimates of sales, earnings, net profit margins, income tax rates, and so forth are all derived from spread

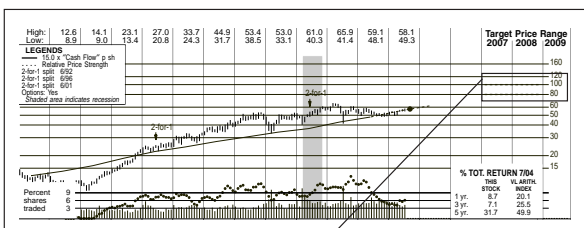
sheets maintained on every company. Our analysts try to review their projections with a company's management whenever they think they should, but at least once a quarter. Afterward, they make whatever adjustments they believe are warranted by unusual developments that may not be revealed in the numbers, i.e., the outcome of pending lawsuits affecting the company's finances, the success of new products, etc.

2007-09 PROJECTIONS			
	Price	Gain	Ann'l Total Return
High	100	(+75%)	16%
Low	80	(+40%)	10%

2006-08 Projections
 (Also see item 29, on page 21)

Target Price Range

In the upper right-hand section of each report is a *Target Price Range*. The *Target Price Range* represents the band in which the expected average price is likely to fall.



Target Price Range (3 to 5 years)
 (Also see item 11, on page 21)

This is the projected annual stock price range for the period out 3 to 5 years. The prices are based on the analyst's projections in the period out 3-5 years for earnings multiplied by the average annual price/earnings ratio in the Statistical Array for the same period. The width of the high-low range depends on the stock's *Safety* rank. (A stock with a high *Safety* rank has a narrower range, one with a low rank, a wider band.)

3- to 5- Year Projections (Item 29, on page 21)

In the left hand column of each report, there is also a box which contains 2007-2009 *Projections* for a stock price. There you can see the potential average high and low prices we forecast, the % price changes we project, and the expected compound annual total returns (price appreciation plus dividends). To make these calculations, analysts compare the expected prices out 3 to 5 years into the future (as shown in the *Target Price Range* and *Projections* box) with the recent price (shown on the

top of the report).

Investors whose primary goal is long-term price appreciation should study the 3- to 5-year *Projections* carefully and choose stocks with above-average price appreciation potential. For comparative purposes, you can find the weekly Estimated Median Price Appreciation Potential for all approximately 1,700 stocks on the front page of the *Summary & Index*.

The *Target Price Range* and 3- to 5-year *Projections* are necessarily based upon an estimate of future earnings. They are, therefore, very subjective. These should not be confused with the *Timeliness* rank for 12-month performance, which is independent of estimates and based solely on historical data.

Annual Rates Of Change (Item 23, on page 21)

At this point, it may be helpful to look at the *Annual Rates* box in the left-hand column. This box shows the compound annual per share growth percentages for sales, "cash flow," earnings, dividends and book value for the past 5 and 10 years and also Value Line's projections of growth for each item for the coming 3 to 5 years. All rates

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '01-'03 to '07-'09
Sales	9.0%	7.5%	10.0%
"Cash Flow"	12.5%	11.0%	12.5%
Earnings	13.5%	12.5%	12.0%
Dividends	13.5%	13.5%	12.0%
Book Value	14.5%	12.0%	16.0%

Annual Rates Box
 (Also see item 23, on page 21)

of change are computed from the average number for a past 3-year period to an average number for a future period. For details, see below.

Trends are important here. Check whether growth has been increasing or slowing and see if Value Line's analyst thinks it will pick up or fall off in the future. Specific estimates for various data items for 3 to 5 years out can be found in *bold italics* print in the far right hand column of the Statistical Array (item 15).

Historical Financial Data

(26 in the example on page 21)

Many investors like to use the Statistical Array to do their own analysis. They, in particular, use the historical

data in the center of each report to see how a company has been doing over a long time frame. It is worth pointing out that while all of the data are important, different readers find different data items to be most useful.

The numbers are probably most helpful in identifying trends. For example, look at sales per share to see if they have been rising for an extended period of time. Look at operating margins and net profit margins to see if they have been expanding, narrowing or staying flat. And examine some of the percentages near the bottom, such as the Return on Shareholders' Equity, to see if they have been rising, falling, or remaining about the same.

Calculating Annual Rates of Change

(Growth Rates)

In an attempt to eliminate short-term fluctuations that may distort results, Value Line uses a three-year base period and a three-year ending period when calculating growth rates.

Example: To calculate the compound annual sales growth from 2001-2003 (the latest years for which reported actual financial results were available when our Johnson & Johnson report on page 21 went to press) to 2007-2009, we take sales per share for each of the years 2001, 2002, and 2003 and average them. Then we take the sales per share for the years 2007-2009, as shown in the far right column of the large statistical section of our report.

In the case of Johnson & Johnson, the three-year base period average is \$12.16. The three-year ending period average is \$21.40. The compound annual growth rate over the seven years from 2002 (the middle year) to 2008 (again, the middle year) is 10.0%, rounded.

Investors often try to calculate a growth rate from one starting year to one ending year, and then can't understand why the number they get is not the same as the one published by Value Line. If they used a three-year base period and three-year ending period, they would get the same results we do.

CHAPTER

5

EXAMINING A VALUE LINE
PAGE IN MORE DETAIL

In the following section, we are going to examine an actual Value Line page, with the objectives of interpreting the array of statistical data presented and weighing the data and the accompanying comment against your needs. We have chosen for examination a report on Johnson & Johnson, a large and well known manufacturer of health care products.

Putting Data in Perspective

Looking at the top of the page, we can see that Johnson & Johnson's stock price in September 2004 was \$57.66 a share (item 5 on page 21). By itself, the stock price means very little. In the line below the price, annual high and low prices for each year from 1993 through late 2004 are indicated. Below the high and low annual prices is a price chart (graph) that shows monthly price ranges for essentially the same period, along with other useful information that we will discuss below. We note here, though, that while Johnson & Johnson stock has traded in a relatively narrow range for nearly four years, it has still climbed more than sixfold from its low of 8.9 in 1993 (adjusted for stock splits in 1996 and 2001).

Is the fact that the stock has moved up so much cause for concern? Has it become overvalued? Not necessarily—as we will see. Sales per share, cash flow per share, earnings per share, and book value per share are all at historical highs, as can be seen in the Statistical Array (items 15 and 26 on page 21).

Price Earnings Ratio—This is probably the most widely used measure of stock valuation. Value Line shows a variety of P/E ratios on every company page, as discussed below:

The *P/E ratio* on the very top of the Value Line page (item 6 on page 21). This is calculated by dividing the recent price of the stock by the total of the last six months of earnings and the next six months of estimated earnings.

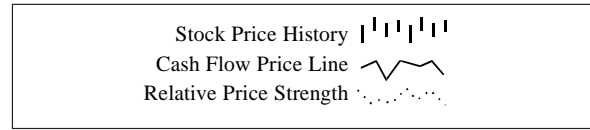
The *Relative P/E ratio* (item 8). This compares the P/E of one stock with the median of estimated P/E ratios of all stocks under Value Line review. A relative P/E of more than 1 indicates that a stock's P/E ratio is currently higher than that of the Value Line universe; a P/E of less than 1 indicates that this stock's P/E is less than the Value Line average.

The *Trailing P/E ratio* (item 7). This is calculated by dividing the recent price of the stock by the past 12 months of actual (reported) earnings. This is the figure shown in most newspapers.

The *Median P/E ratio* (item 7). This is the average annual P/E ratio of a stock over the past 10 years, with certain statistical adjustments made for unusually low or high ratios.

The *Average Annual P/E ratio* (items 15 and 26). This figure is calculated by dividing the average price for each year by the actual reported earnings for the same year and is shown in the Statistical Array.

The *Relative (Annual) P/E ratio* (items 15 and 26). This figure is calculated by dividing the *Average Annual P/E* of a stock with the *Average Annual P/E* of all stocks under Value Line review in the same year.



To gauge the significance of the recent price of a stock, the reader must look at the price in relation to a variety of data. As far as P/Es are concerned, the current P/E ratio and relative P/E ratio for Johnson & Johnson's stock, while above those of most stocks in the Value Line universe, are still quite close to the Value Line median P/E. These slightly above-average valuations underscore investors' long standing favor for this equity.

through 1999. Since then, it has traded in a broad range, generally between 40 and 60.

High P/E ratios may mean that the stock is overpriced, unless there are factors indicating that there will be a significant improvement in the company's fundamentals. Is this the case with Johnson & Johnson? Perhaps, since management has been very vigilant in its efforts to maximize returns from its businesses, and the Value Line analyst is expecting continued strong profit growth over the next three to five years. High growth rates often result in above-average price/earnings ratios. Johnson & Johnson's relative P/E ratio of 1.09 (item 8), a slightly richer valuation than found in the average stock followed by Value Line, also likely reflects the company's track record and growth expectations.

Now look at the "cash flow" line, the solid line running from 1992 through the middle of 2003, which is more fully described below. The dashed line from mid-2003 to mid-2005, which is an extension of the "cash flow" line, is Value Line's projection of the line for those years. For most of the past nine years, Johnson & Johnson's stock has traded above the "cash flow" line. More recently, the stock has moved back down to the line.

The *Dividend Yield* (item 10 in the right top corner of the page) shows the expected return from cash dividends on the stock over the next 12 months, as a percentage of the recent price. Johnson & Johnson's yield of 2.0% is above the median of all dividend paying stocks in the Value Line Universe. (The median is shown each week on the cover of the *Summary & Index* section.) We also see that the company has increased the dividend in every year since 1988, as shown in line four of the Statistical Array in the center of our report, and Value Line's analyst thinks additional increases are forthcoming. Many investors view regular increases in a dividend very positively.

Finally, look at the *Relative Strength Price* line, the faint small dotted line, usually toward the bottom of the chart. This shows the relative performance of Johnson & Johnson stock versus the entire universe of Value Line stocks; when the *Relative Strength Price* line is rising, it means a stock is acting better than the universe. When it is falling, a stock is doing worse than the Value Line universe.

The Price Chart

At the very bottom of the chart, we show volume of trading each month (item 14) as a percent of total shares outstanding. The *Legends* box (item 2) in the upper left of the price chart contains, among other things, information on the "cash flow" multiple, a record of stock splits, and whether or not there are options traded.

Next, look at Johnson & Johnson's price chart (or graph) at the top of the report. The first thing to look at is the price history, shown by the small vertical bars in the center of the graph. Those bars show the high and low monthly prices for the stock (adjusted for any subsequent stock splits or dividends). Looking at the bars, you can see that the stock price was in a strong uptrend from 1994

The *Target Price Range* (item 11) in the upper right corner of the price chart indicates where Value Line's analyst believes the stock is most likely to be selling in the 2007-09 period. This box should be viewed in conjunction with the *Projections* box (item 29) near the top left-hand corner of the page, which also gives our 3- to 5-year projections. For Johnson & Johnson, we expect the average price to hover between 80 and 100, which would be moderately above the current level.

Just above the 2007-09 PROJECTIONS box is a section containing the Value Line *Timeliness*, *Safety*, and *Technical* ranks, plus a Beta calculation. Johnson & Johnson's Beta of .65 reveals that this stock is likely to move up and down much more slowly than the typical stock on the New York Stock Exchange. If you think that the stock market will go up, you want to invest in stocks

with high Betas. If you think the market will go down or are looking for stability, a stock like Johnson & Johnson, with a low Beta is the place to be.

The “Cash Flow” Line

The price chart at the top of the Johnson & Johnson page contains, among other things, a monthly price history for the stock (the vertical bars) overlaid by a solid line that we call the “cash flow” line (sometimes also called the “Value Line”). To plot the line, we multiply cash flow per share (net income plus depreciation and amortization divided by the number of shares outstanding at the end of the year) by a number (multiple) determined by our analyst. The goal is to create a “line” that most closely matches a company’s stock price history and also “fits” the projected 3- to 5-year *Target Price Range*. In the case of Johnson & Johnson, the “cash flow” multiple is now 15. (The multiple can, and often does, change over time.)

The concept of a “cash flow” multiple is not too different from that for a Price/Earnings multiple (or ratio). The difference here is that instead of dividing the recent price of a stock by 12 months of earnings to create a P/E multiple, we divide the recent price by the total of 12 months of earnings plus 12 months of depreciation (and amortization, if there is any).

There is evidence that some stocks will generally trade at a price close to the “cash flow” line. In those cases when a stock is trading above the “cash flow” line, it will often move back down toward the “cash flow” line. When it is trading below, it will often do the opposite. In some cases, a stock may trade above or below the “cash flow” line for considerable periods of time.

Historical Results and Estimates

For each of the approximately 1,700 companies Value Line follows, we usually present per-share data going back 17 years in the Statistical Array in the center of each report. The historical data (item 26) appear on the left side and are presented in regular type. We also project statistical data (item 15) for the next fiscal year, as well as three to five years into the future. ***These projections are presented in bold italics***

Now look at a list of items in the Statistical Array (items 15 and 26).

Sales per share, in the top line, is an important series. When earnings per share are depressed because of poor net profit margins, a high level of sales per share can suggest the potential for an earnings recovery. It would be disconcerting, however, if sales per share declined in tandem with earnings per share.

“*Cash flow*” per share (second line), as commonly used by analysts, is the sum of reported earnings plus depreciation, less any preferred dividends, calculated on a per-share basis. It is an indicator of a company’s internal cash-generating ability—the amount of cash it earns to expand or replace plant and equipment, to provide working capital, to pay dividends, or to repurchase stock. Johnson & Johnson’s “cash flow” per share has expanded significantly since 1988.

Earnings per share (third line) are shown by Value Line as they were reported to stockholders, excluding nonrecurring items and adjusted for any subsequent stock splits or stock dividends. According to current accounting guidelines, companies now report earnings two ways. The first is basic earnings per share, which is the earnings available to common shareholders divided by the weighted average number of shares outstanding for the period. The second is diluted earnings per share, which reflects the potential dilution that could occur if securities or other contracts to issue common stock (like options and warrants) were exercised or converted into common stock. Value Line shows only one earnings figure in our statistical presentation; that figure is clearly identified in the footnotes (item 20), and much more often than not, it is the diluted earnings figure.

For Johnson & Johnson, earnings per share have expanded consistently over the past decade and a half. As indicated in footnote (B) (*item 20*) near the bottom edge of the report page, its earnings per share are now based on diluted shares outstanding.

Dividends Declared per share (fourth line) are usually the highest, in proportion to earnings, at older and larger companies, which tend to have slower-than-average growth. Directors of growth-oriented companies more often than not prefer to pay small or “token” dividends, or none at all, so they can reinvest earnings in the business. Johnson & Johnson has regularly paid out 34% to 38% of its earnings in dividends and invested the remainder in the business. A payout of about 25% is generally typical of larger capitalization companies followed by Value Line.

Capital Spending per share (fifth line) is the amount that a company spends on new plant and equipment. It doesn't include funds used for acquisitions of other companies.

Book Value per share (sixth line) is common shareholder's equity determined on a per-share basis. It includes both tangible assets, like plant and receivables and inventories, as well as intangibles, like the value of patents or brand names, known as "goodwill." Any significant intangibles will normally be indicated in a footnote. If all assets could be liquidated at the value stated on the company's books, all liabilities such as accounts payable, taxes, and long-term debt paid, and all preferred stockholders compensated, the book value is what would be left for the common stockholders.

The number of *Common Shares Outstanding* (seventh line) is also listed in the Statistical Array. Sometimes net income rises, but earnings per share do not, because the number of shares outstanding has increased. This may happen because a company is issuing stock to pay for acquisitions or to fund internal growth. As a result, sales and profits may soar, while per-share sales and earnings lag. On the other hand, when cash-rich companies buy their own shares, earnings per share can rise even if net income is stable. Johnson & Johnson's share base has grown slightly in the past ten years.

The *Average Annual P/E Ratio* (eighth line) shows what multiple of earnings investors have been willing to pay for a stock in the past and the P/E ratio the analyst expects out 3 to 5 years. Johnson & Johnson's average annual P/E has frequently been very high in recent years, and Value Line's analyst projects that it will be above average in the years through 2007-09.

The *Relative P/E Ratio* (ninth line) shows how the stock's price-earnings ratio relates to those of all stocks in the Value Line universe. Johnson & Johnson's relative P/E of 1.09 is 9% higher than that of the typical stock. However, its relative PE has often been even higher, and the Value Line analyst thinks it will be high again in the period to 2007-09.

The *Average Annual Dividend Yield* (tenth line) is of special interest to conservative investors, many of whom are more concerned with income than with a stock's appreciation potential. Income-oriented investors should look for stocks with yields that are higher than the average

shown each week in the center box of the front cover of the *Summary & Index*, but they should also look at the trend of dividends over time. Johnson & Johnson's dividend has been increased in each year shown on our page, and the analyst thinks it will continue to rise. Steady increases are very attractive for many investors. Investors should also look carefully at a company's Financial Strength to make certain that the company will be able to continue to pay the dividend. A good rule of thumb for conservative investors is to invest only in companies with Financial Strength ratings of at least B+.

Company Financial Data

The *Sales* figure (eleventh line) is the most common measure given when referring to a company's size. Johnson & Johnson's sales in 2004 are expected to be more than 2.9 times the amount recorded in 1994, a very strong performance.

The *Operating Margin* (twelfth line) indicates what percentage of sales is being converted into operating income. (Operating income is total sales minus the cost of goods sold and selling, general and administrative expenses. It is also referred to as EBITDA, or earnings before interest, taxes, depreciation, and amortization.) At Johnson & Johnson, the past decade has seen a rise in this figure, and the figure is expected to widen slightly more in the next 3 to 5 years.

Depreciation (thirteenth line) shows the amount charged against operating profits to reflect the aging of a company's plant and equipment. That number has risen quite steadily and is expected to continue to rise through 2007-09.

Net Profit (fourteenth line) is the amount the company earned after all expenses including taxes, but excluding nonrecurring gains or losses and the results of discontinued operations. Usually, the higher the net, the higher the per-share earnings. Johnson & Johnson's net profit has grown considerably since 1994, and has risen in every year.

Johnson & Johnson's *Income Tax Rate* (fifteenth line) has been in the 27% to 30% range for many years, and Value Line's analyst thinks it will stay there in the future. Income tax rates will normally remain steady unless the federal tax rate changes in the U.S. or unless a company increases or decreases the percentage of business it does overseas, where tax rates are different.

Net Profit Margin (sixteenth line) shows net income after taxes as a percentage of sales (or revenues). Here, the trend is the most important thing, with rising margins usually being favorable. It is often worthwhile to compare the net margin with the operating margin. Usually the two series move together, though not always. Depreciation charges, interest expense, income taxes, and other costs are deducted from (and other income added to) operating income in the determination of net profit. Where there is a disparity in the trends of the net and operating margins, it may be worth taking a second look. (If depreciation, interest charges, or tax rates move sharply in any direction, there will be an impact on net profits, and it would be worthwhile to try to determine why the change occurred.)

Johnson & Johnson's *Net Profit Margin* has been at record levels in recent years, and we expect the current high level to hold over the next 3 to 5 years.

Working Capital (seventeenth line), the company's current assets less current liabilities, indicates the liquid assets available for running the business on a day-to-day basis. The higher a company's sales, the more working capital it typically has and needs. But we caution that a number of large companies with steady revenue streams no longer believe large amounts of working capital are necessary. In those cases, a negative working capital may be perfectly acceptable because a company can meet normal operating expenses from consistent cash receipts.

Long-term Debt (eighteenth line) is the total debt due more than one year in the future. In the case of Johnson & Johnson, the amount is quite low relative to shareholder's equity.

Shareholders' Equity (nineteenth line), also known as net worth, is the total stockholders' interest (preferred and common) in the company after all liabilities have been deducted from the company's total assets. All intangible assets such as goodwill, patents, and, sometimes, deferred charges are included in shareholders' equity. Johnson & Johnson's equity has grown appreciably over the years, primarily from retained earnings.

Return on Total Capital (twentieth line) measures the percentage a company earns on its shareholders' equity and long-term debt obligations. When a company's return on total capital goes up, there should also be an increase in the return on shareholders' equity (see below). If not, it simply means that the company is borrowing more and paying interest, but not earning more for the stockholders on their equity in the company's assets. Unless a company can earn more than the interest cost of its debt over time, the risk of borrowing is not worthwhile.

Return on Shareholders' Equity (twenty-first line) reveals how much has been earned (in percentage terms) every year for the stockholders (common and preferred). Higher figures are usually desirable, often indicating greater productivity and efficiency. Johnson & Johnson's percent earned on net worth has been relatively high in recent years, and while it may slip in coming years, it is likely to remain above average.

Trends in both this ratio and the return on total capital—two key gauges of corporate performance—say a great deal about the skill of management.

Retained to Common Equity (twenty-second line) also known as the "plowback ratio," is net income less all dividends (common and preferred), divided by common shareholders' equity and is expressed as a percentage. It measures the extent to which a company has internally generated resources to invest for future growth. A high plowback ratio and rapidly growing book value are positive investment characteristics.

All Dividends to Net Profit, or "payout ratio," (twenty-third line) measures the proportion of a company's profits that is distributed as dividends to all shareholders—both common and preferred. Young, fast-growing firms reinvest most of their profits internally. Mature firms are better able to pay out a large share of earnings. Johnson & Johnson has been paying out 34% to 38% of its profits in the form of cash dividends. By way of comparison, the typical large company in the Value Line universe usually pays out about 25% of its profits in dividends.

-
1. **Value Line's Ranks**—the rank for Timeliness; the rank for Safety; the Technical rank. Beta, the stock's sensitivity to fluctuations of the market as a whole, is included in this box but is not a rank. (*See Glossary for Industry rank.*)
 2. **The Legends box** contains the "cash flow" multiple, the amounts and dates of recent stock splits and an indication if options on the stock are traded.
 3. **Monthly price ranges of the stock**—plotted on a ratio (logarithmic) grid to show percentage changes in true proportion. For example, a ratio chart equalizes the move of a \$10 stock that rises to \$11 with that of a \$100 stock that rises to \$110. Both have advanced 10% and over the same space on a ratio grid.
 4. **The "cash flow" line**—reported earnings plus depreciation ("cash flow") multiplied by a number selected to correlate the stock's 3- to 5-year projected target price, with "cash flow" projected out to 2005.
 5. **Recent price**—see page 2 of the *Summary & Index* for the date, just under "Index to Stocks."
 6. **P/E ratio**—the recent price divided by the latest six months' earnings per share plus earnings estimated for the next six months.
 7. **Trailing and median P/E**—the first is the recent price divided by the sum of reported earnings for the past 4 quarters; the second is an average of the price/earnings ratios over the past 10 years.
 8. **Relative P/E ratio**—the stock's current P/E divided by the median P/E for all stocks under Value Line review.
 9. **The stock's highest and lowest price of the year.**
 10. **Dividend yield**—cash dividends estimated to be declared in the next 12 months divided by the recent price.
 11. **Target Price Range**—the range in which a stock price is likely to trade in the years 2007-09. Also shown in the "Projections" box on the left.
 12. **Relative Price Strength** describes the stock's past price performance relative to the Value Line Arithmetic Composite Average of approximately 1,700 stocks. (A rising line indicates the stock price has been rising more than the Value Line universe.)
 13. **The % Total Return** shows the price appreciation and dividends of a stock and the Value Line Arithmetic Composite Index for the past 1, 3, and 5 years.
 14. **The percent of shares traded monthly**—the number of shares traded each month as a % of the total outstanding.
 15. **Statistical Array**—Value Line estimates appearing in the area on the right side are in *bold italics*
 16. **Business Data**—a brief description of the company's business and major products along, with other important data.
 17. **Analyst's Commentary**—an approximately 350-word report on recent developments and prospects—issued every three months on a preset schedule.
 18. **The expected date of receipt by subscribers.** *The Survey* is mailed on a schedule that aims for delivery to every subscriber on Friday afternoon.
 19. **Value Line's Indexes** of Financial Strength, Stock's Price Stability, Price Growth Persistence, and Earnings Predictability. (*See Glossary for definitions.*)
 20. **Footnotes** explain a number of things, such as the way earnings are reported, whether basic or diluted.
 21. **Quarterly dividends paid** are actual payments. The total of dividends paid in four quarters may not equal the figure shown in the annual series on dividends declared in the Statistical Array. (Sometimes a dividend declared at the end of the year will be paid in the first quarter of the following year.)
 22. **Quarterly sales** are shown on a gross basis. Quarterly earnings on a per-share basis (estimates in bold type).
 23. **Annual rates of change** (on a compound per-share basis). Actual for each of the past 5 and 10 years, estimated for the next 3 to 5 years.
 24. **Current position**—total current assets and total current liabilities, and their detail.
 25. **The capital structure** as of the indicated recent date showing, among other things, the \$ amount and % of capital in long-term debt and preferred stock. We also show the number of times that interest charges were earned.
 26. **Statistical Array**—historical financial data appears in regular type.
 27. **Stock purchases/sales by institutions**—the number of times institutions with more than \$100 million of assets under management bought or sold stock during the past three quarters and the total number of shares held by those institutions at the end of each quarter.
 28. **The record of insider decisions**—the number of times officers and directors bought or sold stock or exercised options during the past nine months.
 29. **The projected stock price** in 2007-09. Also, the total expected % gain/loss before dividends and the Annual Total Return (% including dividends).
-

Sample Value Line Stock Page

12345678910

JOHNSON & JOHNSON NYSE:JNJ										RECENT PRICE 57.66	P/E RATIO 18.7 (Trailing: 19.5; Median: 25.0)	RELATIVE P/E RATIO 1.09	DIV'D YLD 2.0%	VALUE LINE																	
TIMELINESS 2		Raised 5/28/04		High: 12.6		Low: 8.9		23.1		27.0		33.7		44.9		53.4		53.0		61.0		65.9		59.1		58.1		Target Price		Range	
SAFETY 1		New 7/27/90		15.0 x "Cash Flow" p sh		Relative Price Strength		2-for-1 split 6/02		2-for-1 split 6/96		2-for-1 split 6/01		Options: Yes		Shaded area indicates recession															
TECHNICAL 3		Lowered 8/6/04																													
BETA .65 (1.00 = Market)																															
2007-09 PROJECTIONS		Ann'l Total		Price		Gain		Return																							
High 100		(+75%)		80		(+40%)		16%		10%																					
Insider Decisions		O N D J F M A M J		to Buy 0 0 0 0 0 0 0 0 0 0		to Sell 1 6 2 3 2 1 1 1 2 0		Options 2 3 1 2 0 1 2 1 0																							
Institutional Decisions		302003 402003 102004		Percent		shares		traded																							
to Buy 607		689		698		9		6																							
to Sell 623		584		530		3		3																							
Hld's(000)180666418125031809307																															

1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	© VALUE LINE PUB., INC. 07-09	
3.38	3.66	4.22	4.67	5.25	5.50	6.12	7.27	8.11	8.41	8.80	9.88	10.47	10.83	12.23	13.42	15.60	16.70	Sales per sh ^A 21.40	
.61	.56	.65	.73	.85	.93	1.06	1.26	1.46	1.62	1.83	2.03	2.27	2.46	2.85	2.91	3.75	4.10	"Cash Flow" per sh 5.50	
.36	.41	.48	.55	.62	.69	.78	.93	1.09	1.21	1.34	1.49	1.70	1.91	2.23	2.70	3.03	3.30	Earnings per sh ^B 4.50	
.12	.14	.16	.19	.22	.25	.28	.32	.37	.43	.49	.55	.62	.70	.80	.93	1.10	1.21	Div'ds Decl'd per sh ^C 1.58	
.25	.28	.31	.37	.42	.38	.36	.48	.52	.52	.54	.62	.59	.57	.71	.73	.75	.80	Cap'l Spending per sh 1.00	
1.31	1.56	1.84	2.11	1.97	2.17	2.77	3.49	4.07	4.59	5.06	5.83	6.76	7.95	7.65	8.61	10.75	12.65	Book Value per sh ^D 19.55	
2664.6	2664.4	2664.6	2665.3	2621.6	2571.9	2572.0	2590.7	2665.0	2690.3	2688.1	2779.4	2781.9	3047.2	2968.3	3119.8	2960.0	2950.0	Common Shs Outst ^E 2900.0	
14.2	15.4	16.5	20.5	20.0	15.4	14.8	18.5	22.4	24.9	28.1	31.6	26.4	27.2	25.9	21.9	21.9	21.9	Avg Ann'l P/E Ratio 20.0	
1.78	1.17	1.23	1.31	1.21	.91	.97	1.24	1.40	1.44	1.46	1.80	1.72	1.39	1.41	1.27	1.27	1.27	Relative P/E Ratio 1.35	
2.4%	2.2%	2.1%	1.7%	1.8%	2.4%	2.4%	1.9%	1.5%	1.4%	1.3%	1.2%	1.4%	1.3%	1.4%	1.8%	1.8%	1.8%	Avg Ann'l Div'd Yield 1.8%	
CAPITAL STRUCTURE as of 6/27/04																			
Total Debt \$3,453 mill. Due in 5 Yrs \$500.0 mill.																			
LT Debt \$2,962 mill. LT Interest \$174.0 mill. (9% of Cap'l)																			
Leases, Uncapitalized Annual rentals \$143.0 mill.																			
Pension Assets-12/02 \$6,050 mill. Oblig. \$7,680 mill.																			
Pfd Stock None																			
Common Stock 2,968,107,066 shs. as of 7/25/04																			
MARKET CAP: \$171 billion (Large Cap)																			
CURRENT POSITION																			
2002 2003 6/27/04																			
Cash Assets 7475 9523 10786																			
Receivables 5399 6574 10786																			
Inventory (FIFO) 3303 3588 3528																			
Other 3089 3310 3201																			
Current Assets 19266 22995 24657																			
Accts Payable 3621 4996 3829																			
Debt Due 2117 1363 491																			
Other 5711 7089 7742																			
Current Liab. 11449 13448 12062																			
ANNUAL RATES Past Past Est'd '01-'03																			
of change (per sh) 10 Yrs. 5 Yrs. to '07-'09																			
Sales 9.0% 7.5% 10.0%																			
"Cash Flow" 12.5% 11.0% 12.5%																			
Earnings 13.5% 12.5% 12.0%																			
Dividends 13.5% 13.5% 12.0%																			
Book Value 14.5% 12.0% 16.0%																			
QUARTERLY SALES (\$ mill.)^A																			
Fiscal Year Mar.Per Jun.Per Sep.Per Dec.Per Full Fiscal Year																			
2001 8021 8342 8238 8403 33004																			
2002 8743 9073 9079 9403 36298																			
2003 9831 10322 10455 11254 41862																			
2004 11559 11484 11250 11872 46165																			
2005 12150 12250 12000 12800 49200																			
EARNINGS PER SHARE^{AB}																			
Fiscal Year Mar.Per Jun.Per Sep.Per Dec.Per Full Fiscal Year																			
2001 .50 .51 .50 .40 1.91																			
2002 .59 .60 .60 .44 2.23																			
2003 .69 .70 .69 .62 2.70																			
2004 .83 .82 .76 .62 3.03																			
2005 .88 .89 .83 .70 3.30																			
QUARTERLY DIVIDENDS PAID^C																			
Calendar Mar.31 Jun.30 Sep.30 Dec.31 Full Year																			
2000 .14 .16 .16 .16 .62																			
2001 .16 .18 .18 .18 .70																			
2002 .18 .205 .205 .205 .80																			
2003 .205 .24 .24 .24 .83																			
2004 .24 .285																			

Johnson & Johnson topped expectations in 2004's initial half, and we've raised our earnings estimate for the year. In the March quarter, the company beat our \$0.82 bottom-line estimate by a penny, with net rising 20%. It exceeded our figure by \$0.02 (and consensus by \$0.03) in the second period, posting a 17% year-over-year increase. Revenues were up 11.3% in the most recent quarter, 8.5% on a constant currency basis. Significantly, too, sales growth was solid across all three major businesses, with pharmaceuticals, medical devices & diagnostics, and consumer expanding by 11.1% (to \$5.4 billion), 11.8% (\$4.1 billion), and 10.0% (\$2.0 billion), respectively. An enriched sales mix, meantime, along with cost-cutting initiatives, added 1.2 percentage points to the gross margin. In view of both the out-performance and the receding prospect of generic rivals for Duragesic, we've updated (by \$0.06) our estimate for 2004 to \$3.03, in line with management's guidance.

The bottom-line advance will likely continue to decelerate, though, slowing into single-digit territory in 2005. Sales of Procrit/Eprex, J&J's best-seller,

are under substantial competitive and pricing pressures, as underscored by a 14% (or \$137 million) drop in the June quarter. Top-line contributions from another key growth driver, Cypher (drug eluting stent), is also being squeezed mightily, by Boston Scientific's *Taxus*, which was launched in March. And, early next year, Duragesic, which we estimate will add about \$2 billion to 2004 sales, will undoubtedly face stiff competition from generics. J&J has a decent new-drug pipeline, but we think the share-net advance will be about 9% in 2005, compared with 12% this year and 21% in 2003.

These top-quality shares still deserve consideration. The healthcare products giant has almost \$11 billion in cash. As well, it generates some \$6 billion annually in free cash flow. Thus, management has ample financial flexibility with which to transfigure the company's growth profile. Major acquisitions and/or stock repurchases are clearly viable options. J&J stock is timely for the year ahead. Moreover, it also offers good risk-adjusted, 3- to 5-year total-return potential.

George Rho
September 3, 2004

(A) Year ends on last Sunday of December.	(D) Incl. intang.: '03, \$12.2 billion,	Company's Financial Strength	A++
(B) Primary earnings through '96, diluted thereafter. Excludes nonrecurring gains/(losses); '90, '9c, '92, '23c, '98, '22c; '99, '2c; '01, '7c; '02, '7c; '03; Q2, '30c). May not sum to total due to rounding. Next earnings report due mid-Nov.	(E) In mill., adj. for stock splits.	Stock's Price Stability	95
(C) Dividends historically paid mid: March, June, Sept., Dec. Div'd reinvestment plan		Price Growth Persistence	90
		Earnings Predictability	100

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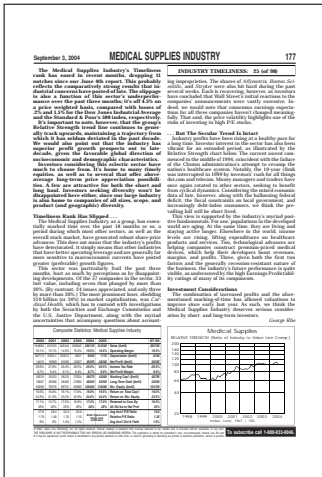
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CHAPTER

6

THE VALUE LINE
 INDUSTRY REPORT



All the company reports in *The Value Line Investment Survey* are grouped by industry, and at the front of each industry group is a one- or two-page Industry Report.

The information contained in each Industry Report may differ considerably from one industry to another, but there is a general format we follow.

The text normally includes comments about important developments in the industry and the impact those developments have been having on the companies. It also usually includes the analyst's projections about the immediate and longer-term prospects for the industry. We always recommend that you read this report to get an idea of just what an analyst thinks about an industry.

Composite Statistics

In the lower left corner of most reports is a table of Composite Statistics for an industry. The statistics are compiled from the data on the individual companies; the individual data headings are the same as those on the company pages.

The number of industries followed in *The Value Line Investment Survey* is constantly changing. As companies drop out, usually because of mergers or acquisitions, we may discontinue an industry. On the other hand, as new industries develop, we add them. Some we have added in the past two years are Biotechnology, Human Resources, Entertainment Technology, and Coal.

Analytical Commentary

Much of each page contains analytical commentary. The text in each report is written by a Value Line security analyst, who normally also follows a number (sometimes as many as 10 or 12) of the companies in the industry.

Composite Statistics: Medical Supplies Industry							
2000	2001	2002	2003	2004	2005		07-09
164858	201055	248344	268645	290135	312500	Sales (\$mill)	382700
16.1%	15.1%	14.5%	15.2%	15.5%	15.5%	Operating Margin	15.5%
5577.5	6350.1	6330.5	6621	6940	7175	Depreciation (\$mill)	8150
14415	16869	20095	22627	25295	28200	Net Profit (\$mill)	36355
29.6%	27.8%	29.4%	29.5%	29.5%	29.5%	Income Tax Rate	29.5%
8.7%	8.4%	8.1%	8.4%	8.7%	9.0%	Net Profit Margin	9.5%
30578	32333	38233	37624	39275	42000	Working Cap'l (\$mill)	48750
18597	25586	28450	27065	26000	25000	Long-Term Debt (\$mill)	22000
63058	79376	86741	95895	106480	118285	Shr. Equity (\$mill)	154700
18.5%	16.8%	18.1%	17.8%	19.0%	19.5%	Return on Total Cap'l	19.0%
22.9%	21.3%	23.2%	22.9%	24.0%	24.0%	Return on Shr. Equity	23.5%
17.1%	15.7%	17.5%	16.8%	17.0%	17.0%	Retained to Com Eq	16.5%
25%	26%	25%	25%	28%	28%	All Div'ds to Net Prof	30%
27.6	28.4	24.4	20.8			Avg Ann'l P/E Ratio	19.0
1.79	1.46	1.33	1.15			Relative P/E Ratio	1.25
.9%	.9%	1.0%	1.2%			Avg Ann'l Div'd Yield	1.6%

These statistics have two primary uses. First, they help an investor to examine trends in an industry. Second, they provide a benchmark for comparisons. An investor can look at the statistics on an individual company page and compare them with those of the industry to see how a company stacks up with its industry. He/she can also compare one industry with another.

Industry Trends

When purchasing a stock in a company, an investor should also know something about the industry in which a company is operating. Some important questions are:

- Is the industry growing?
- Are the industry's operating and profit margins growing or at least remaining steady?
- Are the industry's returns on total capital and shareholders' equity growing or at least remaining steady?

The answer to these questions can be found in the Composite Statistics table. In most cases, if an industry's trends are favorable, the operating conditions for the companies in that industry will also be favorable. If the industry trends are negative, the opposite may be true.

Company/Industry Comparisons

When you are investing in a company, you should also know how that company is performing relative to its industry. A company's size and operating performance are both very important, and you should study them by looking at our individual company pages. However, you should also know if a company is well run. Some questions an investor should ask are:

- How do a company's operating margins compare with the industry's operating margins?
- How do a company's net profit margins compare with the industry's margins?
- Are a company's returns on total capital and on shareholders' equity greater or smaller than those of the industry?

If a company's margins and returns are above average, the company is probably efficiently run. If the margins and returns are lower than most firms in the industry, the company is probably not being run as well as it could be.

WARNING! Many industries are dominated by one or two companies. When that is the case, company/industry comparisons may not be very useful. Examples here are Anheuser-Busch, which accounts for more than half the sales in our Alcoholic Beverage Industry, and Dow Chemical and Dupont, which together have more 80% of the sales of our Basic Chemical Industry. *Be careful when making company/industry comparisons to make certain the comparisons are meaningful.*

Industry Timeliness

At the top right of each report, we publish an INDUSTRY TIMELINESS rank. These go from 1 (highest) to 98 (lowest).

The Industry Timeliness ranks are calculated by averaging the Timeliness ranks of each of the stocks in a particular industry. If an industry has a large number of stocks ranked 1, the Industry Timeliness rank is likely to be high. If an industry has a large number of stocks ranked 5, the Industry rank is likely to be low.

The Industry ranks are updated weekly and published on the front and inside pages of the *Summary & Index*. You should always look in the *Summary & Index* to make certain you have the most recent numbers.

Relative Strength Chart

In the lower right corner of most reports is a relative strength chart going back for as many as seven years. Relative strength compares the price of a stock over time with the price of the stock market over the same time. (In this case, we use the Value Line Composite Index of approximately 1,700 stocks to represent the market.) When the relative strength line is rising, it means that the stocks in an industry are stronger than the broad market. When the line is falling, the stocks in an industry are weaker than the broad market.

CHAPTER

7

ANSWERS TO FREQUENTLY ASKED QUESTIONS

*Long-term subscribers to **The Value Line Investment Survey** are often well aware of the basic tenets of investing and the many ways information can be used in **The Value Line Investment Survey**. However, they and many newer readers often have questions about material in the publication. Below are answers to those questions we receive most frequently.*

TIMELINESS RANKS

How do you determine the *Timeliness* rank, and what makes it change?

TIMELINESS	2	Raised 5/28/04
SAFETY	1	New 7/27/90
TECHNICAL	3	Lowered 8/6/04
BETA	.65	(1.00 = Market)

Ranks Box
(Also see item 1, on page 21)

Value Line's *Timeliness Ranking System* ranks all of the approximately 1,700 stocks in our universe for relative price performance in the coming six to 12 months. At any one time, 100 stocks are ranked 1; 300 are ranked 2; approximately 900 are ranked 3; 300 are ranked 4; and 100 are ranked 5. In simple terms, *Timeliness* ranks [which go from 1 (Highest) to 5 (Lowest)] are determined by a company's earnings growth and its stock's price performance over a 10 year period. A rank may change

under three circumstances. The first is the release of a company's earnings report. A company that reports earnings that are good relative to those of other companies and good relative to the numbers we had expected may have its stock move up in rank, while a company reporting poor earnings could see its stock's rank drop.

A change in the price of a stock can also cause a stock's rank to change. A change in price carries less weight than a change in earnings, but it is still an important determinant. Generally speaking, strong relative price performance is a plus, while negative relative price performance (relative to all other approximately 1,700 stocks) is a minus.

And finally, there is the "Dynamism of the Ranking System." This phrase means that a stock's rank can change even if a company's earnings and stock price remain the same. That's because a fixed number of stocks is always ranked 1, 2, etc. Every time one stock's *Timeliness* rank moves up or down, another's must also change. As an example, let's suppose one company reports unusually good earnings, causing its stock's *Timeliness* rank to rise from 2 to 1. Since there can be only 100 stocks ranked 1, some other stock must fall to a rank of 2, even though there has been no change in its earnings or price.

Can you tell me where a particular stock ranks within its class (a high 1, a low 1, etc.)?

We do not disclose this information. However, we do list the date when a rank last changed and what the direction of the change was. Next to the *Timeliness* rank

on each company page you can see when the last change occurred and whether it was raised or lowered. Changes are also indicated each week in the *Summary & Index* by an arrow next to *Timeliness* ranks.

I think that *Value Line* should change a certain stock's rank. Will you do it?

We appreciate your interest, but all ranks are generated by computer driven criteria and historical data. *Value Line* methodology keeps our System objective and unbiased, because the same criteria apply to all stocks.

Would you tell me the formula you use to calculate ranks?

The details of the formula are proprietary. The components of the *Timeliness Ranking System*, as mentioned earlier, include the long-term trend of earnings and stock prices, recent company earnings and stock price performance, and a comparison of the latest quarterly earnings with those that had been expected. (Better than expected earnings are normally positive, less than expected earnings, negative.) We cannot be more specific than that.

Why do stocks with *Timeliness* ranks of 1 or 2 sometimes have below-average, long-term appreciation potential, and vice versa?

Probably the most important thing for all readers to know is that **the time horizons for *Timeliness* ranks and for 3- to 5-year Projections are very different.** Our *Timeliness* ranks are for the relative performance of stocks over the coming six to 12 months. Our forecast for long-term price potential is for 3 to 5 years. Because of the very different time periods, our forecasts for the two periods can be very different.

To provide a more specific answer, stocks ranked 1 or 2 for *Timeliness* often have been moving higher and often sell at high price/earnings ratios. While we think these stocks will continue to outperform other stocks in the *Value Line* universe during the next six to 12 months, it is unrealistic to think a stock's price will keep moving up forever. At some point, earnings growth is likely to slow, at least somewhat, and our analysts try to be as realistic as possible in calculating the 3- to 5-year projections. If earnings growth slows in the future, a stock's price/earnings ratio is likely to narrow, limiting the potential for appreciation in the stock's price.

Why do some stocks not have a *Timeliness* rank?

Our computer-generated *Timeliness* ranks require at least two years of income statement and stock price history. If a stock has been trading for less than two years, possibly because a company is relatively new or because there was a major spinoff or acquisition, we are unable to assign a rank to it. We also suspend *Timeliness* ranks for unusual developments such as a merger offer or a bankruptcy filing.

TECHNICAL RANK

What exactly is the Technical rank?

The Technical rank uses a stock's price performance over the past year to attempt to predict short-term (three to six month) future returns. Each stock in our 1,700-company universe is ranked in relation to all others on a scale of 1 (Highest) to 5 (Lowest). There are no other factors incorporated into the model. While our Technical rank does contribute to investment decisions, we would like to stress that our primary investment advice is based on our successful time-proven *Timeliness Ranking System*. The Technical rank is best used as a secondary investment criterion.

EARNINGS

Why does *Value Line* sometimes show different share earnings than those in a company's annual report, or in The Wall Street Journal, or in a brokerage house report?

We each calculate earnings differently. In particular, *Value Line* excludes what we consider to be unusual or one-time gains or charges in order to show what we consider to be "normal" earnings.

Company earnings often contain one-time non-recurring or unusual items, such as expenses related to the early retirement of debt, a change in accounting principles, restructuring charges, or a gain or loss on the sale of assets. In order to make a reasonable comparison of core operating results from one year to the next—or from one company to another—it is necessary to exclude these items from reported earnings. Some items are relatively easy to take out because they are explicitly shown in the company's income statement and footnotes. Others, however, must be estimated by our analysts. Any unusual adjustments to reported earnings will be disclosed in the footnotes of each *Value Line* report.

OPERATING MARGIN

What is an operating margin?

The operating margin shows operating income (earnings before the deduction of depreciation, amortization, interest, and income taxes) as a percentage of sales or revenues. Operating income is sometimes referred to as EBITDA.

PRICE/EARNINGS RATIO

Why does the Value Line price/earnings ratio often differ from that in The Wall Street Journal or brokerage reports?

All price/earnings ratios are calculated by dividing the recent stock price by 12 months of earnings. The different ratios occur because we each use different 12-months earnings figures. Newspapers use 12-months trailing (i.e., reported) earnings. *Value Line* uses a total of the past six months of trailing earnings and the next six months of estimated earnings. (In our view, this is the best method since it incorporates both recent history and a near-term forecast.) Your broker is likely to use a calendar year's earnings. While we think our method is best, none is wrong. Just be sure that when you are comparing two companies' P/E ratios, you are using the same methods.

For additional information on P/E ratios, please turn to page 15.

ABBREVIATIONS

I have trouble understanding some of your abbreviations. Can you help me?

Yes. Most of the frequently used abbreviations are included in the Glossary at the end of this guide.

SELECTION & OPINION MODEL PORTFOLIOS

How are stocks chosen for the Model Portfolios I, II and III in *Selection & Opinion*?

Each portfolio is dedicated to a different investment objective. To guard against near-term underperformance, none of the portfolios can hold a stock that is ranked below 3 (Average) for *Timeliness*. *Timeliness* ranks range

from 1 (Highest) to 5 (Lowest). To make it more attractive and useful to conservative investors, Portfolio II must hold stocks that are ranked at least 3 (Average) for *Safety*.

Portfolio I, Stocks with Above-Average Year-Ahead Price Potential, is built on Value Line's well-respected *Timeliness* Ranking System. It is primarily suitable for investors who wish to take more risk in hopes of greater returns than might be afforded in Portfolios II or III. To qualify for purchase, stocks have to be ranked 1 (Highest) for *Timeliness*. To reduce portfolio turnover (and recognizing the fact that many good growth stocks go up and down in price along the way), a stock that drops a rank in *Timeliness* to 2 (Above Average) may remain in the portfolio, assuming that the company's longer-term fundamentals remain sound. A stock that drops to 3 (Average) for *Timeliness* must be sold. We attempt to diversify the holdings as much as possible, but note that the *Timeliness Ranking System* tends to favor high earnings growth and more volatile issues that may cluster in a few industries.

Portfolio II, Stocks for Income and Potential Price Appreciation, attempts to combine our *Timeliness Ranking System* with an investment objective for above-average income. This portfolio is primarily suitable for more conservative investors. To qualify for purchase, a stock's yield (the estimated annual dividend for the next 12 months divided by the recent stock price) must be higher than the median yield for all approximately 1,700 stocks Value Line follows. The median is shown on the cover of the *Summary & Index* each week. The stock must also have a *Timeliness* rank of at least 3. The higher-than-average yields provide support to the shares in down markets. This portfolio tends to be less volatile because the companies, as a whole, are more likely to be mature and predictable.

Portfolio III, Stocks with Long-Term Price Growth Potential, is based on the fundamental research of our staff of research analysts. This portfolio is suitable for investors with a 3- to 5-year horizon; in terms of risk, it falls somewhere between Portfolios I and II. This portfolio tends to be the most flexible, allowing purchases of a broader array of companies. It is constructed under the principles of modern portfolio theory, which state that the risk of a portfolio should be viewed within the context of a portfolio as a whole, rather than judging the portfolio according to the average rankings of individual securities it holds. To that end, this portfolio is generally well diversified, comprising stocks in a variety of different non-related industries.

The Selected Investments section of *Selection & Opinion* has three portfolios. Why isn't there a "Conservative" portfolio?

Portfolio II, Stocks for Income and Potential Price Appreciation, is the one we would recommend for "conservative" investors. A key criterion for this portfolio is that the stocks have above-average dividend yields. These attractive yields lend support to stock prices when the market is declining. This portfolio usually also has slightly lower-than-market risk (volatility) as measured by the average beta of the portfolios.

How have the Model Portfolios done?

We publish the record quarterly in *Selection & Opinion*, usually three or four weeks after the end of a quarter. We also publish them on our Web site in the section called "About Value Line."

FINANCIAL STRENGTH

What goes into the Financial Strength rating for each individual company?

Company's Financial Strength	A++
Stock's Price Stability	95
Price Growth Persistence	90
Earnings Predictability	100

Financial/Stock Price Data
(Also see item 19, on page 21)

Our Financial Strength ratings take into account a lot of the same information used by the major credit rating agencies. Our analysis focuses on net income, cash flow, the amount of debt outstanding, and the outlook for profits. Other factors also enter into the equation. For example, a company that faces the loss of patent protection on a key product might face a downgrade. The ratings range from A++ (Highest) to C (Lowest), in nine steps, based on the judgment of our senior staff members.

A STOCK'S 3- TO 5-YEAR PRICE PROJECTIONS

How are a stock's 3- to 5-year share-price projections derived?

Our analysts have developed comprehensive spreadsheet models that take into account the current eco-

nomie climate and a company's operating fundamentals, including recent management initiatives, the actions of the competition, and many other relevant factors for each company. These models are used to develop our earnings and other financial projections for the coming 3 to 5 years.

The *Target Price Range* is calculated by multiplying a company's estimated earnings per share for the period out 3 to 5 years (in the far right hand column of the statistical array) by the stock's projected average annual price/earnings ratio for the same period and then developing a range showing the likely high and low price. The width of the band of the share-price projections varies, depending on the *Safety* rank of the company. Riskier stocks have a wider band, safer stocks a narrow band.

STOCK DECLINES

I bought a stock based on your advice, but it went down. What happened?

As you undoubtedly know, our *Timeliness Ranking System* has worked extremely well over time. Not all stocks do as we forecast, though, and we have never suggested that they will. What we have strongly recommended is that you diversify your portfolio by purchasing at least six stocks in at least six or more industries. That way, you will protect yourself from unexpected changes in the price of any one stock or any one industry. Also keep in mind that the *Value Line Ranking System* is relative. In declining markets, group 1 and 2 stocks have historically declined less than the general market. On the other hand, stocks ranked 1 and 2 have outperformed the market during periods when stock prices were rising.

SPEAKING TO ANALYSTS

I would like to speak to the Analyst who wrote a report.

Unfortunately, this isn't practical. Our staff of approximately 70 analysts has been hired and trained to analyze stocks and write commentaries for *The Value Line Investment Survey* and, to be fair to all subscribers, they do not have time to provide personalized advice or information.

PRETAX INCOME

Where can I find pretax income on a Value Line page?

You can't. We do, however, show net profit after taxes (usually line 14 in the Statistical Array) and the effective tax rate (usually line 15). You can calculate pretax income by dividing net profit by: 1 minus the tax rate. Example: If net profit was \$100 million and the tax rate was 36%, pretax profit would be \$156.25 million.

$$\frac{\$100,000,000}{1.00 - .36} = \$156,250,000$$

ERRORS IN REPORTS

What should I do if I find an error in a report?

If you think you have found an error in any of our publications, we would very much like to hear from you so that we can correct the mistake. Please write or call us. If you call, let the operator know that you want to report an apparent error, and he/she will connect you with an administrative assistant in the Research Department. Please address your written comments to the office of the Research Director, or e-mail us at VLIS@valueline.com.

If you believe you have found an error in an historical price or per share data item, please read on:

We actually receive very few complaints about our data. Most of those that we do get relate to historical prices and per share data, and the fact is that our stock prices, earnings, and other data are usually correct. When there appears to be a difference in stock prices or earnings per share, it is usually because of a stock split or a stock dividend. Value Line (and everyone else) retroactively adjusts historical stock prices and share data for stock splits and dividends. Splits and dividends of 10% or more are shown in the *Legends* box in the upper left hand corner of the price chart. Splits of less than 10% are shown in the footnotes.

INTERNET (WEB) SITE

Does Value Line have a Web site?

Yes, we do. Our address is www.valueline.com. The Web site includes useful features for today's informed investor.

The Web site is designed to help keep you informed about the stock market and the stocks you are interested in. There is a section where you can get recent stock prices and news on companies you are interested in, and another where you can set up your own portfolios. Three times each day we provide both written and video commentary from our economist and senior portfolio managers. Each afternoon we provide the latest analysis from our security analysts about selective stocks in the news that day. We also archive all issues of *The Value Line Investment Survey* published in the past three months.

To access some of this data, you must be a subscriber. To enter the "subscriber-only" section, you must enter your user code (your subscriber number on the label of your weekly envelopes) and password ("stocks").

COMPANY COVERAGE

Does a company pay to be included in *The Value Line Investment Survey*?

No. Value Line is not compensated by the companies under our review. This allows us to be totally objective when we analyze companies in *The Value Line Investment Survey*.

Does the roster of stocks covered by *Value Line* change?

Yes. Vacancies constantly occur within our approximately 1,700 stock universe. Sometimes a company's earnings will deteriorate to such a degree that we believe investors have lost interest. If that happens, we will discontinue coverage. More frequently, companies leave our universe when they are acquired by or merged with another firm. Acquired or merged companies will be replaced by others. In choosing replacements, we try to select actively traded stocks with broad investor interest.

Why isn't ABC, Inc., a large well known company, included?

We do try to include companies with actively traded stocks, which have broad public interest. If ABC fits in this category, we will, in all likelihood, provide coverage in the future.

GROWTH RATES

How are the growth rates calculated in the Annual Rates of change box?

We use a compound annual rate that reflects the annual change for various items over the entire period

being computed. All rates of change are computed from the average figure for a past 3-year period to an average for a future 3-year period. For more details, see page 14.

ANNUAL RATES	Past	Past	Est'd '01-'03
of change (per sh)	10 Yrs.	5 Yrs.	to '07-'09
Sales	9.0%	7.5%	10.0%
"Cash Flow"	12.5%	11.0%	12.5%
Earnings	13.5%	12.5%	12.0%
Dividends	13.5%	13.5%	12.0%
Book Value	14.5%	12.0%	16.0%

Annual Rates Box
(Also see item 23, on page 21)

GLOSSARY

Aaa Corporate Bond Rate—the average yield on corporate bonds rated Aaa by Moody’s Investors Service. Bonds that are rated Aaa are judged to be of the best quality compared to all other corporate bonds.

After-Tax Corporate Profits—*see Corporate Profits.*

AFUDC—*see Allowance for Funds Used During Construction.*

Allowance for Funds Used During Construction (Electric Utility Industries)—a non cash credit to income consisting of equity and debt components. This non cash income results from construction work in progress and is expected to be converted into cash income at a future date.

American Depositary Receipts (ADRs)—since most other nations do not allow stock certificates to leave the country, a foreign company will arrange for a trustee (typically a large bank) to issue ADRs (sometimes called American Depositary Shares, or ADSs) representing the actual, or underlying, shares. Each ADR is equivalent to a specified number of shares (the ratio is shown in a footnote on the Value Line page).

American Stock Exchange Composite—a market-capitalization weighted index of the prices of the stocks traded on the American Stock Exchange.

Amortization—an accounting method that reduces the value of an asset on a regular basis over time.

Analyst’s Commentary—an approximate 350-word report on each company page in *Ratings & Reports* on recent developments and prospects—issued every three months on a preset schedule.

Annual Change D-J Industrials (Investment Companies)—the yearly change from year end to year end in the Dow Jones Industrial Average, expressed as a percentage.

Annual Change in Net Asset Value (Investment Companies)—the change in percentage terms of the net asset value per share at the end of any given year from what it was at the end of the preceding year, adjusted for any capital gains distributions made during the year.

Annual Rates of Change (Per Share)—compound yearly rates of change of per-share sales, cash flow, earnings, dividends, and book value, or other industry-specific, per-share figures, over the past 10 years and five years and estimated for the coming three to five years. Historical rates of change are computed from the average figures for a past three-year period to the most

recent actual three-year period. Forecasted rates of change are computed from the average figure for the most recent three-year period to an average for a future three-year period. If data for a three-year period are not available, a two- or one-year base may be used.

Annual Total Return—a compound yearly return to shareholders that includes both stock price appreciation and dividend returns.

Annuity—a form of contract sold by life insurance companies that guarantees a fixed or variable payment at some future time.

Arithmetic Average—a simple mean. Items to be averaged are added and their sum is divided by the number of items. The result is an arithmetic, or simple, average (or mean).

Asset Quality (Bank and Thrift Industries)—an indicator of problem loans and other assets relative to total assets. A bank with good asset quality, for example, has a lower percentage of problem loans than the average bank.

Asset Value Per Share Year End (Investment Companies)—total common equity at year end, with securities valued at market rather than cost, divided by the number of shares outstanding at year end.

Assets—for a corporation, the total of current assets (normally cash and short-term investments, inventories, and receivables) and long-term assets (normally including property and equipment and good will).

Assets Year End (Investment Companies)—total investment company assets at market value, including stocks, bonds, government securities, and cash, at year end.

Available Seat Miles (ASM) (Air Transport Industry)—a measure of the airline seating capacity available for sale. Each ASM is one seat flown one mile.

Average Annual Dividend Yield—dividends declared per share for a year divided by the average annual price of the stock in the same year, expressed as a percentage.

Average Annual P/E ratio—is calculated by dividing the average price for a year with the actual reported earnings for that year and is shown in the Statistical Array.

Average Annual Price Earnings (P/E) Ratio—the average price of the stock for the year divided by earnings per share (excluding nonrecurring items, as determined by Value Line) reported by the company for the year. In the case of fiscal-year companies, all data are for the fiscal year. (*See also Price/Earnings ratio.*)

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- Average Interest Rate Paid** (Financial Services Industries)—the interest paid during the year divided by the average debt outstanding.
- Average Price for the Year**—the sum of the 52 Wednesday closing prices for a stock for the year divided by 52.
- Backlog**—orders for goods and services that have been received but not yet delivered or rendered.
- Balance Sheet**—financial statement that lists the assets, debts, and owner's investment as of a specific date.
- Basic Earnings Per Share**—net income divided by the weighted average number of common shares outstanding during a period. (This calculation is required by the Financial Accounting Standards Board for all years ending after December 15, 1997.)
- Basis Point**—in the context of discussions on interest rates, one basis point equals one-hundredth of one percentage point.
- Beta**—a relative measure of the historical sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Index. A Beta of 1.50 indicates a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Index. The "Beta coefficient" is derived from a regression analysis of the relationship between weekly percentage changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are adjusted for their long-term tendency to converge toward 1.00.
- Bond**—a long-term debt instrument, characterized typically by fixed, semiannual interest payments and a specified maturity date.
- Book Value Per Share**—net worth (including intangible assets), less preferred stock at liquidating or redemption value, divided by common shares outstanding.
- Business Data**—a section on a Value Line company report that describes the company's most important products, lists large shareholders, and includes the company's address, telephone number, and Internet address.
- Capacity at Peak** (Electric Utility Industry)—a utility's generating capability plus purchases from other utilities less sales to other utilities.
- Capacity Utilization**—the ratio of actual production levels to maximum possible production levels, expressed as a percentage. The Federal Reserve Board publishes capacity utilization figures monthly for both the overall economy and individual industries.
- Capital Funds** (REIT Industry)—stockholders' equity (net worth) plus subordinated debt.
- Capital Gains Per Share After Tax** (Real Estate Industry)—profits derived net of income taxes on the sale of property (either land or buildings) during the year, expressed in terms of the number of common shares outstanding at yearend.
- Capital Spending Per Share**—the outlays for plant and equipment for the year expressed on a per-share basis. Excludes funds spent for acquisitions.
- Capital Structure**—a balance sheet item defined by Value Line as the total of a company's long-term debt, preferred stock at liquidation or redemption value, and its shareholders' equity.
- Capitalization** — see **Market Capitalization**.
- Cash Assets**—the sum of cash on hand plus short-term securities, such as Treasury bills, that can readily be converted into cash.
- "Cash Flow"**—the total of net income plus non-cash charges (depreciation, amortization, and depletion) minus preferred dividends (if any). See **Free Cash Flow**.
- "Cash Flow" Line**—also known as the "Value Line." See page 17 for more information.
- "Cash Flow" Per Share**—net profit plus non cash charges (depreciation, depletion, and amortization), less preferred dividends (if any), divided by common shares outstanding at year end.
- CD**—abbreviation for Certificate of Deposit. See also **Time Deposits**.
- Certificate of Deposit**—see **Time Deposits**.
- Closed-End Investment Company (or Fund)**—a company or fund that has a relatively fixed number of shares (hence the term "closed-end") that are bought or sold through broker/dealers on the stock exchange. In contrast, an open-end (or mutual) fund stands ready (continually) to redeem shares for cash or issue new shares for cash and, hence, deals directly with its investors.
- Combined Ratio** (Insurance [Property/Casualty] Industry)—the percentage of losses to premiums earned plus the percentage of expenses to premiums written. The break-even point is 100%; in other words, a combined ratio of less than 100% represents an underwriting profit and a combined ratio of more than 100% represents an underwriting loss.
- Common Equity Ratio**—shareholder's equity divided by total capital (i.e., long-term debt, preferred equity, and common equity).
- Common Shares Outstanding**—the number of shares of common stock actually outstanding at the end of a company's accounting year. This total excludes any

shares held in the company's treasury. The figures for common shares outstanding in previous years are fully adjusted for all subsequent stock splits and stock dividends.

Common Stock to Surplus (Insurance Industries)—the market value of the common stock held in the insurance company's investment portfolio divided by statutory net worth.

Compound Growth—the annual rate of growth of an investment when dividends or interest are reinvested.

Consumer Price Index—a Labor Department index, published monthly, designed to reflect changes in the cost of living. Housing, food, beverage, and transportation costs account for about 80% of the value of the index, which is a measure of inflation at the consumer level.

Conversion Price—the effective price paid for common stock when the stock is obtained by converting either convertible preferred stock or convertible bonds or debentures. For example, if a \$1,000 bond is convertible into 20 shares of stock, the conversion price is \$50, that is, \$1,000 divided by 20.

Convertible Debentures—long-term debt instruments, not secured with collateral, that may be converted into a specified number of shares of common stock.

Convertible Preferred Stock—preferred stock that may be converted into a specified number of shares of common stock.

Corporate Profits—the aggregate of all profits for U.S. corporations reported by the Commerce Department as part of the domestic income and product (GDP) accounts. Reported both on a pretax and aftertax basis. They are somewhat different from profits reported to shareholders and profits reported for tax purposes.

Current Assets—assets that may reasonably be expected to be converted into cash, sold, or consumed during the normal operating cycle of a business, usually 12 months or less. Current assets usually include cash, receivables, and inventories.

Current Liabilities—financial obligations that will have to be satisfied within the next 12 months. Current liabilities include accounts payable, taxes, wage accruals, and total short-term debt, or Debt Due (the sum of notes payable and the portion of long-term debt maturing in the operating year).

Current Position—the components of a company's working capital are presented in this table in Value Line reports on industrial companies. The difference between current assets and current liabilities is known as Working Capital.

Current Ratio—the sum of current assets divided by the sum of current liabilities.

Cyclical Stock—stocks of companies whose earnings tend to fluctuate with the economy (the opposite of a growth stock, which is defined below).

d—a deficit, or a loss.

Debenture—a long-term debt instrument that is usually not secured by collateral.

Debt—see Total Debt, Long-Term Debt, Debt Due, and Total Debt Due in 5 Years.

Debt Due—the sum of bank notes and other notes payable in 12 months (or less) and that portion of long-term debt due within 12 months. See also Total Debt Due in 5 Years.

Demand Deposits (Bank Industries)—deposits that a depositor may withdraw from his account at any time.

Depletion—an accounting method that allows companies extracting oil, gas, coal, or other minerals to gradually reduce the value of these natural resources.

Deposits (Bank Industries)—total savings (time and demand deposits) entrusted to a bank.

Deposits (Thrift Industry)—funds that have been entrusted to a thrift.

Depreciation—an amount charged against operating profits to reflect the aging of plant and equipment owned by a company.

Diluted Earnings Per Share—net income (with certain possible adjustments) divided by the weighted average number of shares outstanding during a period, assuming any securities or other contracts to issue common stock (including options and warrants) were exercised or converted into common stock. (This calculation is required by the Financial Accounting Standards Board for all years ending after December 15, 1997.)

Dilution—the reduction in earnings associated with the hypothetical conversion of convertible securities into common stock. Also, in the context of a discussion of a merger or acquisition, the reduction in share earnings estimated to occur as a result of the merger or acquisition.

Discount From or Premium Over Net Asset Value (Investment Companies)—the difference between the net asset value and market price, expressed as a percentage of net asset value. If the price exceeds the net asset value, the percentage of the excess or premium is shown with a plus sign.

Disposable Income—a Commerce Department figure published monthly that reflects personal income less income taxes and other taxes. Conceptually, the statistic is designed to reflect funds available for consumers to spend or save.

Dividend—a payout to shareholders determined by a Board of Directors.

Dividend Yield—the year-ahead estimated dividend yield (shown in the top right-hand corner of the Value Line page) is the estimated total of cash dividends to be declared over the next 12 months, divided by the recent price of the stock.

Dividends Declared Per Share—the common dividends per share declared (but not necessarily paid) during the company's operating, fiscal year (displayed within the Statistical Array of the Value Line page). See also Dividends Paid Per Share.

Dividends Paid Per Share—the common dividends per share paid (but not necessarily declared) during the calendar year (indicated in the quarterly dividend box in the bottom left corner of the Value Line page). See also Dividends Declared Per Share.

Dow Jones Industrial Average—a price-weighted average of 30 of the largest U.S. industrial companies, published by Dow Jones & Co.

Dow Jones Transportation Average—a price-weighted average of 20 of the largest U.S. transportation companies, published by Dow Jones & Co.

Dow Jones Utility Average—a price-weighted average of 15 of the largest U.S. utility companies, published by Dow Jones & Co.

Downstream (Petroleum [Integrated] Industry)—the refining and marketing operations of an integrated oil company, as opposed to exploration and production activities (which are referred to as upstream operations).

Durable Goods—products used by consumers or businesses that are expected to last three or more years. These goods tend to be big-ticket items (for example, automobiles and washing machines). Durable goods sales are generally interest rate sensitive and correlate with the overall level of economic activity.

Dynamism—see page 24.

Earned Surplus—see *Retained Earnings*

Earnings—see also Net Profit. A company's total profit before nonrecurring gains or losses, but after all other expenses.

Earnings Per Share—net profits attributable to each common share as originally reported by the company, but adjusted for all subsequent stock splits and stock dividends; may be based on weighted average shares outstanding (Basic EPS) or weighted average shares including all shares reserved for conversion of convertible securities (Diluted EPS). Annual and quarterly earnings per share figures on the Value Line page exclude nonrecurring or one-time gains and losses, which are noted in the footnotes.

Earnings Per Share (Bank Industries)—net profit after taxes, expressed on a per-share basis as reported by the company. Includes investment securities gains and losses after 1982.

Earnings Per Share Sensitivity to Change in Loss Ratio (Insurance [Property/Casualty] Industry)—the degree to which earnings per share will be affected by a one percentage point change in the insurance company's loss ratio.

Earnings Predictability—a measure of the reliability of an earnings forecast. Predictability is based upon the stability of year-to-year comparisons, with recent years being weighted more heavily than earlier ones. The most reliable forecasts tend to be those with the highest rating (100); the least reliable, the lowest (5). The earnings stability is derived from the standard deviation of percentage changes in quarterly earnings over an eight-year period. Special adjustments are made for comparisons around zero and from plus to minus.

Earnings Surprise—company earnings reports that are significantly better or worse than were forecast.

Equally Weighted Average—a stock price index that gives equal weight to each stock regardless of its price or market capitalization. The Value Line indexes are equally weighted averages.

Equity—ownership interest held by shareholders in a corporation (essentially the same as stock).

Equity Offering—the selling of stock by a corporation.

Ex-Dividend Date—the date by which an investor must have purchased a stock in order to receive announced dividends or stock distributions.

Expense Ratio (Insurance [Property/Casualty] Industry)—see Percent Expense to Premiums Written.

Expense Ratio (REIT Industry)—expenses other than interest, expressed as a percentage of the average assets.

Expenses/Assets (Investment Companies)—operating expenses expressed as a percentage of the investment company's total assets at yearend.

Exports—the sale of goods and services from one country to another. U.S. exports of goods and services are reported by the Commerce Department in its Gross Domestic Product (GDP) reports.

Federal Funds—a market among commercial banks in which banks that need a short-term loan in order to meet regulatory reserve requirements are able to borrow from banks with excess funds. The Federal Funds rate is the interest rate charged on such loans.

Federal Reserve Board—the governing body of the Federal Reserve System, which regulates certain banks and is charged with setting national monetary policy.

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- FHLB Advances** (Thrift Industry)—funds borrowed from the regional Federal Home Loan Bank.
- Financial Strength Rating**—a relative measure of financial strength of the companies reviewed by Value Line. The relative ratings range from A++ (strongest) down to C (weakest), in nine steps.
- Financial Times-Stock Exchange 100 (FT-SE 100)**—a stock price index made up of 100 of the largest stocks traded on the London Stock Exchange. The index is published by The Financial Times, a London-based financial newspaper.
- Finding Cost** (Natural Gas [Diversified] and Petroleum Industries)—the amount of money spent per barrel to increase proved reserves through acquisitions, discovery, or enhanced recovery.
- Fixed-charge Coverage** (Electric Utility Industry)—pretax operating income after depreciation but before other income, interest charges, and Allowance for Funds Used During Construction (AFUDC), divided by long-term plus short-term interest plus twice the preferred dividend. Used as a measure of financial strength for an electric utility. A fixed charge coverage of 100 means that the operating income equals fixed expenses. A figure above 100 means that operating income exceeds fixed expenses, and vice versa.
- Free Cash Flow**—net income plus depreciation minus the total of dividends, capital expenditures, required debt repayments, and any other scheduled cash outlays.
- Full Cost Accounting** (Canadian Energy, Natural Gas Diversified, and Petroleum Industries)—a method of accounting under which all costs related to the exploration and development of oil and gas reserves are immediately expensed (a less conservative method than Successful Efforts Accounting).
- Fully Diluted Earnings Per Share**—earnings per share assuming conversion of all convertible securities plus the exercise of all warrants and options. Similar to Diluted Earnings, which replaced Fully Diluted EPS for all years after December 15, 1997.
- Funds Borrowed** (Bank Industries)—Federal Funds (free reserves borrowed from other banks), securities sold under Repurchase Agreements (“repos”), commercial paper sold by bank holding companies and non bank subsidiaries, and any other non deposit sources of short-term funds.
- GAAP**—abbreviation for the Generally Accepted Accounting Principles used by U.S. companies and determined by the Financial Accounting Standards Board (FASB), a private, industry-sponsored organization.
- General and Administrative Expenses**—expenses such as salaries, rents, advertising, and public relations.
- Geometric Average**—a geometric average is the n th root of the product of n terms. If $n = 3$, the geometric average of the three numbers would be the cube (or third) root of the product of the three numbers.
- Goodwill**—see intangibles.
- Government Securities** (Bank Industries)—fixed-income debt obligations of the U.S. Government and federal agencies.
- Gross Billings** (Advertising Industry)—the aggregate outlays for advertising paid by clients to the media. Billings generally serve as a basis for agency commissions.
- Gross Dividend Declared per ADR** (American Depositary Receipts)—dividends per ADR declared (but not necessarily paid) during the company’s fiscal year before any withholding taxes. For companies based in the United Kingdom, dividends declared are net of the Advance Corporation Tax.
- Gross Equipment** (Air Transport Industry)—the total of all flight equipment, ground stations, and other property, and all equipment (including property under capital lease) at original cost as reported by the airline company. Does not include advance payments for new equipment.
- Gross Income** (Financial Services Industry)—the total of interest on receivables, discounts, commissions, service charges, and other revenues.
- Gross Income** (REIT and Thrift Industries)—all income earned in normal operations excluding nonrecurring items such as gains from property sales.
- Gross Income to Interest Ratio** (Financial Services Industry)—gross income divided by total interest paid.
- Gross Loans** (Bank Industries)—total loans outstanding before deductions for loan-loss reserves and unearned income.
- Gross Margin** – Gross Profit as a % of Sales.
- Gross Portfolio Yield** (Investment Companies)—gross annual income (before any expenses) divided by total assets at yearend, expressed as a percentage.
- Gross Profit** (Industrial and Retail Industries) – The income remaining after subtracting the cost of the goods sold. Gross Profit is income before other expenses such as general, selling, and administrative costs, interest, depreciation, and taxes.
- Growth Stock**—stocks of companies whose earnings grow consistently over time reflecting the fact that such companies have limited sensitivity to the country’s economy as it moves up and down (the opposite of a cyclical stock, which is defined above).

Holding Company—a business that confines its activities to owning stock in and supervising the management of other companies.

Housing Starts—the number of single- and multi-family units for which construction has begun. Published by the Commerce Department.

Imports—a country's purchases of goods or services from other countries. U.S. imports of goods and services are reported by the Commerce Department when it releases the Gross Domestic Product (GDP) report.

Income Dividends Per Share (Investment Companies)—dividends declared from net investment income on a per-share basis.

Income Statement—a financial report that lists revenues, expenses, and net income throughout a given period.

Income Stocks—stocks with higher-than-average dividend yields. (Often, but not always, stocks with dividends that are considered likely to be maintained or raised.)

Income Taxes—the total of all foreign and domestic (federal, state and city) taxes charged against income.

Income Tax Rate—total income taxes as a % of pretax income.

Industrial Production—a Federal Reserve index, published monthly, of the output of the nation's factories, mines, and utilities.

Industry Timeliness Rank—the relative *Timeliness* rank of an industry, updated weekly in the *Summary & Index* and calculated by averaging the *Timeliness* ranks of each of the stocks assigned a *Timeliness* rank in the industry. Industries with high *Timeliness* ranks are those with large percentages of stocks that also have high *Timeliness* ranks. The rank of each industry is listed on the front cover of *Summary & Index*, next to the name of the industry.

Initial Public Offering—a corporation's first equity offering to the public.

Initial Unemployment Insurance Claims—a weekly Labor Department compilation of new unemployment claims based on data from each of the States in the Union and Washington, D.C.

Insider Decisions—the number of decisions to buy or sell a company's shares made by officers and directors and shown by month for a nine-month period. This table is shown on the left side of the price chart on the *Ratings & Reports* page. (The source of this information is Vickers Stock Research Corp.)

Institutional Decisions—the number of decisions reported by investment managers having equity assets under management of \$100 million or more to buy

or sell a company's shares. This table appears on the left side of the price chart on the Value Line page. (The source of this information is Vickers Stock Research Corp.)

Insurance in Force (Insurance Industries)—the aggregate face amount of all life insurance policies outstanding.

Intangibles—assets such as goodwill (the excess of cost over net assets of companies acquired by purchase), patents, trademarks, unamortized debt discounts, and deferred charges. This figure, if it is material, is footnoted on the Value Line page.

Intangibles Per Share—intangible assets divided by the number of common shares at year end.

Interest—payment for the use of borrowed money. Many companies have both interest charges (for long- and short-term funds they have borrowed) and interest income (for money they have invested, usually in short-term, interest-bearing investments).

Interest Cost to Gross Income (Thrift Industry)—interest expenses for the year, expressed as a percentage of gross income.

Inventories—raw materials, work in progress, and finished products. LIFO (last-in, first-out) accounting minimizes illusory, but taxable, inventory profits in periods of rising prices because high-cost materials are expensed against income first. Under FIFO (first-in, first-out) accounting, the reverse is true. Average cost (middle-in, middle-out) is a compromise between LIFO and FIFO.

Inventory Investment—the change in inventories valued at average prices for the period, as published by the Commerce Department in its periodic Gross Domestic Product reports.

Inventory-to-Sales-Ratio—a ratio of inventories to sales, expressed as a percentage. An excessively high ratio may indicate that businesses have too much inventory on hand and are about to cut back production in order to reduce inventories. A decline in production would slow economic growth.

Inventory Turnover—sales divided by year-end inventory. A measure of the efficiency of inventory management.

Investment Company (or Fund)—a company or fund that invests in other companies (usually through the purchase of equity or debt securities) or invests in commodities or real property, etc., or any combination of the above.

Investment Income (Insurance Industry)—dividends, interest, and rents received on investments and any other investment income less the expenses of the investment department.

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- Investment Income Per Share** (Insurance Industry)—dividends, interest, and rents received on investments less the expenses of the investment department, divided by the number of common shares outstanding at year end.
- Large Cap** — a market capitalization (stock price times shares outstanding) of more than \$5 billion.
- Leading Economic Indicators**—a monthly Commerce Department index designed to gauge future economic activity.
- Leases**—contractual rentals of plant and equipment. Must be “capitalized” when most of the benefits and obligations of ownership are transferred to the lessee. Capitalizing leases increases long-term debt and gross plant, and depreciation and interest are charged to profits. Uncapitalized-lease accounting enhances the balance sheet, since the financial obligation is not shown.
- Legends Box**—the box at the top of the Price Chart in each full-page report in *The Value Line Investment Survey*. This box is labeled LEGENDS and includes the specific “Cash Flow” per share multiple that will be plotted on the Price Chart and lists stock splits. It also identifies the “Cash Flow” and Relative Price Strength lines that are plotted on the Price Chart
- Leveraged Buyout**—a corporate takeover, often led by members of management, in which funds are borrowed against company assets in order to pay off existing shareholders. As a result, a publicly held company becomes a highly leveraged, privately held company.
- Life Premium Income** (Insurance Industries)—funds received from policyholders in exchange for promises to make future payments upon (1) death or at a specific date or dates under various forms of life insurance and annuity contracts and/or (2) disability under accident and health contracts.
- Load Factor** (Air Transport Industry)—the percentage of total airline seating capacity that is actually sold and utilized. It is computed by dividing revenue passenger miles flown by available seat miles flown in scheduled service.
- Load Factor** (Electric Utility Industry)—the ratio of the average output in kilowatts supplied during a designated period to the maximum output occurring in that period.
- Loan Loss Experience** (Bank and Thrift Industries)—net loan charge-offs divided by average loans outstanding in a given period.
- Loan Loss Provision** (Bank and Thrift Industries)—funds set aside each quarter in order to cover future possible losses on loans that are not repaid. This figure appears on the bank’s income statement.
- Loan Loss Reserve** (Bank Industries)—reserves set aside at a point in time in order to cover future possible loan losses. This figure appears on the bank’s balance sheet.
- Long-Term Debt**—the portion of borrowings (including bank notes, debentures, and capitalized leases) that will be due not in the current 12 months, but in future operating years.
- Long-Term Interest Earned**—pretax income plus long-term interest expense (including capitalized interest) divided by long-term interest. *See Total Interest Coverage.*
- Market Capitalization (Market Cap)**—the market value of all common shares outstanding for a company, calculated by multiplying the recent price of a stock by the number of common shares outstanding. Large Cap stocks have market values of more than \$5 billion. Mid Cap stocks have market values of from \$1 billion to \$5 billion. Small Cap stocks have market values of less than \$1 billion. (When there are multiple classes of common stock, which often sell at different prices, the number of shares of each class is multiplied by the applicable price.)
- Market-Capitalization Weighted Average**—a stock price index weighted by the value of all shares outstanding for each stock. In such an index, large market capitalization stocks get proportionately more weight than small stocks.
- Median**—the middle value in an ordered series of numbers. As an example, if you ranked a number of stocks in order based on stock price from high to low, the stock price in the middle would be the median.
- Median Price Earnings (P/E) Ratio** (as shown on the top of a Value Line company report)—is the average annual P/E ratio of a stock over the past 10 years, with certain statistical adjustments made for unusually low or high ratios.
- Merchandise Trade Balance**—the difference between U.S. exports of goods and U.S. imports of goods. Published monthly by the Commerce Department.
- Mid Cap** — a market capitalization (stock price times shares outstanding) of from \$1 billion to \$5 billion.
- Money Supply**—Federal Reserve measures of money outstanding. The Federal Reserve is able to influence increases or decreases in the size of the money supply. If money supply grows significantly faster than overall economic growth for an extended period of time, higher rates of inflation often follow. If money supply grows too slowly, economic growth is inhibited.
- NA**—not available; information that was not available when the report went to press.

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- NASDAQ Composite**—a market-capitalization weighted average of approximately 5,000 stocks traded electronically in the NASDAQ market.
- Net Asset Value (Investment Companies)**—the market value of a company's assets less any liabilities divided by the number of shares outstanding.
- Net Income**—see Net Profit.
- Net Interest Income (Bank and Thrift Industries)**—the dollar amount of interest received on loans and other investments, less the dollar amount of interest paid on deposits and other borrowings.
- Net Interest Margin (Bank Industries)**—the difference between interest rates earned (on loans and other earning assets) and interest rates paid (on deposits and other sources of funds) divided by total value of earning assets.
- Net Loan Losses (Bank Industries)**—loans written off during a period net of recoveries on loans previously written off. Also referred to as net loan charge-offs and net loan write-offs.
- Net Profit (or Income)**—a company's total profit before nonrecurring gains or losses, but after all other expenses.
- Net Profit Margin**—net income before nonrecurring gains and losses as a percentage of sales or revenues.
- Net Revenues (Advertising Industry)**—total commissions and fees received by the agency.
- Net Sales**—gross volume less returns, discounts, and allowances.
- Net Working Capital**—working capital less long-term debt, preferred stock at liquidating value, deferred taxes, minority interests, other long-term liabilities, and intangible assets. Occasionally the phrase is used in a less strict sense to mean working capital less long-term debt. See Working Capital.
- Net Worth**—all the assets shown on the balance sheet, including any intangible assets (i.e., goodwill, debt discount, deferred charges) less current liabilities, long-term debt, and all other noncurrent liabilities. In other words, the sum of common plus preferred stockholders' equity. Generally referred to as shareholders' equity.
- New Loan Volume (Thrift Industry)**—the total of loans originated plus loans purchased in a given period by a thrift.
- New York Stock Exchange Composite**—a market-capitalization weighted average of all the common stocks traded on the New York Stock Exchange.
- Nikkei Stock Average**—an index of 225 Japanese stocks. A barometer of the Japanese stock market.
- NMF**—not meaningful. Used when a number or ratio is so large or small that it is not meaningful. For example, a price/earnings ratio of 100 would probably not be meaningful because earnings in a particular period were unusually depressed.
- Non-Financial Domestic Debt**—the sum of U.S. consumer, business, and government borrowings outstanding.
- Non-interest Expense (Bank Industries)**—expenses other than interest and loan loss provisions, such as wages and overhead.
- Non-interest Income (Bank Industries)**—income other than interest income, such as trust fees, other fee income, and gains on securities transactions.
- Non-performing Assets (Bank and Thrift Industries)**—generally includes loans that are not providing, or are not expected to provide, interest income at the contractual rate. Also includes foreclosed properties.
- Nonrecurring Items**—various unusual gains or losses excluded from reported earnings by Value Line analysts in order to reflect income from ongoing operations. Nonrecurring items are footnoted by year on the Value Line page.
- \$100 DJI Grew To (Investment Companies)**—the amount to which a \$100 investment (divided equally) in each of the 30 Dow Jones Industrial Stocks would have grown from year end 1960 (or year in which the company began operations).
- \$100 Net Assets Grew To (Investment Companies)**—the amount to which \$100 invested in the net assets of a closed-end fund would have grown from year-end 1960 (or after the first year of the company's operation), assuming all capital gains distributions had been reinvested in additional shares.
- Operating Earnings**—earnings (profits) left after subtracting the cost of goods sold and marketing, general, and administrative costs from sales. Sometimes referred to as EBITDA (earnings before interest, taxes, depreciation, and amortization).
- Operating Income**—see Operating Earnings.
- Operating Margin**—operating earnings as a percentage of sales.
- Operating Profit**—see Operating Earnings.
- Option**—a contract that gives a buyer the right to buy or sell 100 shares of stock within a certain period of time and at a pre-established price. A call option gives an investor the right to buy 100 shares of stock at a specified price, while a put option allows him to sell 100 shares.
- Output Per Hour (Nonfarm)**—a Labor Department index of what U.S. non-agricultural workers produce, on average, in an hour. An increase in this index over time is an indicator of productivity gains.

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- Par Value**—the nominal or face value of a stock or bond.
- Passenger Yield** (Air Transport Industry)—the average revenue per mile paid by each passenger, computed by dividing passenger revenues by revenue passenger miles.
- Payout Ratio**—see Percent All Dividends to Net-Profit.
- P/E Ratio**—the price of the stock divided by earnings for a 12-month period. See Average Annual Price-Earnings (P/E) Ratio, Current Price-Earnings (P/E) Ratio, Trailing Price-Earnings (P/E) Ratio, and Median Price-Earnings (P/E) Ratio.
- Peak Load** (Electric Utility Industries)—the greatest demand for power during a specified period of time.
- Pension Liability**—the total of all unfunded, vested pension benefits that have been accrued.
- Percent All Dividends to Net Profit**—the sum of all cash dividends (common and preferred) declared, but not necessarily yet paid, for a company's operating or fiscal year, divided by net profit for that year, expressed as a percentage. Also known as the payout ratio.
- Percent Commissions** (Securities Brokerage Industry)—income received for execution of trades in commodities, listed securities, NASDAQ transactions, and sales for mutual fund shares as a percentage of total revenues.
- Percent Common Stocks** (Investment Companies)—the value of common stocks held as a percentage of total assets at year end.
- Percent Earned Common Equity**—net profit less preferred dividends divided by common equity (i.e., net worth less preferred equity at liquidation or redemption value), expressed as a percentage. See Percent Earned Total Capital.
- Percent Earned Shareholders' Equity**—net profit divided by net worth, expressed as a percentage. See Percent Earned Total Capital.
- Percent Earned Net Worth** (REIT Industry)—net profit divided by average net worth for the year, expressed as a percentage.
- Percent Earned Total Assets** (Bank and Thrift Industries)—net profit divided by total reported assets, expressed as a percentage.
- Percent Earned Total Capital**—net profit plus one half the interest charges on long-term debt divided by total capital (i.e., long-term debt plus net worth), expressed as a percentage.
- Percent Earned Total Capital** (REIT Industry)—net profit plus total interest expense (i.e., the sum of short- and long-term interest outlays) divided by the average total capital (i.e., average total debt plus average net worth), expressed as a percentage. Should be compared to Percent Earned Net Worth to determine the impact of leverage (i.e., use of borrowed capital) to enhance the return to stockholders.
- Percent Expense to Premiums Written** (Insurance [Property/Casualty] Industry)—underwriting expense (commissions and general and administrative costs) divided by net premiums written less dividends to policyholders, expressed as a percentage. Also called the Expense Ratio.
- Percent General & Administrative Expense to Gross Income** (Thrift Industry)—expenses such as salaries, rents, and advertising and public relations costs divided by gross income for the year, expressed as a percentage.
- Percent Interest Cost to Gross Income** (Thrift Industry)—interest expenses for the year divided by gross income for the year expressed as a percentage.
- Percent Interest Income** (Securities Brokerage)—interest derived from funds loaned to customers' margin accounts plus interest on government and corporate securities held in the company's account, expressed as a percentage of total revenues.
- Percent Investment Banking** (Securities Brokerage Industry)—fees received for private placements, venture capital financing, real estate activity, mergers and acquisitions, exchange and tender offers, consulting, underwriting, and syndication participation, expressed as a percentage of total revenues.
- Percent Investment Income to Total Investments** (Insurance [Property/Casualty] Industry)—investment income less associated expense divided by total investments, expressed as a percentage.
- Percent Losses to Premiums Earned** (Insurance [Property/Casualty] Industry)—losses and loss expenses divided by premiums earned, expressed as a percentage. Also called the Loss Ratio.
- Percent Price to Book Value** (Insurance Industries)—the average price for the year divided by book value per share, expressed as a percentage.
- Percent Principal Transactions** (Securities Brokerage Industry)—trading and securities transactions for the firm's own account (e.g., block positioning, market making, and government, municipal, and corporate bond trading out of the company's inventory), expressed as a percentage of total revenues.
- Percent Problem Assets to Mortgage Loans**—total assets at year end that are problems.
- Percent Short-Term Debt to Total Debt** (Financial Services Industry)—all debt due in the next 12 months divided by total short-and long-term debt at year-end, expressed as a percentage.

Per Share Basis—total Sales, “Cash Flow,” Earnings, or Dividends, and other data divided by the number of shares outstanding. Earnings and dividends are almost always described on a per share basis for ease of understanding.

Personal Consumption Expenditures—consumer spending reported monthly by the Commerce Department. Also included in the Gross Domestic Product (GDP) reports.

Personal Income—consumer income reported monthly by the Commerce Department. Also included in the Gross Domestic Product (GDP) reports.

Plant Age—an estimate derived by dividing accumulated depreciation at the most recent year end by the depreciation allowance in the most recent year.

Plowback Ratio—see *Retained to Common Equity*.

Policyholders’ Dividends (Life Insurance Industries)—refunds to the policyholder of part of the premium paid on participation life insurance policies, reflecting the difference between the premium charged and actual mortality experience.

Policyholders’ Surplus (Life Insurance Industries)—book value as determined using statutory accounting techniques. Statutory accounting, unlike generally accepted accounting principles (GAAP), does not permit deferral of policy acquisition costs.

Preference Stock—see Preferred Stock.

Preferred Stock—a security that represents an ownership interest in a corporation and gives its owner a prior claim over common stockholders with regard to dividend payments and any distribution of assets should the firm be liquidated. Preferred stock normally is entitled to dividend payments at a specified rate. These dividends must be paid in full before the payment of a common stock dividend. May or may not have seniority over preference stock (which is akin to preferred stock), depending on state regulations.

Preferred Stock Ratio—preferred stock at liquidation or redemption value divided by total capital (i.e., the sum of long-term debt, preferred equity, and common equity), expressed as a percentage.

Premium Income Per Share (Insurance Industries)—income to the insurance company consisting of payments made by life, accident and health, disability, and property/casualty insurance policyholders as provided for under the terms of their insurance contracts, divided by the number of common shares outstanding.

Premium Over Book (REIT Industry)—the percentage by which the average annual stock price exceeds the average annual book value per share. If the stock sells

at a discount from book value, the percentage of that year is preceded by a minus sign.

Premium Over Net Asset Value (Investment Companies)—see *Discount From Net Asset Value*.

Premium Written to Surplus (Insurance [Property Casualty] Industry)—the total premium received for policies sold during the year divided by legally defined net worth.

Premiums Earned (Insurance Industry)—premiums received in advance for insurance protection that will remain in force for a year or more. Premiums accrue to revenues (i.e., are earned) only in proportion to the actual time elapsed under the policy relative to the entire policy term.

Premiums Written Per Share (Insurance [Property/Casualty] Industry)—the total premiums received from property/casualty insurance policyholders for policies sold during the year divided by the number of common shares outstanding.

Present Value—the amount that, if paid today, would be the equivalent of a future payment, or series of future payments, under specified investment assumptions. If, for example, funds can be invested today to yield 10% annually, a payment of \$100 to be made one year hence has a present value of \$90.91; that is, \$100 divided by 1.10.

Pretax Corporate Profits—see *Corporate Profits*

Pretax Margin—profits before federal, state, and foreign income taxes as a percentage of sales or revenues.

Price Chart—a graphic historical presentation of the movement of a stock and, often, additional information. The price chart that appears on each Value Line page includes monthly stock price ranges (small vertical lines), a cash flow line (a solid line with projections shown as dashes), and a relative-strength price line (a series of dots).

Price Earnings Ratio—Probably the most widely used measure of stock valuation. Value Line shows a variety of P/E ratios on every company page, as discussed below:

The P/E ratio on the very top of the Value Line page (item 6 on page 21). This is calculated by dividing the recent price of the stock by the total of the last six months earnings and the next six months of estimated earnings.

The Relative P/E ratio. This compares the P/E of one stock with the median of estimated P/E ratios of all stocks under Value Line review. A relative P/E of more than 1 indicates that a stock’s P/E ratio is currently higher than that of the Value Line universe; a P/E of less than 1 indicates that this stock’s P/E is less than the Value Line average.

A *Trailing P/E ratio*. This is calculated by dividing the recent price of the stock by the past 12 months of actual (reported) earnings. This is the figure shown in most newspapers.

A *Median P/E ratio*. This is the average annual P/E ratio of a stock over the past 10 years, with certain statistical adjustments made for unusually low or high ratios.

The *Average Annual P/E ratio*. This is calculated by dividing the average price for a year with the actual reported earnings for that year and is shown in the Statistical Array.

The *Average Relative Annual P/E ratio*. This is calculated by dividing the average annual P/E of a stock with the average annual P/E of all stocks under Value Line review.

Price Growth Persistence—a measurement of the historic tendency of a stock to show persistent price growth compared to the average stock. Value Line Persistence ratings range from 100 (highest) to 5 (lowest).

Price-Weighted Average—a stock price average that gives proportionately more weight to stocks with high share prices than it does to stocks with low prices. The Dow Jones Averages are price-weighted.

Primary Earnings Per Share—earnings per share calculated on the assumption of the conversion of certain senior securities (those of the company deemed, according to an accounting formula, to be common stock equivalents—that is, likely to trade like common shares) into common stock. This calculation has not been used since 1997.

Prime Rate—the base lending rate reported by the largest commercial banks in the nation.

Problem Assets (Thrift Industry)—delinquent loans, loans past due 90 days or more, and foreclosed real estate.

Producer Price Index (PPI)—Labor Department price indexes of goods categorized by industry and by stage of processing. Widely watched among them are the raw materials, intermediate goods, and finished goods indexes. A measure of inflation.

Projections Box—a box appearing in the upper left corner of a Value Line stock page. It includes the absolute price gain expected for the next 3 to 5 years as well as the compound annual return (appreciation plus dividends) during the same period.

Proved Reserves (Petroleum and Natural Gas /Diversified Industries)—quantities of natural resources that engineering estimates indicate with reasonable certainty are economically recoverable using present technology.

Quarterly Earnings—box appearing at the lower left hand

corner of *The Value Line Investment Survey* page (directly below the quarterly sales box) in which five years of actual and estimated earnings are listed for each of the four quarters of each listed year.

Quarterly Sales—box appearing at the lower left hand corner of *The Value Line Investment Survey* page in which five years of actual and estimated sales are listed for each of the four quarters of each listed year.

Rate Base (Electric Utility Industry)—usually the net original cost of plant and equipment; in some instances including an allowance for cash, working capital, materials, and supplies.

Real—in the context of economic activity, a measure that excludes the effects of inflation. Real Gross National Product, for example, is a measure of the nation's output of goods and services, adjusted for inflation.

Real Estate Investment Trust (REIT)—a financial intermediary that invests its equity capital and debt in income-producing real estate and mortgages. Under legislation passed in 1961, REITs were granted conduit tax treatment (the same as that permitted mutual funds) under which the part of earnings which flows through to shareholders in the form of dividends is exempt from Federal income taxes at the trust (or corporate) level, provided several conditions are met. Among the conditions for qualification as a REIT under the Internal Revenue Code: At least 95% of otherwise taxable income must be distributed to shareholders in the calendar year earned, and specified percentages of both investments and gross income must be related to real estate.

Realized Gain or Loss—profit or loss on the sale of an asset.

Receivables—the value of goods and services sold and shipped to customers, for which the company has yet to be paid.

Receivables (Financial Services Industry)—the amount of money owed to finance companies by customers at year-end, net of unearned discount (the charges to the borrower) and loss reserves.

Relative Price-Earnings (P/E) Ratio—the stock's current P/E divided by the median P/E for all stocks under Value Line review. (*See also Price Earnings Ratio.*)

Relative Strength Price Line—a representation shown in the price chart on each Value Line page as a series of dots. The line compares the price of a stock with the price of an index (in this case the Value Line Arithmetic Composite) over time. When the line is rising, the stock is acting better than the broad index. When it is falling, the stock is acting worse than the index.

Reserve Life (Natural Gas [Diversified] and Petroleum Industries)—a company's reserves of oil, gas, or other natural resources divided by annual production.

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- Reserve Replacement Ratio** (Natural Gas and Petroleum Industries)—the ratio of reserve additions to production. Reserve replacement is calculated by summing the total reserves added over a five-year period. The ratio is calculated by dividing replacement by production over the same period.
- Retail Sales**—a monthly measure of all U.S. retail activity, published by the Commerce Department.
- Retained Earnings**—net profit for the year, less all common and preferred dividends, when relating to the income account. With respect to the balance sheet or common equity, it is the sum of net profit in all years of the company's existence less all dividends (common and preferred) ever paid. In this case, also known as earnings retained or earned surplus.
- Retained to Common Equity**—net profit less all common and preferred dividends divided by common equity including intangible assets, expressed as a percentage. Also known as the Plowback Ratio.
- Return on Shareholders' Equity**—annual net profit divided by year-end shareholders' equity
- Return on Total Capital**—annual net profit plus 1/2 of annual long-term interest divided by the total of shareholders' equity and long-term debt
- Revenue**—see Sales.
- Revenue Passenger Miles** (Air Transport Industry)—a measure of airline traffic. Each revenue passenger mile represents one revenue-paying passenger flown one mile.
- Revenues** (Banks)—this figure has not been used by most banks in the past. However, the combination of net interest income and non-interest income will provide investors with a close approximation.
- Revenues** (Electric Utility, Natural Gas [Distribution], Telecommunications Industries)—the amounts billed for services rendered.
- Revenues** (Real Estate Industry)—the total of rental, construction, and interest income and property sales.
- Revenues Per Share**—gross revenues for the year divided by the number of common shares outstanding at year end.
- Safety Rank**—a measurement of potential risk associated with individual common stocks. The Safety Rank is computed by averaging two other Value Line indexes—the Price Stability Index and the Financial Strength Rating. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit their purchases to equities ranked 1 (Highest) and 2 (Above Average) for Safety.
- Sales**—gross volume less returns, discounts, and allowances; net sales.
- Sales Per Share**—net sales divided by the number of common shares outstanding at year-end.
- Savings Deposits Per Share** (Thrift Industry)—total savings deposits at year-end divided by the number of common shares outstanding at yearend.
- Savings Rate**—the personal savings rate, expressed as a percentage of consumer income, published monthly by the Commerce Department.
- Seasonally Adjusted**—a statistical method of adjusting economic data for seasonal differences in economic activity. For example, monthly retail sales are adjusted for the surge of buying that takes place during the end-of-year holiday season.
- Shareholders' Equity**—a balance sheet item showing a company's net worth. Represents the sum of common and preferred equity including redeemable preferred. Also includes intangibles.
- Short-Term Debt**—all debt due in the next 12 months and, therefore, considered a current liability. Same as Debt Due. See Total Debt.
- Small Cap**—a market capitalization (stock price times shares outstanding) of less than \$1 billion.
- Spot Market**—a market in which commodities are purchased or sold and delivered quickly, that is, on the spot.
- Standard Deviation**—a statistical measure of volatility.
- Standard & Poor's 500**—a market-capitalization weighted index of 500 large U.S. common stocks.
- Statistical Array**—the large statistical section in the center of each Value Line company report in *Ratings & Reports*. The section contains up to 17 columns of historical information and three columns of estimates on 23 different data items.
- Statutory Insurance Accounting** (Insurance Industries)—the accounting method required for insurance companies reporting to state insurance regulatory authorities. It is a cash bookkeeping technique, rather than the usual method used in business.
- Stock (Common)**—units of ownership of a public corporation.
- Stock Dividend**—the issuance of additional common shares to common stockholders, with no change in total common equity. From an accounting standpoint, retained earnings (i.e., the earned surplus) are reduced and the value of the reported common stock component of common equity (usually called the "par value" account) is increased. (The reduced level of retained earnings is important since bond indentures limit dividend payouts by stipulating minimum levels of retained earnings.) See Stock Split.

Stock (Preferred)—a class of stock that generally has preference over common stock in the payment of dividends and the liquidation of assets and normally pays dividends at a specified rate.

Stock's Price Stability—a relative ranking of the standard deviation of weekly percent changes in the price of a stock over the past five years. The ranks go from 100 for the most stable to 5 for the least stable.

Stock Split—an increase in the number of common shares outstanding by a fixed ratio, say 2-to-1 or 3-to-1, with proportionate allocation of underlying common equity (i.e., the sum of common stock, capital surplus, and retained earnings) and earnings to the increased number of shares outstanding. Total common equity remains the same. From an accounting standpoint, the mix of retained earnings, capital surplus, and common stock remains unchanged. See Stock Dividend. When there is a stock split or dividend, **all historical per-share numbers (including past share prices) are adjusted to reflect the new shares outstanding.** If, for example, a company's stock traded in a range of 40 to 60 last year and it reported earnings of \$2.00 per share, after adjustment for a 2-for-1 stock split, the price range for last year would be 20 to 30 and earnings would be \$1.00 a share.

Successful Efforts Accounting (Canadian Energy, Natural Gas [Diversified], and Petroleum Industries)—a method of accounting under which exploratory wells found to be dry are expensed as incurred. See Full Cost Accounting.

Supplementary Report—an update of a regular full-page Value Line company report published in the back of the *Ratings & Reports* section when there is a significant development relating to a company. Among the most likely reasons for a Supplementary Report are a major corporate development, such as a merger or acquisition, an unexpectedly good or poor earnings announcement, a change in the sales or earnings outlook, an increase or decrease in the *Timeliness* rank.

Surplus (Insurance Industries)—the amount by which assets exceed liabilities on a legally defined accounting basis.

Target Price Range—the projected average annual price range three to five years hence, based on Value Line earnings and P/E Ratio forecasts. The midpoint of the range is our estimate of the average annual price three to five years from now. The percentage appreciation potential and the estimated annual total return are computed from the projected low and high prices three to five years hence.

Technical Rank—Value Line's proprietary ranking of estimated stock price performance relative to the overall market in the next three to six months, based on a complex analysis of the stock's relative price performance during the previous 52 weeks. Unlike the Timeliness Rank, earnings are not a factor in the Technical Rank. Stocks ranked 1 (Highest) and 2 (Above Average) are likely to outpace the market during the next quarter or two. Those ranked 4 (Below Average) and 5 (Lowest) are expected to underperform most stocks. Stocks ranked 3 (Average) will probably advance or decline with the market. The Technical Rank is purely a function of relative price action and is primarily a predictor of relative short-term price movements. (It may thus be particularly useful in trading short-term instruments such as stock options.) Investors should try to limit purchases to stocks with Technical Ranks of 1 (Highest) and 2 (Average). Under no circumstances, however, should the Technical Rank replace the Timeliness Rank as the primary tool in making an investment decision. Over the years, the Timeliness Rank has had a superior record.

Tender Offer—a way of taking over a company by offering shareholders a fixed (or variable) price for all outstanding stock. If enough shareholders decide to sell, the company can be taken over.

3- to 5-Year Projections—a potential average high and low stock prices Value Line forecasts for a period 3 to 5 years in the future.

Thrift—a financial institution deriving its funds primarily from consumer savings accounts.

Ticker Symbol—the abbreviation of the company's name by which a security is identified for purposes of trading. Also called *Stock Symbol*.

Time Deposits—interest-bearing deposits that a financial institution may require to remain on deposit for a specified period of time. Also called certificates of deposit.

Timeliness Rank—the rank of a stock's probable relative market performance in the year ahead. It is derived via a computer program using as input the long-term price and earnings history, recent price and earnings momentum, and earnings surprise. All data are known and actual. Stocks ranked 1 (Highest) and 2 (Above Average) are likely to outpace the year-ahead market. Those ranked 4 (Below Average) and 5 (Lowest) are expected to underperform most stocks over the next 12 months. Stocks ranked 3 (Average) will probably advance or decline with the market in the year ahead.

Investors should try to limit purchases to stocks ranked 1 (Highest) and 2 (Above Average) for *Timeliness*.

Timely Industries—see *Industry Timeliness*.

Timely Stocks—those ranked 1 or 2 for *Timeliness*. These are the stocks Value Line thinks will perform better than the Value Line universe as a whole in the coming six to 12 months.

Top Line—a reference to sales, which are usually shown on the top line of an income statement.

Total Capital—the sum of long-term debt, preferred stock at liquidation or redemption value, and common equity including intangibles.

Total Debt—the sum of long-term debt shown in the Capital Structure box and debt due displayed in the Current Position box.

Total Debt Due in 5 Years—the sum of bank notes due in 12 months (or less) and all long-term debt maturing within the next five years (including that portion of long-term debt due in the current operating year). See also Debt Due.

Total Distributions (Investment Companies)—total payments (capital gains plus dividends) made to shareholders of a fund.

Total Interest Coverage—pretax income plus total interest expense (including capitalized interest) divided by total interest expense.

Total Return (%)—the sum of the total appreciation (or depreciation) of a stock over a given period plus any cash dividends received during the same period divided by the price of the stock at the beginning of the period. Each Value Line page shows the total cumulative returns (if available) for the past 1, 3, and 5 years. Each page also denotes the total returns for the Value Line Arithmetic Index for the same periods for comparative purposes. (For more, see Value Line Arithmetic Composite Index)

Total Revenues (Securities Brokerage Industry)—gross revenue from all sources, including commissions, investment banking fees, principal transactions, and interest income (generally without deduction for interest expense) derived from funds loaned to customers' margin accounts plus interest on securities held in the company's account.

Trailing Price Earnings (P/E) Ratio—the recent price of the stock divided by the sum of earnings per share reported during the last 12 months.

Translation Rate (Foreign Stocks)—the exchange rate at which financial data are converted into dollars. Historical data are translated at the exchange rate on the last day of the fiscal year. In the case of quarterly data for the

current fiscal year and all estimates, the translation rate is the estimated exchange rate at fiscal year end.

Treasury Stock—common stock issued and then reacquired by the issuing firm. Such reacquisitions result in a reduction of stockholders' equity.

Unconsolidated Income—aftertax earnings of partially or wholly owned subsidiaries whose financial results are not included in the pretax financial results or income taxes reported.

Underwriting Income Per Share (Insurance [Property/Casualty] Industry)—underwriting profit divided by the number of common shares outstanding at year-end.

Underwriting Margin (Insurance Industries)—the difference between 100% and the sum of the loss and expense ratios in property/casualty underwriting. It may be either positive (indicating an underwriting profit) or negative (indicating an underwriting loss).

Unemployment Rate—a Labor Department measure of the ratio of the number of unemployed in the labor force, expressed as a percentage. The Civilian Unemployment Rate is based on a work force that excludes U.S.-stationed members of the armed forces. The National (or Total) Unemployment Rate is based on a work force that includes U.S.-stationed members of the armed forces.

Unit Labor Costs (Nonfarm)—a Labor Department index based on the ratio of the Compensation Per Hour Index (Nonfarm) and the Output Per Hour Index (Nonfarm). Unit labor costs are useful because they illustrate how productivity gains offset rising wages, or how wage increases outstrip productivity gains.

Unrealized Appreciation (or Depreciation)—the dollar amount by which the market value of a holding exceeds (or falls below) its cost.

Untimely Stocks—those ranked 4 or 5 for *Timeliness*. These are stocks Value Line thinks will perform less well than the market in the coming six to 12 months.

Upstream—see Downstream.

Value Line Arithmetic Composite Index—an equally weighted price index of all stocks covered in *The Value Line Investment Survey*. Arithmetic refers to the averaging technique used to compute the average. See Arithmetic Average.

Value Line Geometric Composite Index—an equally weighted price index of all stocks covered in *The Value Line Investment Survey*. Geometric refers to the averaging technique used to compute the average. See Geometric Average.

Value Line Geometric Industrial Index—an equally weighted price index of all stocks in *The Value Line Investment Survey*, except for utilities and rails. Geo-

metric refers to the averaging technique used to compute the average. See Geometric Average.

Value Line Geometric Rails Index—an equally weighted price index of railroad stocks reviewed in *The Value Line Investment Survey*. Geometric refers to the averaging technique used to compute the average. See Geometric Average.

Value Line Geometric Utilities Index—an equally weighted price index of utility stocks reviewed in *The Value Line Investment Survey*. Geometric refers to the averaging technique used to compute the average. See Geometric Average.

Warrant—an option to buy a security, usually a common stock, at a set price (exercise price) over an established number of years. A warrant has no claim on either the equity or the profits of a company.

Working Capital—current assets less current liabilities. See also Current Assets, Current Liabilities, and Net Working Capital.

Writedown—a company's recognition of a reduction in value of an asset. The decline in value is charged against income in the period that the writedown is taken.

Yield (for stocks)—the estimated dividends for the next 12 months divided by the current price, expressed as a percentage.

Yield-Cost Margin (Thrift Industry)—the difference between interest rates earned (on loans and other earning assets) and interest rates paid (on deposits and other sources of funds).

Yield Curve—a measure of the relationship between short-and long-term interest rates. Often the yields on three-month Treasury bills and 30-year Treasury bonds are compared. The yield curve is said to be positive when long-term rates are higher than short-term rates. When short-term and long-term rates are about equal, the yield curve is said to be flat. The yield curve is said to be inverted when short-term rates are higher than long-term rates.



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REQUEST:

Refer to the Nowak Direct Testimony, page 37 and Attachment JCN-6: CAPM 2.

a. Explain why it is not inconsistent to use a Value Line Beat value, which is based upon the broader New York Stock Exchange Composite Index, and a market risk premium based on the much narrower S&P 500 market.

b. Explain what the market risk premium would be if the broader New York Stock Exchange Composite Index were used as the market proxy and provide an update to the CAPM analyses using the New York Stock Exchange Composite Index with the Value Line Beta values.

c. For rate making purposes for state regulated electric utilities, explain why the FERC method of limiting growth rates to between 0 and 20 percent is reasonable.

RESPONSE:

a. As shown on pages 34 and 35 of Nowak’s Direct Testimony, both equation [3] (the CAPM formula) and equation [4] (the Beta coefficient formula) require an estimate of the required market return as a whole. The return on market indices (i.e., the S&P 500 and the New York Stock Exchange Composite Index) are used as a proxy for “the return on the market as whole.” To the extent that the Market Risk Premium and Beta coefficient apply different market indices in their respective estimates of the overall market return, as long as the individual estimates are both measures of the overall market and there is no bias between the two estimates, there is no fundamental inconsistency. Further, over the

five-year analytical period incorporated in Value Line's Beta estimates on which Mr. Nowak relies, weekly returns on the S&P 500 and the New York Stock Exchange Composite Index were highly correlated. Therefore, it is unlikely for any significant difference in Beta coefficients estimated based on the S&P 500 versus the New York Stock Exchange Composite Index.

b. Mr. Nowak does not have the data required to estimate the market risk premium for broader New York Stock Exchange Composite Index consistent with the date of his cost of equity analyses and therefore has not performed the requested calculations.

c. The FERC method of calculating the market return is intended to estimate the same input to the CAPM that Mr. Nowak is estimating in his CAPM approach – the required return for the market as a whole. As such, there is no basis for a distinction for applicability to state regulated electric utilities versus FERC-regulated electric utilities. Regardless of the jurisdiction, the same analytical principles apply. Therefore, the FERC methodology, while conservative, is reasonable.

PERSON RESPONSIBLE: Joshua C. Nowak

REQUEST:

Refer to the Nowak Direct Testimony, page 39, lines 1–5 and page 40, Figure 8. The figure appears to show a downward trend, and a fairly wide variance in the data points, and the R² coefficient is only 0.82. For rate making purposes, explain the validity of using historical authorized returns for vertically integrated electric utilities relative to 30-year Treasuries for Return on Equity (ROE) analyses.

RESPONSE:

Mr. Nowak does not agree with the characterization that Figure 8 “appears to show a downward trend.” Figure 8 demonstrates the relationship between the yield on 30-year Treasury yields and the corresponding risk premium as derived from authorized ROEs for electric utilities. The relationship is not a trend, but rather demonstrates the inverse relationship between interest rates and the risk premium.

In addition, Mr. Nowak disagrees with the characterization that there is a “fairly wide variance in the data points” as well as the implication that an R² value of 0.82 is low. An R² value of 0.82 suggested that 82 percent of variability in the risk premium is explained by interest rates, which is substantial. That indicates that the vast majority of variability in the risk premium is explained by interest rates, and only 18 percent is explained by other factors. Further, the statistical output included in Attachment JCN-7 from the regression analysis between interest rates and the risk premium demonstrates that the relationship is highly statistically significant. The t-statistic of negative 24.03 suggests that the

relationship between interest rates and the risk premium is significant at the 99.99 percent confidence interval.

Further, the analysis is not measuring the relationship between historical authorized returns for vertically integrated electric utilities and 30-year Treasury yields, but rather the relationship the risk premium for vertically integrated electric utilities and 30-year Treasury yield. There is a large body of research in addition to Mr. Nowak's statistical analyses that supports the inverse relationship between interest rates and equity risk premia, including the March 1998 article "Interest Rate Risk and Utility Risk Premia during 1982-93" published by Dr. S. Keith Berry and included as STAFF-DR-02-028 Attachment, which came to similar conclusions regarding the inverse relationship between interest rates and the risk premia. Given the well documented and statistically significant relationship between interest rates and risk premia, the Bond Yield Plus Risk Premium analysis is valid method for estimating the cost of equity.

PERSON RESPONSIBLE: Joshua C. Nowak

Interest Rate Risk and Utility Risk Premia During 1982-93

Keith Berry S

Managerial and Decision Economics (1986-1998); Mar 1998; 19, 2; ABI/INFORM Global
pg. 127

MANAGERIAL AND DECISION ECONOMICS
Manag. Decis. Econ 19: 127-135 (1998)

Interest Rate Risk and Utility Risk Premia During 1982-93

S. Keith Berry*

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INTRODUCTION

The risk premium method of calculating a fair return on equity for a regulated utility is frequently used in regulatory proceedings. That method considers the relationship between a utility's bond yield and its required return on equity, and is especially useful when other methods, such as the capital asset pricing model and the discounted cash flow (DCF) model exhibit less reliability.¹ Although the discounted cash flow method is the favored method for estimating a utility's cost of equity in rate proceedings, the risk premium method provides a useful check on the DCF results. This is even more important in today's financial environment because of the difficulty of measuring investor-expected growth rates in the DCF method.

If bond yields and required returns on equity move up and down in lockstep, it is straightforward to calculate the appropriate cost of equity using the risk premium method. However, if they do not, estimation of the cost of equity is much more difficult. One explanation of this variability in risk premia is differences in 'interest rate risk'. In particular, arguments have been made in rate cases that utility bonds are riskier in the 1980s than they were earlier because of the significant increase in interest rate variability that occurred in the early 1980s (primarily caused by increased inflation rate variability).² In particular, when capital costs, and interest rates, increase, utility bondholders, who earlier 'locked-in' at lower interest rates, miss out on those higher interest rates. Bondholders who experience this will then

prospectively require an 'interest rate risk' premium, and utility bond interest rates will be correspondingly greater. Furthermore, utility bonds of differing overall risk may exhibit differing sensitivities to that 'interest rate risk'.

In contrast, the argument goes, utility common stock returns have some protection from that risk. If capital costs increase, utilities can request a rate increase to increase the allowed return. Consequently, utility common shareholders can earn the higher capital costs, and do not necessarily require an 'interest rate risk' premium.³ Thus, over time we would not necessarily expect to see utility bond yields and required equity returns move in one-to-one lockstep. Furthermore, to the extent that there is some substitutability between utility common stocks and utility bonds as interest rate risk associated with bonds increases, investors may increase their preferences for utility stocks. This should tend to decrease required returns on utility common stock.

Berry (1995) performed an analysis of the impact of interest rate (and capital cost) risk on interest rates and dividend yields. Those results indicate that interest rates are positively related to interest rate variability, but dividend yields are not affected by dividend yield variability. However, that study focused on *dividend yields*, which are easy to measure, and did not consider required equity returns which are much more difficult to measure. Furthermore, that study did not focus on risk premia, and the relationship between bond yields and required returns on equity, as does this paper. This paper utilizes required returns, as measured by Commission-allowed returns, in the risk premium analysis.

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Other studies have shown that there is an inverse relationship between interest rates and risk premia in recent years, but not in earlier years. Carleton *et al.* (1983) found that there was no relationship between electric utility risk premia and interest rates during the 1970s. Brigham *et al.* (1985) estimated a positive relationship between risk premia and interest rates for the 1966–79 period and a negative relationship between the variables during the 1980–84 period. They attributed this to increased inflation risk and its effect on interest rates. Similarly, Harris (1986) showed that there was a negative relationship between utility risk premia and interest rates during the 1982–84 period. Harris and Marston (1992) concluded that there was a negative relationship between the S&P 500 risk premia and interest rates for the 1982–91 period. However, none of these studies used Commission-allowed returns in the calculations of risk premia.

This paper considers two factors not previously considered in the literature. First, allowed returns are used as a proxy for required returns on equity, with appropriate consideration for partial adjustment. Second, explicit usage is made of measures of interest rate risk to gauge their impact on risk premia. Regression analyses is employed to estimate the effects of utility bond yields, interest rate variability, and time trends on required returns on equity and risk premia over the period 1982–93. In the second section, we present a simple regression model, which tests for an inverse relationship between required returns on equity and interest rates. This model, while not very sophisticated, has the inherent advantage that it can be easily used to estimate risk premia. In the third section, we consider a more complex model which explicitly considers various measures of interest rate variability, as well as interest rate levels.

REGRESSION RESULTS WITH INTEREST RATES

A common formulation of the risk premium is:

$$K = YD + RP \quad (1)$$

where K is the required return on common equity, YD is the utility's current cost of long-term debt (yield) and RP is the risk premium. Since YD is directly measurable, and if RP can be properly measured, K can then be directly estimated.⁴

However, there are two general problems with the implementation of a risk premium methodology:

1. The estimation of RP is often based on historical earned returns, which may or may not be indicative of *required* returns; and
2. The level of RP may not be constant through time. In particular, there may be an inverse relationship between interest rates and risk premia.⁵

To address the first problem we use Commission-allowed returns as a reasonable surrogate for required returns, with a partial adjustment feature, as will be discussed later. Commissions and their staff spend a significant amount of time in rate cases considering the determination of a utility's appropriate return on equity. As discussed earlier, the primary method employed is the DCF method, which, when performed properly, estimates the required return on equity.⁶ Furthermore, Commission-allowed returns may represent better estimates of equity costs, than DCF methods using analysts' forecasts, since Commissions comprehend a wide variety of cost of capital methods.

For illustration we have arrayed risk premia by year in Table 1. For comparative purposes we also show the estimated risk premia using the long-term US Treasury bond yield. Note that there is a general upward trend in risk premia associated with Moody's utility bond yields, which occurs during a period of generally decreasing interest rates. Furthermore, the estimated risk premia are less than those reported in Harris and Marston (1992). This can be attributed to two factors. First, utilities are generally less risky than the S&P 500 which were used in the Harris and Marston study, with corresponding lower required returns. Second, Commission-allowed returns may incorporate lower DCF growth rates than the analysts' forecasts used by Harris and Marston.

Finally, risk premia for Treasury bonds, shown in Table 1, appear to be fairly stable, albeit with a slight upward drift over the 1982–93 period. Moody's yields fell by much more (777 basis points) over that period, than did Treasury yields (578 points). An explanation for this is provided in Berry (1995). As shown there, although there is a close one-to-one relationship between Moody's utility bond yields and Treasury yields, interest rate risk had a significant impact on Moody's

Table 1. Equity Risk Premia

Year (1)	US Treasury Bond Yields (2) (%)	Allowed Return on Equity (3) (%)	Equity Risk Premia on Treasury Yields [(3)-(2)] (4) (%)	Moody's Utility Bond Yields (5) (%)	Equity Risk Premia on Moody's Yields [(3)-(5)] (6) (%)
1982	12.23	15.46	3.23	15.33	0.13
1983	10.84	15.18	4.34	13.31	1.87
1984	11.99	15.25	3.26	14.03	1.22
1985	10.75	14.38	3.63	12.29	2.09
1986	8.14	13.2	5.06	9.46	3.74
1987	8.64	12.86	4.22	9.98	2.88
1988	8.98	12.82	3.84	10.45	2.37
1989	8.58	12.92	4.34	10.66	3.26
1990	8.74	12.63	3.89	9.76	2.87
1991	8.16	12.41	4.25	9.21	3.20
1992	7.52	11.84	4.32	8.57	3.27
1993	6.45	11.54	5.09	7.56	3.98
Change 1982-93	-5.78	-3.92	+1.86	-7.77	+3.85

Note: 1993 data are partial year.

yields. The decrease in interest rate risk during the 1980s, consequently, caused an incremental decrease in Moody's yields, in excess of that corresponding to the decrease in Treasury yields.⁷ As will be discussed later, although the risk premia associated with Treasury bonds appear to be fairly stable during the 1982-93 period, there are specific reasons for that, which will not necessarily be repeated in the future.

In our regression analysis we use allowed returns and the corresponding bond yields for that utility's Moody's bond rating from 6 months earlier than the date of the Commission rate order.⁸ This provides a better matching since the evidentiary record on the required return on equity is usually developed some months before the date of the rate order. The data on allowed returns was obtained from various editions of *Public Utilities Fortnightly* (1983-93).⁹ The data on Moody's bond yields was obtained from various editions of *Moody's Public Utility Manual* (1982-93). This yielded a total of 1226 rate case observations over the period 1982-93. For each month we averaged the cross-sectional data to obtain 130 usable time series observations.¹⁰

Consistent with Equation (1), let K_t^* represent the required return on equity at time t such that

$$K_t^* = RP_t + YD_t \quad (2)$$

where RP_t and YD_t are the risk premium and current cost of debt at time t , respectively. To allow for a varying risk premium set

$$RP_t = \alpha + \beta YD_t \quad (2a)$$

Postulate a regulator adjustment function of the form:

$$K_t - K_{t-1} = \gamma(K_t^* - K_{t-1}), \quad 0 < \gamma < 1 \quad (3)$$

where K_t is the allowed return at time t and γ is the adjustment factor. This equation implies an inertia on the part of regulators such that with a change in the required return on equity from the prior period's allowed return on equity, $K_t^* - K_{t-1}$, the regulator only moves part way to a new allowed return. The greater the value of γ , the greater the degree of regulator adjustment.¹¹

Substitution of Equation (2) into Equation (3) yields

$$K_t = \gamma RP_t + \gamma YD_t + (1 - \gamma)K_{t-1} \quad (4)$$

or

$$K_t = \alpha\gamma + (1 + \beta)\gamma YD_t + (1 - \gamma)K_{t-1} \quad (4a)$$

For purposes here, we used the allowed return from 1 month earlier. Regulators are aware of recent allowed returns and will likely partially base their current allowed return awards on those recent historical allowed returns, consistent with Equation (3).¹² We then performed an ordinary least squares regression of the allowed returns on the corresponding bond yields and lagged allowed returns. This resulted in the following regression equation:

$$K_t = 0.03337 + \underset{(6.11)}{0.22301 YD} + \underset{(8.58)}{0.56788 K_{t-1}},$$

(Durbin-Watson = 2.41, $R^2 = 0.905$). (5)

The t -statistics are shown in parentheses, and indicate significance for both independent variables at the 1% level. The implied value of γ , the adjustment factor, is $1 - 0.56788 = 0.43212$.

The implied risk premium equation, corresponding to Equation (2a), is

$$RP_t = 0.07722 - 0.48392 YD_t. \quad (6)$$

Equation (6) indicates the presence of an inverse relationship between risk premia and interest rates. For every 100 basis point drop in interest rates, the risk premium *increases* by approximately 48 basis points and the cost of equity decreases by approximately 52 basis points. Conversely, for every 100 basis point increase in interest rates, the risk premium *decreases* by approximately 48 basis points and the cost of equity increases by approximately 52 basis points.

To the extent interest rate variability is a major factor in the level of capital costs, we would expect to empirically observe this inverse relationship between risk premia and interest rates.¹³ That is, as interest rate variability increases, interest rate risk increases, interest rates increase, and risk premia fall since utility equity costs change very little, or decrease, for the reasons mentioned in the introduction. The converse would be true in the case of a decrease in interest rate variability.¹⁴

An alternative formulation of Equation (1) is

$$K_t^* = RP_t + GOV_t. \quad (7)$$

where GOV_t is the yield on long-term US Treasury bonds and RP_t is the corresponding risk premium. Performing a similar regression analysis with GOV instead of YD produces:

$$K_t^* = 0.1981 + \underset{(3.74)}{0.16016 GOV_t} + \underset{(12.09)}{0.73703 K_{t-1}},$$

(Durbin-Watson = 2.56, $R^2 = 0.889$). (8)

The R^2 is statistically significant at the 1% level with both independent variables statistically significant.

The implied risk premium equation, corresponding to Equation (2a), is

$$K_t^* = 0.07533 - 0.39096 GOV_t. \quad (9)$$

This formulation, too, indicates an inverse relationship between risk premia, measured relative to Treasury bonds, and Treasury bond yields. In

particular, note that for a given 100 basis point increase in interest rates the risk premium decreases by 39 basis points. The relative change in risk premia is not as great, which is attributable to less interest rate variability and interest rate risk associated with Treasury bonds.¹⁵ Over the 1982-93 period, while Treasury yields fell by 578 basis points, Moody's utility bond yields fell by 777 basis points.

REGRESSION RESULTS WITH BOND YIELD VARIABILITY

A factor that could directly and significantly affect risk premia is investor-perceived variability in utility bond yields. It is likely that historical variability in those bond yields would impact investor perceptions of interest rate risk and increase utility bond yields. Furthermore, to the extent that there is some substitutability between utility common stocks and utility bonds, as interest rate risk associated with bonds increases, investors may increase their preferences for utility stocks. This should tend to decrease required returns on utility common stock.¹⁶ Both of these effects will tend to reduce the risk premium when utility bond interest rate risk increases.

While some of that interest rate variability may be picked up in the data on interest rate levels, those interest rate levels also reflect other factors, such as general tightness (or laxity) in capital market conditions, prevalence of call provisions, and differential tax wedges.¹⁷ Thus, we performed a regression analysis that explicitly included a measure for interest rate variability. An obvious measure is the standard deviation (S.D.) in interest rates in the immediate past. If our hypothesis is correct, an increase in the S.D. should decrease RP .

We considered two different historical time-frames for estimating the S.D.: 3 years and 5 years ($SD3$ and $SD5$, respectively). For example, with the 3 year time frame, the S.D. at month n is calculated using the 36 months prior to month n . With the 5-year time frame, the prior 60 months were used. Each of these measures was calculated separately for bond yields for Moody's *Aaa*, *Aa*, *A* and *Baa* utility bonds and then averaged across bond ratings to obtain the average $SD3$ and $SD5$ for each month.

Table 2. Regression Results With YD, Dependent Variable = K

Variable				
Constant	0.1077	0.0981	0.0790	0.1001
<i>t</i>	-0.0002** (-7.25)	-0.0002** (-6.16)	-0.0001** (-4.47)	-0.0002** (-6.09)
YD	0.2584** (7.55)	0.2032** (6.12)	0.1947** (5.57)	0.1950** (5.89)
SD3	-0.5087** (-5.31)			
RMSD3		-0.1695** (-3.91)		
SD5			-0.1282 (-1.43)	
RMSD5				
K_{t-1}	0.1302 (1.59)	0.2131* (2.60)	0.3312** (4.18)	-0.1307** (-3.83)
R ²	0.9332**	0.9270**	0.9194**	0.9267**
Durbin-Watson	2.06	2.08	2.15	2.07
N	130	130	130	130

Note: *t*-statistics in parentheses. * and ** indicate significance at the 5% and 1% levels, respectively.

These are reasonable historical time frames for purposes of estimating forward-looking investor expectations of interest rate risk. Of course, if there has been little change in these S.D.s during the sample period, then none of this matters. However, as discussed in Berry (1995) there has been significant volatility in bond yields. This has led to sharp increases in S.D.s in the early 1980s (almost triple the level in the 1970s), with some decrease in the latter 1980s.

Another way of gauging this variability is to consider the deviation of the immediately preceding month's yield from the relevant prior months' yields. As in the case of S.D.s, 3- and 5-year lags were considered. For example, in the case of 3 years, the formula used to calculate the root mean square deviation (RMSD) in month *n* is

$$RMSD3(n) = \left(\left[\sum_{i=n-3}^{n-1} (YD_{n-i} - YD_i)^2 \right] / 36 \right)^{1/2} \quad (10)$$

where YD_{n-1} is the yield in the immediately preceding month and YD_i , $i = 1, \dots, n-1$, corresponds to the yields in the prior months. An analogous formula for RMSD (RMSD5) was used for the case of 5 years. As in the cases for SD3 and SD5, different data series were calculated for the four Moody's bond ratings and then averaged across bond ratings.

The RMSD may be an appropriate measure of the risk perceived by an investor since it measures the potential interest rate swings (based on prior months' interest rates) relative to the immediately preceding month's yield. In contrast, the variable S.D. measures interest variability over a prior time frame relative to the mean over that same time frame. That mean does not necessarily equal

a current yield, and hence may underestimate investor perceptions with regard to potential interest rate variability. Thus, usage of the RMSD assumes that, in month *n*, investors may look at month $n-1$'s yield relative to prior months' interest rates to gauge the full impact of any potential interest rate swing. Note that, as discussed in Berry (1995) the trends in RMSD are similar to those of S.D. To comprehend for the possibility of a time trend in risk premia we included a monthly trend variable, *t*. This type of variable was discussed in Morin (1994), pp. 291-292) and was statistically significant there.

Our more complete formulation using SD3 is then:

$$K_t^* = RP_t + YD_t \quad (11)$$

where

$$RP_t = \alpha + \beta t + \delta YD_t + \theta SD3_t. \quad (11a)$$

Assuming a regulator adjustment function as shown in Equation (3) and substituting Equations (11) and (11a) into Equation (3) produces our regression equation:

$$K_t = \alpha\gamma + \beta\gamma t + (\delta + 1)\gamma YD_t + \theta\gamma SD3_t + (1 - \gamma)K_{t-1}. \quad (12)$$

Similar regression equations were used for SD5, RMSD3 and RMSD5, where each of those variables were used in place of SD3. Our hypotheses are that the coefficient associated with *t* will be negative (consistent with Morin), the coefficient associated with YD will be positive, and that the coefficient associated with SD3 (SD5, RMSD3, RMSD5) will be negative, as investors shift their relative preference to utility stock as interest rate risk on utility bonds increase.

Table 3. Implied Risk Premium Results, Dependent Variable = *RP*

Variable				
Constant	0.1238	0.1247	0.1181	0.1267
<i>t</i>	-0.0002	-0.0003	-0.0002	-0.0003
<i>YD</i>	-0.7029	-0.7418	-0.7089	-0.7532
<i>SD3</i>	-0.5849			
<i>RMSD3</i>		-0.2154		
<i>SD5</i>			-0.1917	
<i>RMSD5</i>				-0.1654

Table 5. Implied Risk Premium Results, Dependent Variable = *RP*

Variable				
Constant	0.1366	0.1390	0.1208	0.1408
<i>t</i>	-0.0004	-0.0003	-0.0002	-0.0003
<i>GOV</i>	-0.7906	-0.8169	-0.7399	-0.8215
<i>SD3</i>	-0.3357			
<i>RMSD3</i>		-0.1848		
<i>SD5</i>			0.1045	
<i>RMSD5</i>				-0.1655

The dependent variable, *K*, was then regressed on the three independent variables: time, yield and measures of variability in yields. Those four regression results are shown in Table 2.

Note that the regression slope coefficients are generally significant, although the coefficient for *SD5* was not. There is a statistically significant downward time trend, which is consistent with the result in Morin. The effects of *YD* on *K* are positive and significant. Three of the four coefficients associated with interest rate risk, *SD3*, *RMSD3* and *RMSD5* are significant and negative as was hypothesized. Finally, note that all of the slope coefficients associated with *YD* are significantly less than one, which supports the hypothesis that as interest rates decrease risk premia increase.

As can be seen in Table 2, the adjustment coefficients are in the range 67–87%, which are higher than the adjustment coefficient of 43% from Equation (5). This can be explained by noting that Equation (5) does not include the other factors shown in Table 2 (in particular, interest rate variability). Consequently, the adjustment coefficient measurement in Equation (5) is

clouded by the effects of the other factors. It appears that regulators are not adjusting *K* to *K** very much (only 43%), simply because *K* is also reacting to other factors not captured in Equation (5). Table 2 properly captures those additional effects and isolates the larger adjustment coefficient effect.

The implied risk premium results, corresponding to Equation (11a), are shown in Table 3. As can be seen there, the coefficient associated with *YD* is between approximately -0.70 and -0.75. This indicates that each increase in utility bond yields of 100 basis points produces a decrease in the risk premium of 70 to 75 basis points. Increases in interest rates result in decreases in risk premia. Furthermore, the negative slope coefficients associated with interest rate risk, imply smaller risk premia as hypothesized. The trend variable in Table 3 has a negative slope, which is consistent with results reported in Morin (1994).¹⁸

To some extent the variable *YD* may include both the effects of general tightness or laxity in financial markets and interest rate risk. In order to better focus on the two separate factors, it would be appropriate to replace *YD* with *GOV* in

Table 4. Regression Results With *GOV*, Dependent Variable = *K*

Variable				
Constant	0.0781	0.0818	0.0639	0.0874
<i>t</i>	-0.0002** (-4.85)	-0.0002** (-5.10)	-0.0001** (-3.21)	-0.0002** (-5.44)
<i>GOV</i>	0.1197** (2.99)	0.1078** (2.66)	0.1376** (3.18)	0.1108** (2.80)
<i>SD3</i>	-0.1919 (-1.85)			
<i>RMSD3</i>		-0.1088* (-2.21)		
<i>SD5</i>			0.0553 (0.54)	
<i>RMSD5</i>				-0.1027** (-2.71)
<i>K_{t-1}</i>	0.4283** (5.30)	0.4113** (5.04)	0.4709** (6.01)	0.3794** (4.55)
<i>R</i> ²	0.9092**	0.9102**	0.9069**	0.9119**
Durbin-Watson	2.18	2.17	2.24	2.13
<i>N</i>	130	130	130	130

Note: *t*-statistics are in parentheses. * and ** indicate significance at the 5% and 1% levels, respectively.

Equations (11) and (11a), since *GOV* will more directly reflect changes in the supply and demand for loan funds, without the effect of utility bonds' interest rate risk. The corresponding equations with *SD3* are:

$$K^* = RP_i + GOV, \quad (13)$$

$$RP_i = \alpha + \beta t + \delta GOV_i + \theta SD3, \quad (13a)$$

These Equations focus on the relationship between utility stocks and government bonds. Assuming an adjustment mechanism as shown in Equation (3) a regression equation analogous to Equation (12) can be developed. Those regression results are shown in Table 4 and are similar to those from Table 2. However, note that the slope coefficients associated with *GOV* are smaller than those associated with *YD* in Table 2. This is consistent with the results in Berry (1995) wherein it was shown that *GOV* had a larger effect on utility bond yields than on utility common stock dividend yields. Given an imperfect, although positive, relationship between Treasury bonds and utility bonds, and an imperfect relationship between utility bonds and utility stocks, it naturally follows that there would be an even more imperfect relationship between Treasury bonds and utility stocks. This means that there is more substitutability between utility common stocks and utility bonds than between utility stocks and US Treasury bonds. A further point to note from Table 4 is that the slope coefficients associated with *S.D.* are statistically insignificant, while those associated with *RMSD* are significant.

The implied risk premium results, corresponding to Equation (13a) are shown in Table 5. As can be seen there, the coefficient associated with *GOV* is between approximately -0.74 and -0.82 less than those associated with *YD* in Table 3. This is consistent with the point raised above concerning relative substitutability between stocks and bonds. An increase in Treasury yields of 100 basis points produces an increase of 18–26 basis points in the cost of equity, and a corresponding decrease in the risk premium of 74–82 basis points. In sharp contrast to the reported results in Table 1, controlling for other factors, risk premia relative to Treasury yields are not necessarily stable, but change as Treasury yields change. Increases in Treasury yields result in decreases in risk premia, and those decreases are greater than those associated with similar in-

creases in utility bond yields. Furthermore, the negative slope coefficients associated with utility bond interest rate risk, imply smaller risk premia as hypothesized. The trend variable in Table 5 has a negative slope, which is consistent with results reported in Morin (1994), as well as in Table 3.

CONCLUSIONS

This paper examined, through regression analysis, the possibility that there is an inverse relationship between risk premia and both interest rates and interest rate risk in the utility industry. We demonstrated that that is the case over the 1982–93 time period. Furthermore, it was shown that there is a statistically significant basis for asserting that risk premia increase as interest rates decrease. Our analysis also indicated that there was a downward time trend in risk premia in that period. All of these phenomena occurred with either utility bond yields or long-term US Treasury bond yields. However, for an equivalent increase in either utility bond yields or Treasury yields, required equity returns increase by a slightly greater amount with regard to utility bond yields.

It was also shown that regulators may exhibit an inertia in their setting of allowed returns, such that they move partially to the new required return, in the event capital conditions warrant a change. The degree of movement is in the range of 50–80% relative to the prior month's allowed return.

There are several policy implications from the above analysis. First, when regulators use the risk premium method for setting the allowed return on equity, they should consider the degree of recent interest rate variability and consequent interest rate risk, in comparing utility common stocks and utility bonds. The appropriate risk premium will be narrower the greater the interest rate risk. As demonstrated here, the better measure of interest rate risk is *RMSD*, not *S.D.* Second, objective regulators who attempt to utilize the risk premium method should implicitly compensate for the indicated regulator inertia. For example, calculate the risk premium using K^* , rather than K . Third, while Table 1 implies that risk premia relative to Treasury bonds are more stable, that is not the case when consideration is made for other factors, as shown in Tables 4 and 5. There is not necessarily any gain in precision in using a risk premium method based on Treasury bonds.

Fourth, if the US enters a period of relative stability in interest rates, we are likely to see utility risk premia increase, a phenomenon utility executives nor regulators have any degree of control over. This widening will not occur because of increases in required equity returns, but because of relatively lower interest rates and less interest rate risk.

NOTES

1. See Bonbright *et al.*, 1988 (pp. 317–28) for a discussion of these methods.
2. Gordon and Halpern (1976) show that an increase in variable and uncertain inflation will theoretically decrease the spread between bond and share yields. This acts through the Fisher effect and the resultant increase in interest rate uncertainty. Examples of rate cases where this argument has been made are Arkansas Public Service Commission (1987), Docket No. 87-070-U, Federal Energy Regulatory Commission (1986), Docket Nos. EL86-58-000 and EL86-59-000, Hawaii Public Utility Commission, Docket No. 4156, Kentucky Public Service Commission, Case No. 8045, and Pennsylvania Public Utility Commission, Docket R-811510.
3. These points are noted in Brigham *et al.* (1985) and Taylor and Peake (1982).
4. See Ibbotson Associates (1993), Carleton *et al.* (1983), Brigham *et al.* (1985) and Harris (1986) for a discussion of risk premia.
5. See Brennan (1982), Brigham *et al.* (1985) and Harris (1986). Other sources are Harris and Marston (1992), Gordon and Halpern (1976) and Federal Energy Regulatory Commission Staff (1992).
6. This approach was also taken in the Federal Energy Regulatory Commission (1992) Staff study.
7. During the same period, any interest rate risk associated with Treasury bonds was not as large, nor did it exhibit as large a decrease.
8. Given the rate case process (testimony, hearing, order writing) a 6 month lag is reasonable. However, if the 6 month period is either too long or short, the analysis here would only result in a mis-estimate of the intercept term, not the slope coefficients. For example, in a period of increasing interest rates (non-accelerating), if the appropriate lag should have been only 3 months, the 6 month lag will result in an over-estimate of the intercept term, but no mis-estimate of the slope terms. With a non-decelerating decrease in interest rates, the intercept term will be under-estimated, with no mis-estimated slope terms. The focus of this paper is on the slope terms. Furthermore, regression analyses was also performed using (a) bond yields contemporaneous with the date of the allowed return and (b) bond yields from 12 months earlier. In both those cases, the Durbin–Watson statistics

were worse and the corresponding R^2 were less than with the 6 month lag. Additionally, the slope coefficients for the YD and GOV variables were not as large, nor as significant as in the 6 month lag case. Consequently, the 6 month lag scenario was utilized here.

9. For the electric and gas rate cases the data was from *Public Utilities Fortnightly's* 'Annual Surveys', while the telecommunications data was from *Public Utilities Fortnightly's* 'Selected Utility Rate Filings'.
10. The data was aggregated into monthly data for three reasons. First, Durbin–Watson statistics can then be sensibly calculated. Second, this approach is consistent with prior studies. Third, this aggregation facilitates the partial adjustment feature. There were months when there were no reported allowed returns, which decreased our total sample size.
11. See Johnston, 1972 (pp. 300–301), for discussion of this technique.
12. This approach implicitly assumes that regulators focus on allowed returns in other jurisdictions in the prior month. This is reasonable for two reasons. First, there is a certain amount of 'peer pressure' amongst regulators wherein they generally do not want their own jurisdiction's allowed returns to be out of line with other jurisdictions, unless justified by general financial and economic circumstances (such as changes in interest rates). Second, the last allowed rate of return for a particular utility may be anywhere from 6 months to 3 years earlier. Modelling those differing periods adds unnecessary complexity to the analysis, in light of the first point raised.
13. See Berry (1995) for an empirical investigation of the impact of interest rate variability on the level of interest rates.
14. Other explanations for an inverse relationship between interest rates and risk premia have to do with call provisions and tax rates. In a high interest rate environment firms will include more call provisions in new bond issues, for which bond investors require even higher interest rate compensation. Additionally, with increasing interest rates, the tax wedge applied to interest on bonds grows relative to that on common stock due to the favorable tax treatment on the capital gains component of stock returns.
15. It could also be attributable to increased utility credit risk during that period.
16. This effect can be readily observed in the DCF method where K is calculated as $D/P + g$. D is the expected dividend, P is the stock's market price, and g is the investor-expected long-term growth rate in dividends. As P increases because of investors' relative preference for utility stocks, K will decrease.
17. As shown in Berry (1995), the impact of the tightness of capital markets has differential effects on interest rates and common stock dividend yields.
18. This negative slope coefficient associated with the time variable also provides an explanation as to why the positive interest rate slope coefficients are

smaller in Table 3 than that reflected in Equation (2). Throughout the 1982–93 period, interest rates were generally decreasing, which according to the results in Table 3, will lead to decreases in required equity returns. However, during that same period the trend variable t was increasing. This increasing trend variable implies an additional source for decreases in required equity returns over that time period. Since Equation (2) does not explicitly separate out the trend variable, the overall effect in Equation (2) includes both of these effects, which will make the Equation (2) slope coefficient larger.

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REQUEST:

Refer to the Direct Testimony of Scott Park (Park Direct Testimony) page 4, lines 15–20.

- a. Provide the maximum capital and operation costs per kW and kWh for a Firm Dispatchable Resource for which East Bend would be retired under Duke Kentucky’s analysis.
- b. Provide the projected capital and operation costs of East Bend used in Duke Kentucky’s analysis.
- c. Provide the projected capital and operation costs for resource types that exhibit the required characteristics.

RESPONSE:

CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachment (b) only)

- a. This analysis cannot be reasonably conducted under the information given. The Encompass model solves for a set of resource additions and retirements that minimize costs given a set of assumptions. The Encompass model does not solve for the changes in certain parameters that would alter the plan. Further, populating the combination of capital and operating costs that would result in the replacement of East Bend by an FDR would be highly iterative with each iteration requiring a separate modification to the model inputs. Such a modeling process will take significant time to complete for each individual model run.

b. Please see STAFF-DR-02-029(b) Confidential Attachment which shows the capital expenditures for each scenario with the DEKY 21 IRP Portfolio.

c. A 2x1 J CC was assumed for modeling purposes and exhibits the required characteristics. Please see below for our CC assumptions as well as Attachment STAFF-DR-02-029(c).

Variable Operation and Maintenance (\$/MWh)

- Pertinent file: Confidential - Attachment STAFF-DR-02-029(c)
- This input is the same across all scenarios
- Resource (EnCost), TimeSeries and TimeSeriesDatedChanges tabs
- Pertinent TimeSeries names:
 - New CC Var O&M

Fixed Operation and Maintenance (\$/MW)

- Pertinent file: Confidential - Attachment STAFF-DR-02-029(c)
- This input is the same across all scenarios
- Resource (FixedCost/FixedRate), TimeSeries, TimeSeriesDatedChanges, and TimeSeriesFunctions tabs
- Pertinent TimeSeries names:
 - New CC DEKY Fixed Cost, New CC Duct DEKY Fixed Cost, New CC DEKY Fixed Fuel

Projected Capital Cost (\$000)

- Pertinent file: Confidential - Attachment STAFF-DR-02-029(c)
 - Project (OtherCosts), TimeSeries and TimeSeriesDatedChanges tabs
 - Pertinent TimeSeries names:
 - New CC DEK CapEx, New CC Esc
 - New CC DF DEK CapEx, New CC Esc

PERSON RESPONSIBLE: Scott Park

**CONFIDENTIAL PROPRIETARY TRADE
SECRET**

**STAFF-DR-02-029 (b)
CONFIDENTIAL ATTACHMENT**

FILED UNDER SEAL

Object	Sheet Name	Column Name	Input Description	Input Type	Default Value	Version 6.2.2
Allowance Program	AllowProg	Name	Name	String		
Allowance Program	AllowProg	Emission	Emission	Emission		
Allowance Program	AllowProg	ExcludeCst	Exclude From Production Costs	Lookup	No	
Allowance Program	AllowProg	ExpYears	Bank Expiration (Years)	Integer	0	
Allowance Program	AllowProg	AllowCost	Dispatch Cost (\$/allowance)	Time Series	0	
Allowance Program	AllowProg	AllowDef	Allowance Definition (allowance/ton)	Time Series	1	
Allowance Program	AllowProg	ExternCost	Externality Cost (\$/allowance)	Time Series	0	
Allowance Program	AllowProg	ReqRate	Required Emission Rate (lb/MWh)	Time Series	0	
Allowance Program	AllowProg	ReqRateCC	Required NGCC Emission Rate (lb/MWh)	Time Series	0	
Allowance Program	AllowProg	CCGenFac	NGCC Incremental Generation Factor	Time Series	0	
Allowance Program	AllowProg	AllowLimit	Allowance Annual Limit (allowances)	Time Series	999999	
Allowance Program	AllowProg	AllowPenlt	Allowance Shortage Penalty (\$/allowance)	Time Series	10000	
Allowance Program	AllowProg	MaxBank	Maximum Bank Size (allowances)	Time Series	999999	
Allowance Program	AllowProg	InitBank	Initial Bank (allowances)	Time Series	0	
Allowance Program	AllowProg	AllowWkLim	Allowance Weekly Limit (allowances/day)	Time Series	999999	
Allowance Program	AllowProg	AbateAmt	Abatement Amount (allowances)	Time Series	0	
Allowance Program	AllowProg	AbateCost	Abatement Cost (\$/allowance)	Time Series	0	
Allowance Program	AllowProg LoadGroups	AllowProg	Allowance Program	Allowance Program		
Allowance Program	AllowProg LoadGroups	ItemIndex	Optional	Integer		
Allowance Program	AllowProg LoadGroups	LoadGroup	Load Group	Load Group		
Allowance Program	AllowProg LoadGroups	Allocation	Allocation (%)	Time Series	100	
Allowance Program	AllowProg Abatement	AllowProg	Allowance Program	Allowance Program		
Allowance Program	AllowProg Abatement	ItemIndex	Optional	Integer		
Allowance Program	AllowProg Abatement	AbateAmt	Abatement Amount (allowances)	Time Series	0	
Allowance Program	AllowProg Abatement	AbateCost	Abatement Cost (\$/allowance)	Time Series	0	
Area	Area	Name	Name	String		
Area	Area	BA	Balancing Authority	Balancing Authority		
Area	Area	Bus	Bus	Bus		
Area	Area	MaxEnExp	Maximum Energy Exports (MW)	Time Series	999999	
Area	Area	MaxEnImp	Maximum Energy Imports (MW)	Time Series	999999	
Area	Area	MaxCapExp	Maximum Capacity Exports (MW)	Time Series	999999	
Area	Area	MaxCapImp	Maximum Capacity Imports (MW)	Time Series	999999	
Area	Area	NetExport	Powerflow Net Export (MW)	Time Series	0	
Area	Area	EnPrice	Energy Price (\$/MWh)	Time Series	0	
Area	Area	OnPkPrice	On-Peak Price (\$/MWh)	Time Series	-1	
Area	Area	OffPkPrice	Off-Peak Price (\$/MWh)	Time Series	-1	
Area	Area	CapPrice	Capacity Price (\$/kW-mth)	Time Series	0	
Area	Area	AddCapReq	Firm Capacity Adjustment (MW)	Time Series	0	
Area	Area	FirmPkAdj	Firm Peak Adjustment (ratio)	Time Series	-1	
Area	Area	ResMargLim	Reserve Margin Limit (%)	Time Series	1000	
Area	Area	TaxRate	Composite Income Tax Rate (%)	Time Series	0	
Area	Area DelPoint	Area	Area	Area		
Area	Area DelPoint	ItemIndex	Optional	Integer		
Area	Area DelPoint	Fuel	Fuel	Fuel		
Area	Area DelPoint	DelPoint	Delivery Point	Fuel Delivery Point		
Area Connection	AreaConn	Name	Name	String		

Area Connection	AreaConn	Area	Area	Area	
Area Connection	AreaConn	FromArea	From Area	Area	
Area Connection	AreaConn	AllowProg:(Index)	Allowance Program	Allowance Program	
Area Connection	AreaConn	MaxEnLim	Maximum Energy Limit (MW)	Time Series	999999
Area Connection	AreaConn	RevEnLim	Reverse Energy Limit (MW)	Time Series	999999
Area Connection	AreaConn	MaxCapLim	Maximum Capacity Limit (MW)	Time Series	999999
Area Connection	AreaConn	RevCapLim	Reverse Capacity Limit (MW)	Time Series	999999
Area Connection	AreaConn	MaxAnnLim	Maximum Annual Limit (GWh)	Time Series	999999
Area Connection	AreaConn	BackAnnLim	Reverse Annual Limit (GWh)	Time Series	999999
Area Connection	AreaConn	MaxWkLim	Maximum Weekly Limit (GWh/day)	Time Series	999999
Area Connection	AreaConn	BackWkLim	Reverse Weekly Limit (GWh/day)	Time Series	999999
Area Connection	AreaConn	Tariffs	Energy Tariffs (\$/MWh)	Time Series	0.001
Area Connection	AreaConn	RevTariffs	Reverse Energy Tariffs (\$/MWh)	Time Series	0.001
Area Connection	AreaConn	CapTariffs	Capacity Tariffs (\$/kW-year)	Time Series	0.001
Area Connection	AreaConn	RevCapTar	Reverse Capacity Tariffs (\$/kW-year)	Time Series	0.001
Area Connection	AreaConn	LossRate	Loss Rate (%)	Time Series	0
Area Connection	AreaConn	BackLoss	Reverse Loss Rate (%)	Time Series	0
Area Connection	AreaConn Emission	AreaConn	Area Connection	Area Connection	
Area Connection	AreaConn Emission	ItemIndex	Optional	Integer	
Area Connection	AreaConn Emission	Emission	Emission	Emission	
Area Connection	AreaConn Emission	RelRateMWh	Release Rate Linear (lb/MWh)	Time Series	0
Area Connection	AreaConn Emission	RevRateMWh	Reverse Release Rate (lb/MWh)	Time Series	0
Area Connection	AreaConn Unit Dates	AreaConn	Area Connection	Area Connection	
Area Connection	AreaConn Unit Dates	ItemIndex	Optional	Integer	
Area Connection	AreaConn Unit Dates	CommissionDate	First Date Online	Date	
Area Connection	AreaConn Unit Dates	RetirementDate	Last Date Online	Date	
Area Connection	AreaConn Unit Dates	Units	Number of Units	Number	
Balancing Authority	BA	Name	Name	String	
Balancing Authority	BA	CommitOpt	Commitment Option	Lookup	Full
Balancing Authority	BA	CapPeriod	Capacity Period	Lookup	Annual
Balancing Authority	BA	RefBus	Reference Bus	Bus	
Balancing Authority	BA	ReserveMth	Annual Reserve Month	Integer	0
Balancing Authority	BA	EnUnservd	Unservd Energy Price (\$/MWh)	Time Series	10000
Balancing Authority	BA	GenCurtail	Generation Curtailment Price (\$/MWh)	Time Series	-100
Balancing Authority	BA	TransPenlt	Transmission Limit Penalty (\$/MWh)	Time Series	10000
Balancing Authority	BA	MinShift	Minimum Shift Factor (%)	Time Series	0
Balancing Authority	BA	CapUnserve	Unservd Capacity Price (\$/kW-year)	Time Series	250
Balancing Authority	BA	ReqResMarg	Required Reserve Margin (%)	Time Series	-100
Balancing Authority	BA	MaxResMarg	Maximum Reserve Margin (%)	Time Series	-100
Balancing Authority	BA	MinResMarg	Minimum Reserve Margin (%)	Time Series	-100
Balancing Authority	BA	RefPrMult	Capacity Reference Price Multiplier	Time Series	1
Balancing Authority	BA	MaxFirmPV	Maximum Firm Solar Capacity (% of peak)	Time Series	999999
Balancing Authority	BA	WACC	Weighted Average Cost of Capital (%)	Time Series	0
Balancing Authority	BA	MaxAnnRet	Maximum Annual Retirements (MW)	Time Series	999999
Balancing Authority	BA Periods	BA	Balancing Authority	Balancing Authority	
Balancing Authority	BA Periods	ItemIndex	Optional	Integer	
Balancing Authority	BA Periods	PeriodDef	Period Definition	Time Series	0

BA Interchange	BAInt	Name	Name	String	
BA Interchange	BAInt	BA	Balancing Authority	Balancing Authority	
BA Interchange	BAInt	FromBA	From Balancing Authority	Balancing Authority	
BA Interchange	BAInt	MaxEnLim	Maximum Energy Limit (MW)	Time Series	999999
BA Interchange	BAInt	RevEnLim	Reverse Energy Limit (MW)	Time Series	999999
BA Interchange	BAInt	MaxCapLim	Maximum Capacity Limit (MW)	Time Series	999999
BA Interchange	BAInt	RevCapLim	Reverse Capacity Limit (MW)	Time Series	999999
BA Interchange	BAInt	Tariffs	Energy Tariffs (\$/MWh)	Time Series	0.001
BA Interchange	BAInt	RevTariffs	Reverse Energy Tariffs (\$/MWh)	Time Series	0.001
BA Interchange	BAInt	CapTariffs	Capacity Tariffs (\$/kW-year)	Time Series	0.001
BA Interchange	BAInt	RevCapTar	Reverse CapacityTariffs (\$/kW-year)	Time Series	0.001
BA Interchange	BAInt Resources	BAInt	BA Interchange	BA Interchange	
BA Interchange	BAInt Resources	ItemIndex	Optional	Integer	
BA Interchange	BAInt Resources	Resource	Resource	Resource	
BA Interchange	BAInt Resources	Ownership	Ownership (%)	Time Series	100
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Branch	Branch	BranchFlow	Branch Flow Reporting	Lookup	None
Branch	Branch	Bus	Bus	Bus	
Branch	Branch	FromBus	From Bus	Bus	
Branch	Branch	GroupName	Group Name	String	
Branch	Branch	PFCType	Flow Control Type	Lookup	None
Branch	Branch	RandomSeed	Random Outage Seed	Integer	0
Branch	Branch	Resistance	Resistance (pu)	Time Series	0
Branch	Branch	Reactance	Reactance (pu)	Time Series	0
Branch	Branch	NormRating	Normal Rating (MW)	Time Series	999999
Branch	Branch	EmerRating	Emergency Rating (MW)	Time Series	999999
Branch	Branch	NumMaint	Scheduled Outage Units	Time Series	0
Branch	Branch	FOR	Forced Outage Rate (%)	Time Series	0
Branch	Branch	FORLength	Forced Outage Length (Days)	Time Series	1
Branch	Branch	PFCSched	Scheduled Control	Time Series	0
Branch	Branch	PFCPenalty	Flow Control Penalty (\$/MWh)	Time Series	0
Branch	Branch	PFCAngLim	Maximum Phase Angle (deg)	Time Series	0
Bus	Bus	Name	Name	String	
Bus	Bus	Area	Area	Area	
Bus	Bus	BusNumber	Bus Number	Integer	0
Bus	Bus	BusReport	Bus LMP Reporting	Lookup	None
Bus	Bus	BusType	Bus Type	Lookup	Load
Bus	Bus	GroupName	Group Name	String	
Bus	Bus	Voltage	Voltage (kV)	Integer	0
Bus	Bus	Demand	Demand (MW)	Time Series	0
Bus	Bus	LoadArea	Load Area Override	Area	
Bus	Bus	LoadScale	Load Scaling Factor	Time Series	1
Bus	Bus	Resource	Resource	Resource	
Bus	Bus	GenOutput	Generator Output (MW)	Time Series	0
Bus	Bus	GenScale	Generation Scaling Factor	Time Series	1
Bus	Bus Load	Bus	Bus	Bus	
Bus	Bus Load	ItemIndex	Required	Integer	

Bus	Bus Load	Demand	Demand (MW)	Time Series	0
Bus	Bus Load	LoadArea	Load Area Override	Area	
Bus	Bus Load	LoadScale	Load Scaling Factor	Time Series	1
Bus	Bus Generator	Bus	Bus	Bus	
Bus	Bus Generator	ItemIndex	Required	Integer	
Bus	Bus Generator	Resource	Resource	Resource	
Bus	Bus Generator	GenOutput	Generator Output (MW)	Time Series	0
Bus	Bus Generator	GenScale	Generation Scaling Factor	Time Series	1
Company	Company	Name	Name	String	
Company	Company	WACC	Weighted Average Cost of Capital (%)	Time Series	0
Company	Company	TaxRate	Composite Income Tax Rate (%)	Time Series	0
Company	Company Asset	Company	Company	Company	
Company	Company Asset	ItemIndex	Optional	Integer	
Company	Company Asset	AssetType	Type of Asset	Sheet Name	
Company	Company Asset	Asset	Asset	Asset	
Company	Company Asset	Ownership	Ownership (%)	Time Series	100
Contingency	Contingent	Name	Name	String	
Contingency	Contingent	BranchFlow	Branch Flow Reporting	Lookup	None
Contingency	Contingent	ContBranch:(Index)	Contingent Branch	Branch	
Contingency	Contingent Monitored	Contingent	Contingency	Contingency	
Contingency	Contingent Monitored	ItemIndex	Optional	Integer	
Contingency	Contingent Monitored	MonElementType	Type of MonElement	Sheet Name	
Contingency	Contingent Monitored	MonElement	Monitored Element	MonElement	
Emission	Emission	Name	Name	String	
Financial Contract	FinCont	Name	Name	String	
Financial Contract	FinCont	ContType	Contract Type	Lookup	Fuel
Financial Contract	FinCont	FromPoint	Contract From Point	Location	
Financial Contract	FinCont	Location	Contract Location	Location	
Financial Contract	FinCont	PurcAmount	Purchased Amount	Time Series	0
Financial Contract	FinCont	ContrPrice	Contract Price	Time Series	0
Fuel	Fuel	Name	Name	String	
Fuel	Fuel	FuelUnits	Unit of Measure (FUnit)	String	
Fuel	Fuel	GroupName	Group Name	String	
Fuel	Fuel	HeatCont	Heat Content (mmBtu/FUnit)	Time Series	1
Fuel	Fuel	DelPoint	Delivery Point	Fuel Delivery Point	
Fuel	Fuel	DelivCost	Delivery Costs (\$/FUnit)	Time Series	0
Fuel	Fuel	MaxWkFuel	Maximum Weekly Fuel Limit (FUnit/day)	Time Series	9999999
Fuel	Fuel	MinWkFuel	Minimum Weekly Fuel Limit (FUnit/day)	Time Series	0
Fuel	Fuel	FuelLimPen	Fuel Limit Violation Cost (\$/FUnit)	Time Series	1000
Fuel	Fuel	DelivMult	Delivery Cost Multiplier	Time Series	1
Fuel	Fuel	FixedCost	Fixed Costs (\$000/yr)	Time Series	0
Fuel	Fuel	FlowLimit	Maximum Fuel Flow (FUnit/hr)	Time Series	9999999
Fuel	Fuel	FlowPen	Flow Limit Violation Cost (\$/FUnit)	Time Series	10000
Fuel	Fuel	MaxDayFuel	Maximum Daily Fuel Limit (FUnit)	Time Series	9999999
Fuel	Fuel	MinDayFuel	Minimum Daily Fuel Limit (FUnit)	Time Series	0
Fuel	Fuel	MaxAnnFuel	Maximum Annual Fuel Limit (FUnit)	Time Series	9999999
Fuel	Fuel	MinAnnFuel	Minimum Annual Fuel Limit (FUnit)	Time Series	0

Fuel	Fuel	MaxFuelInv	Maximum Fuel Inventory (FUnits)	Time Series	9999999
Fuel	Fuel	MinFuelInv	Minimum Fuel Inventory (FUnits)	Time Series	0
Fuel	Fuel	TargetInv	Targeted Fuel Inventory (FUnits)	Time Series	-1
Fuel	Fuel	FuelInvInj	Fuel Inventory Injections (FUnits/day)	Time Series	0
Fuel	Fuel Supply	Fuel	Fuel	Fuel	
Fuel	Fuel Supply	ItemIndex	Optional	Integer	
Fuel	Fuel Supply	SupplyLev	Annual Fuel Supply Level (FUnit)	Time Series	9999999
Fuel	Fuel Supply	SupplyCost	Incremental Fuel Supply Cost (\$/FUnit)	Time Series	0
Fuel	Fuel Emission	Fuel	Fuel	Fuel	
Fuel	Fuel Emission	ItemIndex	Optional	Integer	
Fuel	Fuel Emission	Emission	Emission	Emission	
Fuel	Fuel Emission	RelRate	Release Rate (lb/mmBtu)	Time Series	0
Fuel	Fuel DelPoint	Fuel	Fuel	Fuel	
Fuel	Fuel DelPoint	ItemIndex	Optional	Integer	
Fuel	Fuel DelPoint	DelPoint	Delivery Point	Fuel Delivery Point	
Fuel	Fuel DelPoint	DelivCost	Delivery Costs (\$/FUnit)	Time Series	0
Fuel	Fuel DelPoint	StartDelPt	Starting Delivery Point	Fuel Delivery Point	
Fuel	Fuel DelPoint	MaxWkFuel	Maximum Weekly Fuel Limit (FUnit/day)	Time Series	9999999
Fuel	Fuel DelPoint	MinWkFuel	Minimum Weekly Fuel Limit (FUnit/day)	Time Series	0
Fuel	Fuel DelPoint	FuelLimPen	Fuel Limit Violation Cost (\$/FUnit)	Time Series	1000
Fuel	Fuel DelPoint	DelivMult	Delivery Cost Multiplier	Time Series	1
Fuel	Fuel DelPoint	FixedCost	Fixed Costs (\$000/yr)	Time Series	0
Fuel	Fuel DelPoint	FlowLimit	Maximum Fuel Flow (FUnit/hr)	Time Series	9999999
Fuel	Fuel DelPoint	FlowPen	Flow Limit Violation Cost (\$/FUnit)	Time Series	10000
Fuel	Fuel DelPoint	MaxDayFuel	Maximum Daily Fuel Limit (FUnit)	Time Series	9999999
Fuel	Fuel DelPoint	MinDayFuel	Minimum Daily Fuel Limit (FUnit)	Time Series	0
Fuel	Fuel DelPoint	MaxAnnFuel	Maximum Annual Fuel Limit (FUnit)	Time Series	9999999
Fuel	Fuel DelPoint	MinAnnFuel	Minimum Annual Fuel Limit (FUnit)	Time Series	0
Fuel	Fuel DelPoint	MaxFuelInv	Maximum Fuel Inventory (FUnits)	Time Series	9999999
Fuel	Fuel DelPoint	MinFuelInv	Minimum Fuel Inventory (FUnits)	Time Series	0
Fuel	Fuel DelPoint	TargetInv	Targeted Fuel Inventory (FUnits)	Time Series	-1
Fuel	Fuel DelPoint	FuelInvInj	Fuel Inventory Injections (FUnits/day)	Time Series	0
Fuel Delivery Point	FuelDelPt	Name	Name	String	
Fuel Delivery Point	FuelDelPt	Fuel	Fuel	Fuel	
Hub	Hub	Name	Name	String	
Hub	Hub	BusReport	Bus LMP Reporting	Lookup	None
Hub	Hub	HubType	Hub Type	Lookup	Factor
Hub	Hub Bus	Hub	Hub	Hub	
Hub	Hub Bus	ItemIndex	Optional	Integer	
Hub	Hub Bus	Bus	Bus	Bus	
Hub	Hub Bus	Factor	Factor	Time Series	1
Load Group	LoadGroup	Name	Name	String	
Load Group	LoadGroup	Area	Area	Area	
Load Group	LoadGroup	Demand	Demand (MW)	Time Series	0
Load Group	LoadGroup	AnnPeak	Annual Peak (MW)	Time Series	-1
Load Group	LoadGroup	AnnEnergy	Annual Energy (GWh)	Time Series	-1
Load Group	LoadGroup	MthPeak	Monthly Peak (MW)	Time Series	-1

Load Group	LoadGroup	MthEnergy	Monthly Energy (GWh)	Time Series	-1
Load Group	LoadGroup	FirmPkAdj	Firm Peak Adjustment (ratio)	Time Series	-1
Load Group	LoadGroup	RetailLoss	Retail Loss Rate (%)	Time Series	0
Load Group	LoadGroup	RetailRate	Retail Rate (c/kWh)	Time Series	0
Load Group	LoadGroup Areas	LoadGroup	Load Group	Load Group	
Load Group	LoadGroup Areas	ItemIndex	Optional	Integer	
Load Group	LoadGroup Areas	Area	Area	Area	
Load Group	LoadGroup Areas	Allocation	Allocation (%)	Time Series	100
Operational Constraint	OperConstr	Name	Name	String	
Operational Constraint	OperConstr	MinOnline	Minimum Committed Units	Time Series	0
Operational Constraint	OperConstr	FirmCap	Firm Capacity (%)	Time Series	100
Operational Constraint	OperConstr Resource	OperConstr	Operational Constraint	Operational Constraint	
Operational Constraint	OperConstr Resource	ItemIndex	Optional	Integer	
Operational Constraint	OperConstr Resource	Resource	Resource	Resource	
Operational Constraint	OperConstr Resource	Factor	Factor	Time Series	1
Operational Constraint	OperConstr Levels	OperConstr	Operational Constraint	Operational Constraint	
Operational Constraint	OperConstr Levels	ItemIndex	Optional	Integer	
Operational Constraint	OperConstr Levels	LoadLevel	Loading Level (MW)	Time Series	0
Operational Constraint	OperConstr Levels	MinOnline	Minimum Committed Units	Time Series	0
Operational Constraint	OperConstr Levels	FirmCap	Firm Capacity (%)	Time Series	100
Project Constraint	ProjConstr	Name	Name	String	
Project Constraint	ProjConstr	MaxIncAdd	Maximum Project Additions	Time Series	999999
Project Constraint	ProjConstr	MaxCumAdd	Maximum Active Projects	Time Series	999999
Project Constraint	ProjConstr	MinProject	Minimum Active Projects	Time Series	0
Project Constraint	ProjConstr Project	ProjConstr	Project Constraint	Project Constraint	
Project Constraint	ProjConstr Project	ItemIndex	Optional	Integer	
Project Constraint	ProjConstr Project	Project	Project	Project	
Project Constraint	ProjConstr Project	Factor	Factor	Time Series	1
Project	Project	Name	Name	String	
Project	Project	AddUnits	Number of Units to Add	Integer	0
Project	Project	AreaConn	Area Connection	Area Connection	
Project	Project	BegYear	Project Beginning Year	Integer	0
Project	Project	BookLife	Book Life (Years)	Integer	0
Project	Project	DepProject	Dependent Project	Project	
Project	Project	NumRetire	Number of Units to Retire	Integer	0
Project	Project	OpLife	Operating Life (Years)	Integer	0
Project	Project	RateBase	Financing Method	Lookup	Unregulated
Project	Project	Region	Region	Region	
Project	Project	Resource	Resource	Resource	
Project	Project	RetireRes	Resource to Retire	Resource	
Project	Project	PartialYr	First Year for Partial Additions	Integer	9999
Project	Project	TaxLife	Tax Life (Years)	Integer	0
Project	Project	TxInsBasis	Property Tax and Insurance Basis	Lookup	Original
Project	Project	MaxIncAdd	Maximum Project Additions	Time Series	999999
Project	Project	MaxCumAdd	Maximum Active Projects	Time Series	999999
Project	Project	UnitProf	Units Profile	Time Series	0
Project	Project	CapExRate	Capital Expenditures (\$/kW)	Time Series	0

Project	Project	CapEx	Capital Expenditures (\$000)	Time Series	0
Project	Project	DebtRatio	Capitalization Debt Ratio (%)	Time Series	0
Project	Project	DebtRate	Debt Interest Rate (%)	Time Series	0
Project	Project	TaxRate	Composite Income Tax Rate (%)	Time Series	0
Project	Project	ROE	Targeted Return on Equity (%)	Time Series	0
Project	Project	TIER	Targeted TIER	Time Series	1
Project	Project	Insurance	Insurance Rate (%)	Time Series	0
Project	Project	PropTax	Property Tax Rate (%)	Time Series	0
Project	Project	ITC	Investment Tax Credit (%)	Time Series	0
Project	Project	AFUDC	AFUDC Rate (%)	Time Series	0
Project	Project	CapIntRate	Capitalized Interest Rate (%)	Time Series	0
Project	Project	CWIP	CWIP in Rate Base (%)	Time Series	0
Project	Project	DecommRate	Decommissioning Rate (%)	Time Series	0
Project	Project	OtherCosts	Other Operating Costs (\$000)	Time Series	0
Project	Project	AddTaxCred	Deferred Tax Credits (\$000)	Time Series	0
Project	Project	ActualCWIP	Annual Capital Expenditures (\$000)	Time Series	0
Project	Project	ActAFUDC	AFUDC (\$000)	Time Series	0
Project	Project	BookDep	Book Depreciation (\$000)	Time Series	0
Project	Project	TaxDep	Tax Depreciation (\$000)	Time Series	0
Project	Project	RtBaseAdj	Rate Base Adjustment (\$000)	Time Series	0
Project	Project	BegDefTax	Beginning Deferred Taxes (\$000)	Time Series	0
Project	Project Areas	Project	Project	Project	
Project	Project Areas	ItemIndex	Optional	Integer	
Project	Project Areas	Area	Area	Area	
Project	Project Areas	MinProject	Minimum Active Projects	Time Series	0
Project	Project Profile	Project	Project	Project	
Project	Project Profile	PriorYear	Years Prior to In Service	Integer	
Project	Project Profile	Value	Construction Profile	Number	
Region	Region	Name	Name	String	
Region	Region	MaintRank	Maintenance Priority	Integer	0
Region	Region	SpinORDC	Include ORDC in Spinning	Lookup	Yes
Region	Region	Rounding	Requirements Rounding Method	Lookup	None
Region	Region	Area:(Index)	Area	Area	
Region	Region	MaxEnExp	Maximum Energy Exports (MW)	Time Series	999999
Region	Region	MaxEnImp	Maximum Energy Imports (MW)	Time Series	999999
Region	Region	MaxCapExp	Maximum Capacity Exports (MW)	Time Series	999999
Region	Region	MaxCapImp	Maximum Capacity Imports (MW)	Time Series	999999
Region	Region	ContPrice	Operating Reserve Price (\$/MWh)	Time Series	0
Region	Region	SpinPrice	Spinning Reserve Price (\$/MWh)	Time Series	0
Region	Region	UpPrice	Regulation Up Price (\$/MWh)	Time Series	0
Region	Region	DownPrice	Regulation Down Price (\$/MWh)	Time Series	0
Region	Region	SupUpPrice	Supplemental Up Price (\$/MWh)	Time Series	0
Region	Region	SupDnPrice	Supplemental Down Price (\$/MWh)	Time Series	0
Region	Region	MaxAncExp	Maximum Ancillary Exports (MW)	Time Series	999999
Region	Region	MaxAncImp	Maximum Ancillary Imports (MW)	Time Series	999999
Region	Region	OpResv	Operating Reserves (MW)	Time Series	0
Region	Region	OpResvPct	Operating Reserves (% Load)	Time Series	0

Region	Region	OpResvGen	Operating Reserves (% Generation)	Time Series	0
Region	Region	AncCurtail	Reserve Curtailment Price (\$/MWh)	Time Series	10000
Region	Region	SpinReq	Spinning Required (% of OpResv)	Time Series	0
Region	Region	SpinReqMW	Spinning Required (MW)	Time Series	0
Region	Region	SpinTime	Spinning Response Time (minutes)	Time Series	0
Region	Region	SpinCurt	Spinning Curtailment Price (\$/MWh)	Time Series	10000
Region	Region	RegUp	Regulation Up (MW)	Time Series	0
Region	Region	RegDown	Regulation Down (MW)	Time Series	0
Region	Region	MxRegShare	Maximum Regulation Share (%)	Time Series	100
Region	Region	RegTime	Regulation Response Time (minutes)	Time Series	0
Region	Region	RegCurt	Regulation Curtailment Price (\$/MWh)	Time Series	10000
Region	Region	SuppUpPct	Supplemental Up Required (% Load)	Time Series	0
Region	Region	SuppUpMW	Supplemental Up Required (MW)	Time Series	0
Region	Region	SuppDwnPct	Supplemental Down Required (% Load)	Time Series	0
Region	Region	SuppDwnMW	Supplemental Down Required (MW)	Time Series	0
Region	Region	SuppCurt	Supplemental Curtailment Price (\$/MWh)	Time Series	10000
Region	Region	SuppTime	Supplemental Response Time (minutes)	Time Series	0
Region	Region	CapUnserve	Unserviced Capacity Price (\$/kW-year)	Time Series	250
Region	Region	ReqResMarg	Required Reserve Margin (%)	Time Series	-100
Region	Region	MaxResMarg	Maximum Reserve Margin (%)	Time Series	-100
Region	Region	MinResMarg	Minimum Reserve Margin (%)	Time Series	-100
Region	Region	RefPrMult	Capacity Reference Price Multiplier	Time Series	1
Region	Region Areas	Region	Region	Region	
Region	Region Areas	ItemIndex	Optional	Integer	
Region	Region Areas	Area	Area	Area	
Region	Region ORDC	Region	Region	Region	
Region	Region ORDC	ItemIndex	Optional	Integer	
Region	Region ORDC	LoadLevel	Loading Level (MW)	Time Series	0
Region	Region ORDC	LOLP	ORDC Loss of Load Probability	Time Series	0
Resource	Resource	Name	Name	String	
Resource	Resource	AltDispRes	Alternative Dispatch Resource	Resource	
Resource	Resource	Area	Area	Area	
Resource	Resource	CurtGroup	Curtailment Group	Integer	999
Resource	Resource	DependRes	Dependent Resource	Resource	
Resource	Resource	EIACode	EIA Code	Integer	
Resource	Resource	ForceOrder	Force Dispatch Order	Lookup	No
Resource	Resource	GroupName	Group Name	String	
Resource	Resource	FromArea	From Area	Area	
Resource	Resource	HeatMethod	Heat Rate Method	Lookup	Average
Resource	Resource	RandomSeed	Random Outage Seed	Integer	0
Resource	Resource	SharedRes	Shared Reservoir	Resource	
Resource	Resource	TechType	Technology Type	Lookup	
Resource	Resource	WasteHeat	Waste Heat Resource	Resource	
Resource	Resource	WHBypass	Waste Heat Bypass	Lookup	Yes
Resource	Resource	MaxCap	Maximum Capacity (MW)	Time Series	0
Resource	Resource	InvertCap	Inverter Capacity (MW)	Time Series	0
Resource	Resource	CapScalar	Capacity Scalar	Time Series	1

Resource	Resource	FirmCap	Firm Capacity (%)	Time Series	100
Resource	Resource	MaxCapBid	Maximum Capacity Bid (\$/kW-year)	Time Series	250
Resource	Resource	MinCapBid	Minimum Capacity Bid (\$/kW-year)	Time Series	0
Resource	Resource	MaxRetire	Maximum Units to Retire	Time Series	0
Resource	Resource	EnCost	Energy Costs (\$/MWh)	Time Series	0
Resource	Resource	OnlineCost	Online Costs (\$/hr)	Time Series	0
Resource	Resource	FixedCost	Fixed Costs (\$000/yr)	Time Series	0
Resource	Resource	FixedRate	Fixed Cost Rate (\$/kW-yr)	Time Series	0
Resource	Resource	NewUnitExp	New Unit Expense (\$000)	Time Series	0
Resource	Resource	RetailLoss	Retail Loss Rate (%)	Time Series	0
Resource	Resource	RetailRate	Retail Rate (c/kWh)	Time Series	0
Resource	Resource	MaxPrice	Maximum Price for Avoided Costs (\$/MWh)	Time Series	10000
Resource	Resource	CurtCost	Curtailement Costs (\$/MWh)	Time Series	0
Resource	Resource	FOR	Forced Outage Rate (%)	Time Series	0
Resource	Resource	FORLength	Forced Outage Length (Days)	Time Series	1
Resource	Resource	NumMaint	Scheduled Outage Units	Time Series	0
Resource	Resource	MaintShift	Allowable Maintenance Shift (Days)	Time Series	0
Resource	Resource	MOR	Maintenance Outage Rate (%)	Time Series	0
Resource	Resource	RampUp	Ramp Up Rate (MW/minute)	Time Series	999999
Resource	Resource	RampDown	Ramp Down Rate (MW/minute)	Time Series	999999
Resource	Resource	QSCap	Quick Start Capability (MW)	Time Series	0
Resource	Resource	NonSpinCst	Non Spinning Reserve Cost (\$/MWh)	Time Series	0
Resource	Resource	NonSpinBid	Non Spinning Reserve Bid (\$/MWh)	Time Series	0
Resource	Resource	SpinCap	Spinning Capability (MW)	Time Series	0
Resource	Resource	SpinCapPct	Spinning Capability (%)	Time Series	0
Resource	Resource	SpinRatio	Spinning Contribution Ratio	Time Series	1
Resource	Resource	SpinCost	Spinning Reserve Cost (\$/MWh)	Time Series	0
Resource	Resource	SpinBid	Spinning Reserve Bid (\$/MWh)	Time Series	0
Resource	Resource	RegCap	Regulation Capability (MW)	Time Series	0
Resource	Resource	RegDownCap	Regulation Down Capacity (MW)	Time Series	0
Resource	Resource	RegMaxCap	Regulation Max Capacity (MW)	Time Series	0
Resource	Resource	RegMinCap	Regulation Min Capacity (MW)	Time Series	0
Resource	Resource	RegCost	Regulating Cost (\$/MWh)	Time Series	0
Resource	Resource	RegUpBid	Regulation Up Bid (\$/MWh)	Time Series	0
Resource	Resource	RegDownBid	Regulation Down Bid (\$/MWh)	Time Series	0
Resource	Resource	SuppOnCap	Supplemental Online Capabiility (MW)	Time Series	0
Resource	Resource	SuppOffCap	Supplemental Offline Capabiility (MW)	Time Series	0
Resource	Resource	SuppCost	Supplemental Cost (\$/MWh)	Time Series	0
Resource	Resource	SuppOnBid	Supplemental Online Up Bid (\$/MWh)	Time Series	0
Resource	Resource	SuppOffBid	Supplemental Offline Bid (\$/MWh)	Time Series	0
Resource	Resource	SuppDwnBid	Supplemental Down Bid (\$/MWh)	Time Series	0
Resource	Resource	SuppDwnCap	Supplemental Down Capacity (MW)	Time Series	0
Resource	Resource	MinCap	Minimum Capacity (MW)	Time Series	0
Resource	Resource	MinOnline	Minimum Committed Units	Time Series	0
Resource	Resource	MinUptime	Minimum Uptime (Hours)	Time Series	0
Resource	Resource	MinDwntime	Minimum Downtime (Hours)	Time Series	0
Resource	Resource	ExpectRun	Expected Runtime (Hours)	Time Series	0

Resource	Resource	WarmStrtHr	Maximum Hours for Warm Start	Time Series	0
Resource	Resource	HotStrtHr	Maximum Hours for Hot Start	Time Series	0
Resource	Resource	ColdStCost	Cold Startup Costs (\$)	Time Series	0
Resource	Resource	WarmStCost	Warm Startup Costs (\$)	Time Series	0
Resource	Resource	HotStCost	Hot Startup Costs (\$)	Time Series	0
Resource	Resource	ShutCost	Shutdown Costs (\$)	Time Series	0
Resource	Resource	CommitMult	Commitment Bid Multiplier	Time Series	1
Resource	Resource	CommitAdd	Commitment Bid Adder (\$)	Time Series	0
Resource	Resource	MaxStart	Maximum Starts	Time Series	1000
Resource	Resource	MaxShut	Maximum Shutdowns	Time Series	1000
Resource	Resource	MaxDaySt	Maximum Daily Starts	Time Series	1000
Resource	Resource	MaxWeekSt	Maximum Weekly Starts	Time Series	1000
Resource	Resource	MaxAnnSt	Maximum Annual Starts	Time Series	999999
Resource	Resource	MaxDayHrs	Maximum Daily Hours Online	Time Series	999999
Resource	Resource	MaxWeekHrs	Maximum Weekly Hours Online	Time Series	999999
Resource	Resource	MaxAnnHrs	Maximum Annual Hours Online	Time Series	999999
Resource	Resource	NetGenLim	Net Dispatch Limit (%)	Time Series	100
Resource	Resource	MaxDayEn	Maximum Daily Energy (%)	Time Series	100
Resource	Resource	MaxWeekEn	Maximum Weekly Energy (%)	Time Series	100
Resource	Resource	MinWeekEn	Minimum Weekly Energy (%)	Time Series	0
Resource	Resource	MaxAnnEn	Maximum Annual Energy (%)	Time Series	100
Resource	Resource	MinAnnEn	Minimum Annual Energy (%)	Time Series	0
Resource	Resource	LoadFollow	Proportional Load Following	Time Series	0
Resource	Resource	DispRange	Load Following Dispatch Range (%)	Time Series	0
Resource	Resource	PaybckReq	Payback Required (%)	Time Series	0
Resource	Resource	PaybckCap	Payback Capacity (MW)	Time Series	999999
Resource	Resource	MaxStorage	Maximum Stored Energy (MWh)	Time Series	999999
Resource	Resource	MinStorage	Minimum Stored Energy (MWh)	Time Series	0
Resource	Resource	StorInflow	Storage Net Inflow (MW)	Time Series	0
Resource	Resource	MinPayback	Minimum Payback Capacity (MW)	Time Series	0
Resource	Resource	StoreLoss	Storage Loss Rate (%/hour)	Time Series	0
Resource	Resource	PaybckDep	Payback Dependency (%)	Time Series	100
Resource	Resource	HeatCurveA	Heat Rate Curve Fixed (mmBtu/hr)	Time Series	0
Resource	Resource	HeatCurveB	Heat Rate Curve Linear (mmBtu/MWh)	Time Series	0
Resource	Resource	HeatCurveC	Heat Rate Curve Quadratic (mmBtu/MWh/MW)	Time Series	0
Resource	Resource	HeatCurveD	Heat Rate Curve Cubic (mmBtu/MWh/MW/MW)	Time Series	0
Resource	Resource	HeatCurveE	Heat Rate Curve Quartic (mmBtu/MWh/MW/MW/MW)	Time Series	0
Resource	Resource	AvgHtRate	Heat Rate (Btu/kWh)	Time Series	0
Resource	Resource	DispAdder	Dispatch Cost Adder (\$/MWh)	Time Series	0
Resource	Resource	DispMult	Dispatch Cost Multiplier	Time Series	1
Resource	Resource	PriFuelBld	Primary Fuel Blend (%)	Time Series	0
Resource	Resource	PartialOut	Partial Outage Rate (%)	Time Series	0
Resource	Resource	Fuel	Fuel	Fuel	
Resource	Resource	DelPoint	Delivery Point	Fuel Delivery Point	
Resource	Resource	DelivCost	Delivery Costs (\$/FUnit)	Time Series	0
Resource	Resource	DelivMult	Delivery Cost Multiplier	Time Series	1
Resource	Resource	HotStFuel	Hot Startup Usage (FUnit)	Time Series	0

Resource	Resource	WarmStFuel	Warm Startup Usage (FUnit)	Time Series	0
Resource	Resource	ColdStFuel	Cold Startup Usage (FUnit)	Time Series	0
Resource	Resource	ShutFuel	Shutdown Usage (FUnit)	Time Series	0
Resource	Resource	PowerToGas	Power To Gas Conversion Rate (kWh/FUnit)	Time Series	0
Resource	Resource	StorDepPen	Storage Cycle Depth Penalty (\$/MWh)	Time Series	0
Resource	Resource	Comments	Comments	String	
Resource	Resource Programs	Resource	Resource	Resource	
Resource	Resource Programs	ItemIndex	Optional	Integer	
Resource	Resource Programs	AllowProg	Allowance Program	Allowance Program	
Resource	Resource Programs	Allocation	Allocation (%)	Time Series	100
Resource	Resource Blocks	Resource	Resource	Resource	
Resource	Resource Blocks	ItemIndex	Optional	Integer	
Resource	Resource Blocks	LoadLevel	Loading Level (MW)	Time Series	0
Resource	Resource Blocks	AvgHtRate	Heat Rate (Btu/kWh)	Time Series	0
Resource	Resource Blocks	DispAdder	Dispatch Cost Adder (\$/MWh)	Time Series	0
Resource	Resource Blocks	DispMult	Dispatch Cost Multiplier	Time Series	1
Resource	Resource Blocks	PriFuelBld	Primary Fuel Blend (%)	Time Series	0
Resource	Resource Blocks	PartialOut	Partial Outage Rate (%)	Time Series	0
Resource	Resource Emission	Resource	Resource	Resource	
Resource	Resource Emission	ItemIndex	Optional	Integer	
Resource	Resource Emission	Emission	Emission	Emission	
Resource	Resource Emission	RelRate	Release Rate (lb/mmBtu)	Time Series	0
Resource	Resource Emission	RemoveRate	Removal Rate (%)	Time Series	0
Resource	Resource Emission	RelRateA	Release Rate Fixed (lb/hr)	Time Series	0
Resource	Resource Emission	RelRateMWh	Release Rate Linear (lb/MWh)	Time Series	0
Resource	Resource Emission	RelRateC	Release Rate Quadratic (lb/MWh/MW)	Time Series	0
Resource	Resource Emission	RelRateD	Release Rate Cubic (lb/MWh/MW/MW)	Time Series	0
Resource	Resource Emission	RelRateE	Release Rate Quartic (lb/MWh/MW/MW/MW)	Time Series	0
Resource	Resource Fuel	Resource	Resource	Resource	
Resource	Resource Fuel	ItemIndex	Optional	Integer	
Resource	Resource Fuel	Fuel	Fuel	Fuel	
Resource	Resource Fuel	DelPoint	Delivery Point	Fuel Delivery Point	
Resource	Resource Fuel	MinBlend	Minimum Blend (%)	Time Series	0
Resource	Resource Fuel	MaxBlend	Maximum Blend (%)	Time Series	100
Resource	Resource Fuel	DelivCost	Delivery Costs (\$/FUnit)	Time Series	0
Resource	Resource Fuel	DelivMult	Delivery Cost Multiplier	Time Series	1
Resource	Resource Fuel	HotStFuel	Hot Startup Usage (FUnit)	Time Series	0
Resource	Resource Fuel	WarmStFuel	Warm Startup Usage (FUnit)	Time Series	0
Resource	Resource Fuel	ColdStFuel	Cold Startup Usage (FUnit)	Time Series	0
Resource	Resource Fuel	ShutFuel	Shutdown Usage (FUnit)	Time Series	0
Resource	Resource Fuel	PowerToGas	Power To Gas Conversion Rate (kWh/FUnit)	Time Series	0
Resource	Resource Storage	Resource	Resource	Resource	
Resource	Resource Storage	ItemIndex	Optional	Integer	
Resource	Resource Storage	StorDepPct	Storage Cycle Depth Percentage (%)	Time Series	0
Resource	Resource Storage	StorDepPen	Storage Cycle Depth Penalty (\$/MWh)	Time Series	0
Resource	Resource Unit Dates	Resource	Resource	Resource	
Resource	Resource Unit Dates	ItemIndex	Optional	Integer	

Resource	Resource Unit Dates	CommissionDate	First Date Online	Date	
Resource	Resource Unit Dates	RetirementDate	Last Date Online	Date	
Resource	Resource Unit Dates	Units	Number of Units	Number	
Time Series	TimeSeries	Name	Name	String	
Time Series	TimeSeries	DistType	Distribution Type	Lookup	None
Time Series	TimeSeries	DrawFreq	Random Draw Frequency (Months)	Integer	0
Time Series	TimeSeries	GroupName	Group Name	String	
Time Series	TimeSeries	IntTZone	Interval Data Time Zone	Lookup	
Time Series	TimeSeries	Repeat	Carry Forward Months	Integer	0
Time Series	TimeSeries	SheetName	Spreadsheet Name	String	
Time Series	TimeSeries	Escalation	Carry Forward Escalation Rate (%)	Time Series	0
Time Series	TimeSeries	HolidayVal	Holiday Values	Time Series	0
Time Series	TimeSeries	MaxValue	Maximum Value	Time Series	9999999
Time Series	TimeSeries	MinValue	Minimum Value	Time Series	-9999999
Time Series	TimeSeries	MeanRevert	Mean Reversion (%)	Time Series	100
Time Series	TimeSeries	Deviation	Deviation	Time Series	0
Time Series	TimeSeries	PeriodDef	Period Definition	Time Series	0
Time Series	TimeSeries	PeriodVal	Period Values	Time Series	0
Time Series	TimeSeries	Comments	Comments	String	
Time Series	TimeSeries Correlation	TimeSeries	Time Series	Time Series	
Time Series	TimeSeries Correlation	ItemIndex	Optional	Integer	
Time Series	TimeSeries Correlation	CorrelTS	Correlation Time Series	Time Series	0
Time Series	TimeSeries Correlation	Correlate	Correlation Factor	Time Series	0
Time Series	TimeSeries Periods	TimeSeries	Time Series	Time Series	
Time Series	TimeSeries Periods	ItemIndex	Optional	Integer	
Time Series	TimeSeries Periods	PeriodDef	Period Definition	Time Series	0
Time Series	TimeSeries Periods	PeriodVal	Period Values	Time Series	0
Time Series	TimeSeries Functions	TimeSeries	Time Series	Time Series	
Time Series	TimeSeries Functions	ItemIndex	Required	Integer	
Time Series	TimeSeries Functions	MathFunc	Math Function	Lookup	Add
Time Series	TimeSeries Functions	MathValue	Math Value	Time Series	0
Time Series	TimeSeriesDatedChanges* or TSDC*	TimeSeries	Time Series	Time Series	
Time Series	TimeSeriesDatedChanges* or TSDC*	ItemIndex	Optional	Integer	
Time Series	TimeSeriesDatedChanges* or TSDC*	EffectiveDate	Effective Date	Date	
Time Series	TimeSeriesDatedChanges* or TSDC*	EndingDate	Ending Date	Date	
Time Series	TimeSeriesDatedChanges* or TSDC*	Value	Daily Value	Number	
Time Series	TimeSeriesDatedChanges* or TSDC*	Interval:(Index)	Interval Value	Number	
Transmission Limit	TransLimit	Name	Name	String	
Transmission Limit	TransLimit	BranchFlow	Branch Flow Reporting	Lookup	None
Transmission Limit	TransLimit	MaxEnLim	Maximum Energy Limit (MW)	Time Series	999999
Transmission Limit	TransLimit	MinEnLim	Minimum Energy Limit (MW)	Time Series	-999999
Transmission Limit	TransLimit	MaxCapLim	Maximum Capacity Limit (MW)	Time Series	999999
Transmission Limit	TransLimit	MinCapLim	Minimum Capacity Limit (MW)	Time Series	-999999
Transmission Limit	TransLimit Element	TransLimit	Transmission Limit	Transmission Limit	
Transmission Limit	TransLimit Element	ItemIndex	Optional	Integer	
Transmission Limit	TransLimit Element	ElementType	Type of Element	Sheet Name	
Transmission Limit	TransLimit Element	Element	Element	Element	

Transmission Limit	TransLimit Element	Factor	Factor	Time Series	
Scenario	Scenario	Name	Name	String	
Scenario	Scenario	Parent	Parent Scenario	Scenario	
Scenario	Scenario	Dataset:(Sequence)	Dataset	Dataset	
Scenario	Scenario Settings	Scenario	Scenario	Scenario	
Scenario	Scenario Settings	RunStartDate	Start Date for Optimization	Date	
Scenario	Scenario Settings	RunEndDate	Ending Date for Optimization	Date	
Scenario	Scenario Settings	DrawStartDate	First Date for Random Draws	Date	
Scenario	Scenario Settings	DrawEndDate	Last Date for Random Draws	Date	
Scenario	Scenario Settings	MonteCarlo	Number of Random Draws	Integer	0
Scenario	Scenario Settings	RandomSeed	Random Number Seed	Integer	0
Scenario	Scenario Settings	SampleType	Sampling Method	Integer	0
Scenario	Scenario Settings	MonthSplit	Split Run Length (Months)	Integer	0
Scenario	Scenario Settings	SegDays	Optimization Period	Integer	0
Scenario	Scenario Settings	ExtDays	Extension Period	Integer	0
Scenario	Scenario Settings	ConvBasis	MIP Stop Basis	Integer	1
Scenario	Scenario Settings	MIPMaxTime	MIP Maximum Solve Time (seconds)	Integer	0
Scenario	Scenario Settings	MIPMaxTask	Maximum Memory (GB)	Integer	0
Scenario	Scenario Settings	RunType	Run Type	Lookup	0
Scenario	Scenario Settings	PriceOpt	Prices Option	Lookup	1
Scenario	Scenario Settings	DataOption	Data Suppression Option	Lookup	0
Scenario	Scenario Settings	ProjectOpt	Capital Project Optimize Option	Lookup	0
Scenario	Scenario Settings	NumPlans	Number of Plans	Integer	1
Scenario	Scenario Settings	PlanYear	Plans Unique Through	Year	2100
Scenario	Scenario Settings	InitProj	Use Parent Projects	Lookup	0
Scenario	Scenario Settings	PriorPlan	Parent Plan Number	Integer	1
Scenario	Scenario Settings	OutageOpt	Scheduled Outage Option	Lookup	0
Scenario	Scenario Settings	ForcedOpt	Forced Outage Option	Lookup	1
Scenario	Scenario Settings	InitOpt	Initial Condition/Typical Day Option	Lookup	1
Scenario	Scenario Settings	CommitOpt	Commitment Option	Lookup	0
Scenario	Scenario Settings	NodalOpt	Nodal Option	Lookup	0
Scenario	Scenario Settings	IntTZone	Interval Data Time Zone	Lookup	1
Scenario	Scenario Settings	IntMinutes	Minutes per Block	Integer	60
Scenario	Scenario Settings	IntBlocks:(Interval)	Blocks per Interval	Integer	1
Scenario	Scenario Settings	CommitBlks:(Interval)	Commitment Blocks per Interval	Integer	0
Scenario	Scenario Selections	Scenario	Scenario	Scenario	
Scenario	Scenario Selections	ItemID	BA/Company/AllowProg	Sheet Name	
Scenario	Scenario Selections	ItemIndex	Negative for suppressed BAs	Integer	
Scenario	Scenario Selections	Name	Selected Item	Object	
Scenario	Scenario Draws	Scenario	Scenario	Scenario	
Scenario	Scenario Draws	TimeSeries	TimeSeries	TimeSeries	
Scenario	Scenario Draws	Date	Effective Date	Date	
Scenario	Scenario Draws	Draw:(RunID)	Probability (between 0 and 1)	Number	
Dataset	Dataset	Name	Name	String	
Dataset	Dataset	Locked	0 for Unlocked, 1 for Locked	Integer	0

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-030

REQUEST:

Refer to the Park Direct Testimony, page 8, lines 16-19. Explain how Duke Kentucky forecasted fuel prices, and provide and explain any supporting documentation.

RESPONSE:

Please see Section 3 of the 2021 Duke Energy Kentucky IRP, which has been provided in this proceeding as SIERRA-DR-01-003 Confidential Attachment, for a discussion of the fuel price forecast.

PERSON RESPONSIBLE: Scott Park

REQUEST:

Refer to the Direct Testimony of Lisa M. Quilici (Quilici Direct Testimony), pages 6–13.

a. Explain how the original and revised expected life of East Bend compares to other coal plants recently retired or expected to be retired in Kentucky. Provide any supporting documentation.

b. Identify and describe any new environmental regulations, including additional requirements added to existing regulations, that Duke Kentucky expects will become effective and apply to East Bend in the next 15 years; identify when Duke Kentucky expects each such regulation or requirement to become effective; and explain each basis for Duke Kentucky’s response.

RESPONSE:

a. Objection. This request is overbroad and unduly burdensome and calls for speculation. Neither the Company nor Ms. Quilici maintain this information nor have performed this analysis as it would require examination of numerous regulatory dockets of the Commission and Integrated Resource Plans of multiple utilities over numerous years to determine with any degree of certainty. Without waiving said objection, and to the extent discoverable, the Company is aware of similar relevant data maintained by the Kentucky Environmental Cabinet that is publicly available on its website. Please see <https://eec.ky.gov/Energy/News-Publications/Pages/Power-Plant-Retirements-and-Additions.aspx>

b. Objection. This question is overly broad and requires a degree of speculation in asking for “*any* new environmental regulations, including additional requirements added to existing regulations.” Without waiving said objection, and in the spirit of discovery, the following are currently anticipated and significant new environmental regulations, including additional requirements added to existing regulations that Duke Energy Kentucky expects will become effective and apply to East Bend. Dates are based on EPA’s Fall 2022 Unified Agenda of Regulatory Actions:

- Cross State Air Pollution Rule (CSAPR) – EPA is expected EPA to finalize additional changes to CSAPR based on the agency’s March 2022 proposal. In that action EPA proposed to further reduce NOx emissions from fossil-fired electric generating units (EGUs) and certain industrial sources in 26 states. Beginning in 2023, the proposal would expand the Group 3 NOx ozone season trading program for EGUs from 12 states to 25 states and would imposes additional requirements. This rule is expected in late March of 2023.
- Mercury and Air Toxics Standards (MATS) - On February 9, 2022, EPA published a proposed rule which would revoke the May 22, 2020, finding that it is not “appropriate and necessary” to regulate power plant HAP emissions. EPA also announced that it would be reviewing the 2020 MATS Residual Risk and Technology Review and would solicit information on the performance and cost of new or improved technologies that control HAP emissions, improved methods of operation, and risk-related information to inform its review. EPA is expected to finalize its rule in the first half of 2023.

- Emission Guidelines for GHG Emissions from Existing EGUs – This rule would replace the former Affordable Clean Energy (ACE) rule and regulate CO₂ emissions. A proposal rule is expected in the second quarter of 2023 and a final rule potentially in the second quarter of 2024.
- Reconsideration of National Ambient Air Quality Standards (“NAAQS”) for Particulate Matter (“PM”). Final rule in August 2023.
- Reconsideration of Ozone NAAQS. Proposed rule in April 2023; no timetable for final rule.
- ELGs for the Steam Electric Power Generating Point Source Category. EPA intends to publish a proposed rule revising the 2015 and 2020 Steam Electric Power Generating Point Source Category effluent limitation guidelines (“ELGs”) in the first quarter of 2023. EPA also intends to publish a separate direct final action in the first quarter of 2023 to extend the date for existing coal-fired power plants to submit a notice of planned participation (“NOPP”) for the retirement subcategory from October 13, 2021, to 90 days after publication of this rule in the Federal Register.

PERSON RESPONSIBLE: As to objections, Legal
As to response, Lisa M. Quilici – a.
As to response, Michael Geers – b.

REQUEST:

Refer to the Direct Testimony of Bruce L. Sailers (Sailers Direct Testimony), page 14, lines 7–17, in which the revisions to the traffic lighting rate schedule are discussed.

- a. Confirm that the customer will be responsible for the maintenance of traffic lights if the proposed changes are approved.
- b. Explain how this change will be beneficial to the customers served under the traffic lighting rate schedule.
- c. Explain how the company maintenance option causes confusion and delay when traffic signals require repair.

RESPONSE:

- a. Confirmed.
- b. The Company maintenance for traffic lights is limited to the following as stated in the tariff sheet.
 - *Limited maintenance for traffic signals is defined as cleaning and replacing lamps and repairing connections in wiring which are of a minor nature. Limited maintenance for traffic controllers is defined as cleaning, oiling, adjusting and replacing contacts which are provided by customer, time-setting when requested, and minor repairs to defective wiring.*

When a traffic light needs repair, there can be customer confusion resulting in a delay since it is not certain who the customer should contact (i.e., the Company for a minor

issue or the repair vendor to fix the streetlight). In addition, the service is seldom used by the customer. The Company does not have records for bulb replacement since 2015 indicating the customers are not contacting the Company for this service. The benefits to the customer will be an elimination of a charge for service that customers are not using resulting in a lower charge for traffic light energy and the elimination of potential confusion related to traffic light repair when needed.

c. See response to (b) above.

PERSON RESPONSIBLE: Bruce L. Sailors

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-033

REQUEST:

Refer to the Sailers Direct Testimony, page 25, lines 14–21, in which changes to Rider LM, Load Management Rider, are discussed. Explain how the proposed revision will limit the avoidance of demand charges for off-peak demand.

RESPONSE:

For Rate DS and Rate DP customers, participating in Rider LM changes the calculation of billing demand from the maximum 15-minute period in the billing month to the maximum 15-minute period during only on-peak hours of the billing month. Therefore, off-peak demand could be added without impacting the billing demand calculation. In the past decades, the Company has not seen an issue develop from the addition of significant off-peak demand without a commensurate increase in on-peak demand. However, with the potential adoption of electric vehicle fleet charging, many customers could significantly increase off-peak demand (i.e., charging vehicles off-peak) without increases to on-peak demand. If left unaddressed, the issue could lead to needed changes in the on-peak period definition and/or base tariff redesign. The proposed changes to Rider LM expand the calculation of billing demand to the higher of on-peak demand or fifty (50) percent of off-peak demand. This change retains a significant incentive to add load off-peak but limits “free” off-peak demand to an off-peak demand amount of twice the amount of the customer’s on-peak demand.

PERSON RESPONSIBLE: Bruce L. Sailers

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-034

REQUEST:

Refer to the Sailers Direct Testimony, page 26, lines 25–26, in which Duke Kentucky states that the resulting rate net of the discount provided must cover the marginal cost to provide service to the customer. Explain the statement and provide any calculations and supporting documentation.

RESPONSE:

Based on the projected billed demand and energy consumption of the economic development customer, the Company will review the marginal cost to serve the new load and the projected revenues to be billed. There are three parts to reviewing the marginal cost to serve the new load: marginal capacity costs, marginal infrastructure requirements to serve the customer, and marginal energy cost. Comparing the marginal costs incurred over the contract period to the estimated revenue that will be billed ensures that the customer is paying enough revenue to cover the marginal cost to serve them. Each economic development contract is unique and requires individual review of the economic development project characteristics, loads, and investment requirements.

PERSON RESPONSIBLE: Bruce L. Sailers

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-035

REQUEST:

Refer to the Sailors Direct Testimony, page 27, lines 15–21, in which the changes to the Green Source Advantage Rider are discussed. Explain how revising the limit on the maximum annual amount of renewable capacity from 125 percent of the customer’s maximum annual demand to 100 percent of the customer’s annual energy consumption allows the customer to more closely match their total annual consumption with total annual generation from renewable resources. Provide any calculations and supporting documentation.

RESPONSE:

For customers with clean energy goals for their entire annual energy consumption, the 125 percent of maximum demand limitation does not allow many customers to cover their annual energy consumption. Therefore, it is beneficial to this type of customer to replace the 125 percent of the customer’s maximum demand restriction with the 100 percent of the customer’s annual energy consumption language.

For example, if a 5 MW peak demand customer with a 70% load factor (i.e., approximately 30,660,000 kWh) is limited to a 6.25 MW solar GSA purchase and the solar facility has a factor of 22 percent, then the solar facility would produce $6.25 \text{ MW} * 1000 \text{ kW/MW} * 8760 \text{ hours/year} * 22\% = 12,045,000 \text{ kWh / year}$. This would not be enough energy to cover the customers annual consumption. Especially for customers with high

load factors, the restriction of 125 percent of maximum demand would prevent them from covering all of their annual energy consumption under the GSA rider.

PERSON RESPONSIBLE: Bruce L. Sailors

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-036

REQUEST:

Refer to the Sailers Direct Testimony, page 29, lines 8–15, in which the changes to the Local Government Fee tariff are discussed. Explain the distinctions in the items that will be addressed through the Local Government Fee tariff and the Incremental Local Investment Charge tariff. Provide specific examples of each difference, and provide supporting documentation as to the necessity of each item.

RESPONSE:

The Local Government Fee tariff is for specific charges such as a franchise fee. For example, the fictional City of Kytown requires the Company to pay an annual franchise fee of \$100,000. This franchise fee would be covered under the Local Government Fee tariff.

The Incremental Local Investment Charge tariff is for investment requirements placed on the Company by a municipality outside the scope of the Company’s investment plans. For example, the fictional City of Kytown requires, by ordinance, that the Company underground all service inside the municipal limits. This fictional project is estimated to cost \$500 million. The Incremental Local Investment Charge tariff would be used to charge the cost of the project to the Company’s customers in the Kytown municipality instead of adding it to overall rate base where it would be paid by all the Company’s customers.

PERSON RESPONSIBLE: Bruce L. Sailers

REQUEST:

Refer to the Sailers Direct Testimony, Confidential Attachment BLS-6.

- a. Explain, in detail, the process that the vendor performs in order to remotely reconnect service.
- b. Explain, in detail, the process that a Duke Kentucky employee performs in order to remotely reconnect service.
- c. Explain the circumstances under which the vendor would perform the remote reconnection.
- d. Explain the circumstances under which a Duke Kentucky employee would perform the reconnection.
- e. Explain how the amount for each component was derived and provide any supporting documentation.

RESPONSE:

- a. The vendor can process a payment for reconnection. This is the only task the vendor handles for reconnection of service. Once the payment is processed, the system automatically creates the remote reconnection order. The remote reconnection is then processed by the Company's Meter Data Management (MDM) system. If the vendor encounters a more complicated customer service reconnection request, they transfer the call to a Duke Energy Kentucky customer care specialist.

b. A Duke Energy Kentucky employee can also process payment but in addition can process payment arrangements, partial payments, and pledges of assistance funds. The Duke Energy Kentucky employee can also manually create the reconnection service order as needed. In general, a Duke Energy customer service specialist will access the customer's account to validate sufficient payment has been received and/or process payment. As needed, they will navigate to the screen to create a service order. An order option specific for reconnections will be completed.

c. Incoming calls are routed to customer care specialist that might be Company employees or vendor employees. A vendor employee can process a reconnection request when a customer is making a payment that satisfies requirements for reconnection. Any more complicated reconnection requests are transferred to Company employees.

d. A Duke Energy Kentucky employee can perform all reconnection requests.

e. Each component is derived from monthly operational and/or financial data reports. The component values proposed represent average costs from the May 2022 through July 2022 time period.

PERSON RESPONSIBLE: Bruce L. Sailors

REQUEST:

Refer to the Direct Testimony of Lisa D. Steinkuhl (Steinkuhl Direct Testimony), page 16, line 14 through page 17, line 2.

a. Refer to KRS 278.183, Section 2, which states, in relevant part, “Recovery of costs ... that are not already included in existing rates shall be by environmental surcharge to existing rates imposed as a positive or negative adjustment to customer bills in the second month following the month in which costs are incurred.” Explain why Duke Kentucky is proposing to incorporate forecasted environmental surcharge costs into base rates.

b. Refer to KRS 278.183, Section 3, which states, in relevant part, “Every two (2) years the commission shall review and evaluate past operation of the surcharge, and after hearing, as ordered, shall ... to the extent appropriate, incorporate surcharge amounts found just and reasonable into the existing base rates of each utility.” Explain why Duke Kentucky is proposing to incorporate its historic environmental surcharge costs into base rates.

RESPONSE:

a. The Company is not proposing to incorporate forecasted environmental surcharge costs into base rates. The Company is proposing to roll historical plant in service included in Rider ESM into base rates.

b. The Company is proposing to incorporate historical plant in service into base rates in this proceeding. The Company believes it is a clean approach to ratemaking to include all historical plant in service in rate base and reset riders at the time new base rates are put into effect so as to reduce the surcharge going forward. However, if the Commission prefers the Company keep the plant in service in Rider ESM, the Company would not oppose that decision.

PERSON RESPONSIBLE: Sarah E. Lawler

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-039

REQUEST:

Refer to Schedule L-1, page 113, Rider FAC, Fuel Adjustment Clause. Also, refer to Duke Kentucky's current tariff on file with the Commission, KY. P.S.C. Electric No. 2, Eleventh Revised Sheet No. 80, page 2. Confirm that no changes have been proposed to this page.

RESPONSE:

Confirmed.

PERSON RESPONSIBLE: Bruce L. Sailors

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-040

REQUEST:

Refer to Schedule L-1, pages 152–153, Charges for Reconnection of Service.

- a. Provide detailed cost support for the non-remote \$60 and the \$125 reconnection fees.
- b. Provide detailed cost support for the additional \$40 fee for after-hours non-remote reconnections.
- c. Explain whether Duke employees or outside contractors perform non-remote reconnections. If both, explain the circumstances under which each would perform a non-remote reconnection, and for the previous two calendar years, provide the percentage of non-remote reconnections performed by each.
- d. Provide detailed cost support for the \$60 collection charge.
- e. Explain whether Duke Kentucky charges a disconnect fee when service is actually disconnected.

RESPONSE:

- a. The Company has not proposed a change in the non-remote reconnection charges. The cost support for the charges was provided in Case No. 2019-00271 in Attachment JLK-5, an attachment to Witness Kerns' testimony. This charge was approved by order of the Commission in Case No. 2019-00271. However, in response to Staff's request, please see STAFF-DR-02-040 Attachment.

b. The Company has not proposed a change in the non-remote reconnection charges. The cost support for the charges was provided in Case No. 2019-00271 in Attachment JLK-5, an attachment to Witness Kerns' testimony. This charge was approved by order of the Commission in Case No. 2019-00271. However, in response to Staff's request, please see STAFF-DR-02-040 Attachment.

c. Only Duke Energy Employees perform non-remote reconnections.

d. The Company has not proposed a change in the non-remote reconnection charges. The cost support for the charges was provided in Case No. 2019-00271 in Attachment JLK-5, an attachment to Witness Kerns' testimony. This charge was approved by order of the Commission in Case No. 2019-00271. However, in response to Staff's request, please see STAFF-DR-02-040 Attachment.

e. No fee is charged to disconnect service.

PERSON RESPONSIBLE: Bruce L. Sailors

Support for Current and Unchanged Reconnection Fees

Non Remote Reconnection			
Base Labor		\$40.53	
Unproductive	34.0%	\$13.78	Loads on Base - direct labor
Incentives	<u>11.0%</u>	<u>\$5.97</u>	Loads on Base plus Unprod
Subtotal		\$19.75	
Fringes	31.1%		
Payroll Tax	<u>7.5%</u>		
Subtotal	38.6%	\$23.26	Loads on Base plus Unprod plus Incentive
Fleet	30.8%	\$12.50	Loads on Base - direct labor
Loaded Labor w/ Fleet		\$96.04	
Indirects	30.8%	\$29.54	Load on Loaded Labor
Site Supervision			
Engineering	22.8%	\$21.87	Load on Loaded Labor
Setup	0.0%	\$0.00	Load on Loaded Labor
	53.5%		
Total Cost Per Hour		\$147.45	
	<u>Approximate Hours</u>	Cost	
Non-Remote Electric Reconnection	0.50	\$73.73	
Pole Reconnection	1.10	\$162.20	
Non-Remote After Hours	0.85	\$125.33	\$51.61 Incremental
Pole Reconnection After Hours	1.70	\$250.67	
Collection Charge (Field Visit)	0.50	\$73.73	

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-041

REQUEST:

Refer to Schedule L-2.2, page 8 of 152, Section III, Customer's Installations.

- a. Define what Duke Kentucky would consider a material change or increase in a customer's installation.
- b. Explain what types of upgrades or rearrangement could be required to Duke Kentucky's facilities to accommodate a customer's desired change in installation.
- c. Explain who is currently responsible for the costs of upgrades or rearrangement to Duke Kentucky's facilities to accommodate a customer's desired change in installation. Provide any supporting documentation for the response.

RESPONSE:

- a. Any change or increase in installation that changes and/or requires upgrades to Company's service drops, transformers, meters, and other facilities to reliably serve the customer's new load.
- b. Duke Energy Kentucky facilities that may need to change or be relocated to accommodate a customer's desired change in installation might include, but are not limited to, a 3-phase service meter, a larger transformer, distribution feeder upgrades to increase capacity, and substation and transmission line upgrades to increase capacity.
- c. If the customer change in installation does not impact the distribution primary main line system, the Company currently doesn't require customer payment. If

the distribution primary main line system is impacted, the customer is responsible for the costs in excess of the 36 month revenue credit in accordance with the line extension policy.

PERSON RESPONSIBLE: Bruce L. Sailors

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-042

REQUEST:

Refer to Schedule L-2.2, page 39, Rider GTM, Generation Asset True Up Mechanism.
Explain why Rider GTM is being proposed at this time.

RESPONSE:

As explained in the Direct Testimony of Ms. Lawler, the Company is requesting approval of a placeholder rider as part of this proceeding to reconcile any remaining undepreciated plant balances following future retirements of its generating assets. Creating this rider now provides a mechanism to ensure that the customers pay no more or no less than the actual costs incurred by the Company for these assets. The Company believes that requesting this rider as part of this base rate case is administratively efficient and provides certainty to the Company as to the regulatory treatment of these assets upon retirement and reduces the balance sheet risk and impact of any significant undepreciated plant remaining at the time of unit retirement. As outlined in Ms. Lawler's testimony, the Company would not plan to populate the rider until the assets are retired. Also discussed in Ms. Lawler's direct testimony, the Company would file a separate application to implement the rider and that application would be subject to Commission determination of reasonableness. The Company would make necessary calculations in that proceeding to ensure that it does not over or double recover the remaining NBV of the assets in base rates.

PERSON RESPONSIBLE: Sarah E. Lawler

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-043

REQUEST:

Refer to Schedule L-2.2, page 45, Rate SL, Street Lighting Service. Explain why the time to replace burned out lamps is being revised from within 48 hours after notification by the customer to within three (3) business days after notification by the customer.

RESPONSE:

The Company is experiencing challenges to accurately respond in the 48 hour window due to labor challenges (i.e., vendors ability to recruit and retain labor resources). An extension of the time frame expectation will allow the Company to more accurately meet customer requests.

PERSON RESPONSIBLE: Bruce L. Sailors

REQUEST:

Refer to Schedule L-2.2, page 50, in which Duke Kentucky proposes to require a customer who is transferred from Rate SL to Rate LED due to their street lighting unit reaching the end of its life or becoming obsolete to enter into a new agreement within 90 days of being transferred to Rate LED.

- a. Explain why a new agreement would be required in such instances.
- b. Explain how Duke Kentucky will determine when a lighting unit or pole has reached the end of its life or has become obsolete.
- c. Explain how Duke Kentucky determined 90 days to be the appropriate time period.
- d. How many unique customers does Duke Kentucky provide service to under the Rate SL?
- e. Does Duke Kentucky enter into agreements to provide service under Rate SL for each individual fixture, or does a customer have multiple fixtures under the agreement

RESPONSE:

- a. The pricing and terms of service are not exactly the same between Rate LED and Rate SL.

b. Lighting manufacturers have sent notification to the Company notifying us of limited support for old lighting fixtures. As customer's notify the Company with repair requests, a determination of availability of parts and the possibility of repair can be made.

c. Ninety (90) days is selected as a manageable time frame to contact the customer and put a new agreement into place. Note that the Company intends to replace the fixture in the interim so that the customer maintains lighting service. However, the Company cannot continue to provide service without an agreement from the customer.

d. The Company serves 156 unique customers under Rate SL as of December 31, 2022.

e. Multiple fixtures can be included in a single agreement.

PERSON RESPONSIBLE: Bruce L. Sailors

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-045

REQUEST:

Refer to Schedule L-2.2, page 55, in which Duke Kentucky proposes to add language indicating that the monthly maintenance charge does not cover replacement of the fixture upon failure. Explain the reasoning for this change.

RESPONSE:

The additional language is for clarification only. The maintenance charge on Rate OL-E does not include recovery of costs to replace the fixture upon failure.

PERSON RESPONSIBLE: Bruce L. Sailors

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-046

REQUEST:

Refer to Schedule L-2.2, page 68, Rate LED, LED Outdoor Lighting Electric Service.

Provide cost support for the additional facilities charge of 0.8617 percent.

RESPONSE:

The additional facilities charge of 0.8617 percent is based on witness Sailers' testimony Attachment BLS-2 using a service life of 38.25 years and dividing the annual result of 10.34% by 12.

PERSON RESPONSIBLE: Bruce L. Sailers

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-047

REQUEST:

Refer to Schedule L-2.2, page 82, Rider X, Line Extension Policy.

- a. Explain why Duke Kentucky is proposing to revise its line extension policy to include material changes to a customer's installation.
- b. Explain what constitutes a material change to a customer's installation.
- c. Explain under what circumstances Duke Kentucky would determine that an early termination charge is not required.
- d. Provide the cite to the Federal Energy Regulatory Commission (FERC) rules regarding changes to or extension of transmission facilities, and explain when the distribution line extension policy will apply for such changes or extensions.
- e. Explain why the guarantee period is being revised from 5 to 10 years.

RESPONSE:

- a. Material changes to a customer's installation are similar to new customer load at a new location. Therefore, the Company proposes to process such requests the same.
- b. Any change or increase in installation that changes and/or requires upgrades to Company's service drops, transformers, meters, and other facilities to reliably serve the customer's new load.
- c. All applicable circumstances are not identified. However, an example of a situation that may justify exemption from an early termination charge could be where a

company site is sold to another company with little or no interruption in the level of service provided.

d. The Company clarifies that the rules referenced are not FERC rules but are part of the PJM tariff filed with FERC. The applicable citations are 1) PJM Tariff, Attachment M-3 (Additional Procedures for Planning Supplemental Projects and Asset Management Projects); 2) PJM Tariff, Attachment H-22 (Annual Transmission Rates – DEOK for Network Integration Transmission Service and Point-to-Point Transmission Service). The Company is unable to identify an example of when the distribution line extension policy would apply for such changes or extensions.

e. The guarantee period is being revised from 5 to up to 10 years to allow for additional commitment for customers requiring such an agreement. As the Company's capital investment is limited, the additional years provide an increased level of commitment from a customer requiring a large investment in infrastructure. The Company does not intend to use a guarantee period greater than 5 years except when the level of investment is large.

PERSON RESPONSIBLE: Bruce L. Sailors

REQUEST:

Refer to Schedule L-2.2, page 100, Rate EVSE, Electric Vehicle Service Equipment.

- a. Provide detailed cost support for the EVSE Extra Facilities charge of 2.7 percent per month of the estimated original installed cost for non-standard level 2 facilities.
- b. Provide detailed cost support for the EVSE Extra Facilities charge of 1.8 percent per month of the estimated original installed cost for non-standard DCFC extra facilities.
- c. Provide detailed cost support for the \$140 per hour after-hours service charge for EVSE maintenance.

RESPONSE:

- a. The EVSE Extra Facilities charge of 2.7 percent per month is calculated using witness Sailors' testimony Attachment BLS-2, Levelized Fixed Charge Rate, with a 4-year service life and then dividing the annual resulting value by 12.
- b. The EVSE Extra Facilities charge of 1.8 percent per month is calculated using witness Sailors' testimony Attachment BLS-2, Levelized Fixed Charge Rate, with a 7-year service life and then dividing the annual resulting value by 12.
- c. The \$140 per hour for after-hours service comes from labor market research that shows a licensed and experienced electrician labor rate is approximately \$110 per hour. Similarly, research shows that electrical contracting companies charge an additional 25-40% for overtime rates. The \$140/per hour rate has a 27% overtime rate adder.

Additionally, Duke Energy has negotiated this rate with program contractors in other jurisdictions.

PERSON RESPONSIBLE: Bruce L. Sailors – a., b.
Cormack C. Gordon – c.

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-049

REQUEST:

Refer to Schedule L-2.2, page 101, Rate EVSE, Electric Vehicle Service Equipment.

- a. Provide detailed cost support for the \$100 per removal/move fee for residential Level 2 EVSE.
- b. Provide detailed cost support for the \$165 per removal/move fee for non-residential Level 2 EVSE.

RESPONSE:

- a. The \$100 cost to remove/move a residential L2 charging station is based off the standard electrician rate of \$110 per hour (as explained in STAFF-DR-02-048) and the limited time it will take an electrician to remove a single residential L2 unit. This fee is intended to cover program costs for charger removal/relocation with penalizing the customer.
- b. The \$165 cost to remove/move a commercial L2 charging station is reflects the combined standard electrician with apprentice rate of \$180 per hour obtained from market research as well as the anticipated time it will take that contractor team to remove a single commercial L2 unit. This fee is intended to cover program costs for charger removal/relocation with penalizing the customer.

PERSON RESPONSIBLE: Cormack C. Gordon

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-050

REQUEST:

Refer to Schedule L-2.2, page 104, Rider DIR, Development Incentive Rider.

- a. Explain why the minimum load factor criterion is being reduced from 40 percent to 35 percent.
- b. Explain why the additional workforce criterion is being reduced from a minimum of 25 new jobs to a minimum of 10 new jobs.

RESPONSE:

- a. The primary reason for the minimum load factor change is to remain consistent and competitive with changes made to Duke Energy Ohio and Duke Energy Indiana economic development tariffs where the minimum criteria has been reduced to 250 hours use. Note that 250 hours use is consistent with a 35 percent load factor.
- b. Over the past several years, the Company has received multiple inquiries from crypto-currency mining companies. These companies have significant power requirements but do not have large employment requirements on site. Also, see the response to (a) above.

PERSON RESPONSIBLE: Bruce L. Sailors

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-051

REQUEST:

Refer to Schedule L-2.2, page 106, which indicates that Duke Kentucky will provide a monthly bill reduction to customers taking service under Rider DIR for a period of up to sixty (60) months. Also, refer to Schedule L-2.2, page 107, which indicates that customers taking service under Rider DIR must continue to take service from Duke Kentucky for a period of at least 2 years following the discount period. Finally, refer to the Commission's September 24, 1990 Order in Administrative Case No. 327,¹ finding number 14, which states in part that the term of an Economic Development Rate contract should be for a period twice the length of the discount period. Explain how Duke Kentucky's proposal complies with finding number 14 of the Commission's September 24, 1990 Order in Administrative Case No. 327.

RESPONSE:

The Company has added a "claw back" or "payback" criteria to the proposed Rider DIR which extends the economic development engagement to 10 years. The specific section in the tariff sheet being referenced is below.

- *If the Customer ceases the operations for which Rider DIR was originally approved, the Company will require that the Customer repay the Rider DIR*

¹ Administrative Case No. 327, *An Electronic Investigation into the Implementation of Economic Development Rates by Electric and Gas Utilities.*

reductions received according to the following schedule based on when the operations cease:

- *Years 1 to 5: 100%*
- *Year 6: 80%*
- *Year 7: 60%*
- *Year 8: 40%*
- *Year 9: 20%*
- *Year 10: 10%*

The payback criteria impact is that the customer only keeps the full discount provided if they continue the operation of the economic development load for 10 years; twice the length of the 5 year discount period.

PERSON RESPONSIBLE: Bruce L. Sailors

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-052

REQUEST:

Refer to Schedule L-2.2, page 115, in which Duke Kentucky adds language indicating that it may transfer RECs at the prevailing wholesale market prices to and from third parties, including affiliated companies. Explain the reasoning for this additional language.

RESPONSE:

The language is added for additional clarity and consistency. Today, the Company purchases the RECs at prevailing wholesale market prices from third parties, including affiliated companies. To date, the program has not had extra RECs to sell to third parties but would do so if the situation arises.

PERSON RESPONSIBLE: Bruce L. Sailors

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-053

REQUEST:

Refer to Schedule L-2.2, page 115, in which Duke Kentucky adds language stating that if a change to Rider GP reflects a decrease in pricing, no advance notice to the Public Service Commission is required.

- a. Explain when and how Duke Kentucky would provide notice to the Public Service Commission if there was a decrease in pricing to Rider GP.
- b. Confirm that Duke Kentucky would still provide 60 days advance notice to the Public Service Commission if it were to terminate Rider GP.

RESPONSE:

- a. The Company would provide notice to the Commission through a revised tariff sheet filing if the decrease occurs outside the Company's annual Rider GP filing. Typically, the Company would anticipate that a decrease would be implemented concurrent with an annual Rider GP filing. At a minimum, the annual filing would document the price decrease.
- b. Confirmed.

PERSON RESPONSIBLE: Bruce L. Sailors

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-054

REQUEST:

Refer to Schedule L-2.2, pages 150, sample bill format. Explain why the late payment charge is listed as 5 percent when Duke is proposing to reduce it to 2.3 percent in this proceeding.

RESPONSE:

This is an oversight on the bill format. The Company will amend this item upon Commission order in this proceeding approving the reduced 2.3 percent.

PERSON RESPONSIBLE: Bruce L. Sailors

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-055

REQUEST:

Refer to Schedule M, page 1 of 1, Revenues at Present and Proposed Rates for the Twelve Months Ended June 30, 2024.

a. Explain how Duke Kentucky arrived at the amount of \$43,500 and \$58,092 for the bad check charges and reconnection charges, respectively, for the revenue at present rates and provide any supporting documentation and calculations.

b. Explain whether any revenue from collection charges are included in this schedule. If so, provide the amount and explain how the amount was derived. Provide supporting documentation.

RESPONSE:

a. The total forecasted Miscellaneous Revenues in account 451100 of \$249,996 was forecasted based on historical averages. Since the revenues were forecasted in total and not by specific types of revenue, the total was allocated to various types of miscellaneous revenues using the actual revenue types in account 451100 from calendar year 2021. In 2021, bad check charges were 17.4% of the total and reconnection charges were 23.24% of the total. The allocated portion of the forecasted miscellaneous revenues for bad check charge is $\$249,996 * 17.4\% = \$43,500$. The allocated portion of the forecasted miscellaneous revenues for reconnection charges is $\$249,996 * 23.24\% = \$58,092$. Rounding deviations can result in slight differences in the final values.

b. Assuming that collection charges are referring to late payment charges, there are no late payment charge revenues included in this schedule. For additional information, see the Company's response to STAFF-02-010(b).

PERSON RESPONSIBLE: Grady "Tripp" Carpenter/Lisa D. Steinkuhl – a.
Bruce L. Sailors – b.

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-056

REQUEST:

Refer to Duke Kentucky’s Response to Staff First Request, Item 56, STAFF-DR-01-056_Attachment_-_KPSC_Elec_SFRs_-_2022.xlsx at tab “WPB-6’s.” Refer also to the Direct Testimony of John R. Panizza (Panizza Direct Testimony) at pages 4–6.

a. Explain, in detail, how Duke Kentucky calculated the amortization of electric “protected EDIT” using the Average Rate Assumption Method (ARAM) during the base and forecasted periods including: (1) when it last calculated the amortization using ARAM based on actual, historical numbers; (2) how it projected the ARAM amortization into the forecasted period; and (3) how it projected any changes to the ARAM amortization during the forecasted period.

b. Provide the actual balance of electric “protected EDIT” as of March 31, 2020, and as of the end of each month, thereafter, through March 31, 2021 calculated using actual, historical information regarding Duke Kentucky’s plant and timing differences.

c. Provide the maximum amortization of electric “protected EDIT” allowed using ARAM in each month from April 2020 through March 2021 calculated using actual, historical information regarding Duke Kentucky’s plant and timing differences.

d. Provide the actual balance of electric “unprotected EDIT” as of March 31, 2020.

e. Provide the sum of the amortization of unprotected and protected electric EDIT in each month of the forecasted period in Case No. 2019-00271¹ as used to calculate the revenue requirement in that case.

RESPONSE:

a. Duke Energy Kentucky used PowerTax to calculate the protected ARAM. Forecasted book depreciation and tax depreciation were input into PowerTax in order to calculate ARAM for the forecasted period. Forecasted book and tax depreciation is only needed for historical assets prior to 1/1/2018 as ARAM is only calculated for assets which existed prior to the tax rate change. PowerTax does the calculation for each year. ARAM starts on a given asset in the system when book depreciation exceeds tax depreciation. ARAM stops for a given asset once the asset is fully depreciated for both book and tax. Therefore, each year the ARAM amount will be different as some assets start ARAM and some assets drop off ARAM.

b. Please see STAFF-DR-02-056 Attachment.

c. Please see STAFF-DR-02-056 Attachment.

d. Please see STAFF-DR-02-056 Attachment.

e. Please see STAFF-DR-02-056 Attachment.

PERSON RESPONSIBLE: John R. Panizza

¹ Case No. 2019-00271, *Electric Application of Duke Energy Kentucky, Inc. for 1) an Adjustment of the Electric Rates; 2) Approval of New Tariffs; 3) Approval of Accounting Practices to Establish Regulatory Assets and Liabilities; and 4) All Other Required Approvals and Relief* (Ky. PSC Apr. 27, 2020), final Order.

DE Kentucky - Electric
 Federal EDIT Workpaper

EDIT:	Protected to		Unprotected PP&E	Unprotected Non PP&E
	Protected	Unprotected		
Estimate As of 12/31/2017	(35,298,360)	(367,668)	(29,180,237)	(3,466,986)
2018 Return True Up	(2,879,815)	(29,996)	-	20,162
2018 PP&E True Up	(9,637,532)	(100,385)	7,205,565	-
Protected to unprotected mvm	146,320	351,728	(146,320)	(21,974,672)
Total EDIT To Be Amortized	(47,815,707)	(146,320)	(21,974,672)	(3,446,824)

Balances Used to Compute 10-yr Amortization	Beginning in 2019	(29,565,800)	(3,466,986)
	Per Month Amount	(246,382)	(28,892)

Cumulative Balances

	Protected EDIT		Amortization Of		Amortization Of		MTD EDIT	YTD EDIT	Protected	Unprotected PP&E	Unprotected Non PP&E	Total
	Amortization	ARAM Rate	Unprotected PP&E	Unprotected Non PP&E	Amortization	Amortization						
Jan-18	36,580		-	(36,580)	-	-	-	-	(47,779,127)	(21,974,672)	(3,483,404)	(73,237,203)
Feb-18	36,580		-	(36,580)	-	-	-	-	(47,742,547)	(21,974,672)	(3,519,984)	(73,237,203)
Mar-18	36,580		-	(36,580)	-	-	-	-	(47,705,967)	(21,974,672)	(3,556,564)	(73,237,203)
Apr-18	36,580		-	(36,580)	-	-	-	-	(47,669,387)	(21,974,672)	(3,593,145)	(73,237,203)
May-18	91,917	3.12%	246,233	28,892	367,041	367,041	367,041	367,041	(47,577,470)	(21,728,439)	(3,564,253)	(72,870,162)
Jun-18	91,917	3.12%	246,233	28,892	367,041	734,082	367,041	734,082	(47,485,553)	(21,482,207)	(3,535,361)	(72,503,121)
Jul-18	91,917	3.12%	246,233	28,892	367,041	1,101,123	367,041	1,101,123	(47,393,636)	(21,235,974)	(3,506,470)	(72,136,080)
Aug-18	91,917	3.12%	246,233	28,892	367,041	1,468,164	367,041	1,468,164	(47,301,719)	(20,989,742)	(3,477,578)	(71,769,039)
Sep-18	99,416	3.12%	246,483	28,724	374,622	1,842,786	374,622	1,842,786	(47,202,303)	(20,743,259)	(3,448,855)	(71,394,417)
Oct-18	99,416	3.12%	246,483	28,724	374,622	2,217,408	374,622	2,217,408	(47,102,887)	(20,496,777)	(3,420,131)	(71,019,795)
Nov-18	99,416	3.12%	246,483	28,724	374,622	2,592,030	374,622	2,592,030	(47,003,471)	(20,250,294)	(3,391,408)	(70,645,173)
Dec-18	(373,274)		247,348	28,724	(97,203)	2,494,827	(97,203)	2,494,827	(47,376,745)	(20,002,947)	(3,362,684)	(70,742,376)
Balance	(47,376,745)		(49,815,128)		(6,858,562)							
Jan-19									(47,376,745)	(20,002,947)	(3,362,684)	(70,742,376)
Feb-19	73,160		492,763	57,783	623,707	623,707	623,707	623,707	(47,303,585)	(19,510,183)	(3,304,901)	(70,118,669)
Mar-19	36,580		246,382	28,892	311,853	935,560	311,853	935,560	(47,267,005)	(19,263,802)	(3,276,010)	(69,806,816)
Apr-19	36,580		246,382	28,892	311,853	1,247,413	311,853	1,247,413	(47,230,425)	(19,017,420)	(3,247,118)	(69,494,963)
May-19	36,580		246,382	28,892	311,853	1,559,267	311,853	1,559,267	(47,193,845)	(18,771,038)	(3,218,226)	(69,183,109)
Jun-19	36,580		246,382	28,892	311,853	1,871,120	311,853	1,871,120	(47,157,264)	(18,524,657)	(3,189,335)	(68,871,256)
Jul-19	36,580		246,382	28,892	311,853	2,182,973	311,853	2,182,973	(47,120,684)	(18,278,275)	(3,160,443)	(68,559,403)
Aug-19	36,580		246,382	28,892	311,853	2,494,826	311,853	2,494,826	(47,084,104)	(18,031,893)	(3,131,552)	(68,247,550)
Sep-19	36,580		246,382	28,892	311,853	2,806,680	311,853	2,806,680	(47,047,524)	(17,785,512)	(3,102,660)	(67,935,696)
Oct-19	36,580		246,382	28,892	311,853	3,118,533	311,853	3,118,533	(47,010,944)	(17,539,130)	(3,073,769)	(67,623,843)
2018 True ups (Booked in Nov. 19 - RTP Dataset)	145,446			(48,482)	96,964	3,215,497	96,964	3,215,497	(46,865,498)	(17,539,130)	(3,122,251)	(67,526,879)
Nov-19	169,907		246,382	28,892	445,180	3,660,677	445,180	3,660,677	(46,695,591)	(17,292,748)	(3,093,359)	(67,081,699)
Dec-19	48,701		246,382	28,892	323,974	3,984,651	323,974	3,984,651	(46,646,890)	(17,046,367)	(3,064,468)	(66,757,725)
Balance	(46,646,890)		(46,858,548)		(6,560,345)							
Jan-20	48,701		246,382	28,892	323,974	323,974	323,974	323,974	(46,598,190)	(16,799,985)	(3,035,576)	(66,433,751)
Feb-20	48,701		246,382	28,892	323,974	647,948	323,974	647,948	(46,549,489)	(16,553,603)	(3,006,685)	(66,109,777)
Mar-20	48,701		246,382	28,892	323,974	971,922	323,974	971,922	(46,500,788) Part b.	(16,307,222) Part d.	(2,977,793)	(65,785,803)
Apr-20	48,701	Part c.	246,382	28,892	323,974	1,295,896	323,974	1,295,896	(46,452,088)	(16,060,840)	(2,948,901)	(65,461,829)
May-20	48,701	Part c.	246,382	28,892	323,974	1,619,869	323,974	1,619,869	(46,403,387)	(15,814,458)	(2,920,010)	(65,137,855)
Jun-20	48,701	Part c.	246,382	28,892	323,974	1,943,843	323,974	1,943,843	(46,354,686)	(15,568,077)	(2,891,118)	(64,813,881)
Jul-20	48,701	Part c.	246,382	28,892	323,974	2,267,817	323,974	2,267,817	(46,305,986)	(15,321,695)	(2,862,227)	(64,489,908)
Aug-20	48,701	Part c.	246,382	28,892	323,974	2,591,791	323,974	2,591,791	(46,257,285)	(15,075,313)	(2,833,335)	(64,165,934)
Sep-20	48,701	Part c.	246,382	28,892	323,974	2,915,765	323,974	2,915,765	(46,208,584)	(14,828,932)	(2,804,444)	(63,841,960)
Oct-20	48,701	Part c.	246,382	28,892	323,974	3,239,739	323,974	3,239,739	(46,159,884)	(14,582,550)	(2,775,552)	(63,517,986)
Nov-20	48,701	Part c.	246,382	28,892	323,974	3,563,713	323,974	3,563,713	(46,111,183)	(14,336,168)	(2,746,661)	(63,194,012)
2019 ARAM True ups booked in RTP dataset	(560,965)	Part c.	-	-	(560,965)	3,002,747	(560,965)	3,002,747	(46,672,148)	(14,089,787)	(2,717,769)	(63,479,704)
2020 EDIT Estimate Adj. included - 12/1/2020	64,293	Part c.	246,382	28,892	339,566	3,342,313	339,566	3,342,313	(46,607,856)	(14,089,787)	(2,717,769)	(63,415,412)
Balance	(46,607,856)		(43,901,968)		(6,213,647)							
Jan-21	50,000	Part c.	246,382	28,892	325,273	325,273	325,273	325,273	(46,557,856)	(13,843,405)	(2,688,877)	(63,090,138)
Feb-21	50,000	Part c.	246,382	28,892	325,273	650,546	325,273	650,546	(46,507,856)	(13,597,023)	(2,659,986)	(62,764,865)
Mar-21	50,000	Part c.	246,382	28,892	325,273	975,820	325,273	975,820	(46,457,856)	(13,350,642)	(2,631,094)	(62,439,592)
Apr-21	50,000		246,382	28,892	325,273	1,301,093	325,273	1,301,093	(46,407,856)	(13,104,260)	(2,602,203)	(62,114,319)
May-21	50,000		246,382	28,892	325,273	1,626,366	325,273	1,626,366	(46,357,856)	(12,857,878)	(2,573,311)	(61,789,046)
Jun-21	50,000		246,382	28,892	325,273	1,951,639	325,273	1,951,639	(46,307,856)	(12,611,497)	(2,544,420)	(61,463,772)
Jul-21	50,000		246,382	28,892	325,273	2,276,913	325,273	2,276,913	(46,257,856)	(12,365,115)	(2,515,528)	(61,138,499)
Aug-21	50,000		246,382	28,892	325,273	2,602,186	325,273	2,602,186	(46,207,856)	(12,118,733)	(2,486,637)	(60,813,226)
Sep-21	50,000		246,382	28,892	325,273	2,927,459	325,273	2,927,459	(46,157,856)	(11,872,352)	(2,457,745)	(60,487,953)
Oct-21	50,000		246,382	28,892	325,273	3,252,732	325,273	3,252,732	(46,107,856)	(11,625,970)	(2,428,854)	(60,162,680)
Nov-21	50,000		246,382	28,892	325,273	3,578,005	325,273	3,578,005	(46,057,856)	(11,379,588)	(2,399,962)	(59,837,406)
2020 ARAM True ups booked in RTP dataset	173,889		-	-	173,889	3,751,895	173,889	3,751,895	(45,883,967)	(11,379,588)	(2,399,962)	(59,663,517)
2020 EDIT True Up KY Rate Case Change	(41,568)		-	-	(41,568)	3,710,327	(41,568)	3,710,327	(45,925,535)	(11,379,588)	(2,399,962)	(59,705,085)
2021 EDIT Estimate Adj. included	204,160		246,382	28,892	479,433	4,189,760	479,433	4,189,760	(45,721,375)	(11,133,207)	(2,371,070)	(59,225,652)
Balance	(45,721,375)		(40,945,388)		(5,866,948)							
Jan-22	81,670		246,382	28,892	356,943	356,943	356,943	356,943	(45,639,705)	(10,886,825)	(2,342,179)	(58,868,709)
Feb-22	81,670		246,382	28,892	356,943	713,885	356,943	713,885	(45,558,036)	(10,640,443)	(2,313,287)	(58,511,766)
Mar-22	81,670		246,382	28,892	356,943	1,070,828	356,943	1,070,828	(45,476,366)	(10,394,062)	(2,284,396)	(58,154,824)
Apr-22	81,670		246,382	28,892	356,943	1,427,771	356,943	1,427,771	(45,394,697)	(10,147,680)	(2,255,504)	(57,797,881)
May-22	81,670		246,382	28,892	356,943	1,784,714	356,943	1,784,714	(45,313,027)	(9,901,298)	(2,226,613)	(57,440,938)
Jun-22	81,670		246,382	28,892	356,943	2,141,656	356,943	2,141,656	(45,231,358)	(9,654,917)	(2,197,721)	(57,083,995)

DE Kentucky - Electric
 Federal EDIT Workpaper

EDIT:	Protected to Unprotected		Unprotected PP&E	Unprotected Non PP&E
	Protected	Mvmt		
Estimate As Of 12/31/2017	(35,298,360)	(367,668)	(29,180,237)	(3,466,986)
2018 Return True Up	(2,879,815)	(29,996)	-	20,162
2018 PP&E True Up	(9,637,532)	(100,385)	7,205,565	-
Protected to unprotected mvmt	146,320	351,728	(146,320)	(21,974,672)
Total EDIT To Be Amortized	(47,815,707)	(146,320)	(21,974,672)	(3,446,824)

Balances Used to Compute 10-yr Amortization	Beginning in 2019 Per Month Amount	(29,565,800)	(3,466,986)
		(246,382)	(28,892)

Cumulative Balances

	Protected EDIT Amortization	ARAM Rate	Amortization Of		MTD EDIT	YTD EDIT Amortization	Protected	Unprotected PP&E	Unprotected Non PP&E	Total
			Unprotected PP&E EDIT \$3.303M Annual	Unprotected Non PP&E \$3.303M Annual						
Jul-22	81,670		246,382	28,892	356,943	2,498,599	(45,149,688)	(9,408,535)	(2,168,830)	(56,727,053)
Aug-22	81,670		246,382	28,892	356,943	2,855,542	(45,068,019)	(9,162,153)	(2,139,938)	(56,370,110)
Sep-22	81,670		246,382	28,892	356,943	3,212,485	(44,986,349)	(8,915,772)	(2,111,046)	(56,013,167)
Oct-22	81,670		246,382	28,892	356,943	3,569,427	(44,904,680)	(8,669,390)	(2,082,155)	(55,656,225)
Nov-22	81,670		246,382	28,892	356,943	3,926,370	(44,823,010)	(8,423,008)	(2,053,263)	(55,299,282)
Dec-22	81,670		246,382	28,892	356,943	4,283,313	(44,741,341)	(8,176,627)	(2,024,372)	(54,942,339)
Balance	(44,741,341)		(37,988,808)	(5,520,249)						
Jan-23	98,238		246,382	28,892	373,511	373,511	(44,643,103)	(7,930,245)	(1,995,480)	(53,568,828)
Feb-23	98,238		246,382	28,892	373,511	747,022	(44,544,865)	(7,683,863)	(1,966,589)	(53,195,317)
Mar-23	98,238		246,382	28,892	373,511	1,120,533	(44,446,627)	(7,437,482)	(1,937,697)	(52,821,816)
Apr-23	98,238		246,382	28,892	373,511	1,494,044	(44,348,390)	(7,191,100)	(1,908,806)	(52,448,315)
May-23	98,238		246,382	28,892	373,511	1,867,555	(44,250,152)	(6,944,718)	(1,879,914)	(52,074,814)
Jun-23	98,238		246,382	28,892	373,511	2,241,066	(44,151,914)	(6,698,337)	(1,851,023)	(51,701,313)
Jul-23	98,238		246,382	28,892	373,511	2,614,577	(44,053,676)	(6,451,955)	(1,822,131)	(51,327,812)
Aug-23	98,238		246,382	28,892	373,511	2,988,088	(43,955,439)	(6,205,573)	(1,793,239)	(50,954,311)
Sep-23	98,238		246,382	28,892	373,511	3,361,599	(43,857,201)	(5,959,192)	(1,764,348)	(50,580,810)
Oct-23	98,238		246,382	28,892	373,511	3,735,110	(43,758,963)	(5,712,810)	(1,735,456)	(50,207,309)
Nov-23	98,238		246,382	28,892	373,511	4,108,621	(43,660,725)	(5,466,428)	(1,706,565)	(49,833,808)
Dec-23	98,238		246,382	28,892	373,511	4,482,132	(43,562,487)	(5,220,047)	(1,677,673)	(49,460,307)
Balance	(43,562,487)	-	(35,032,228)	(5,173,551)						
Jan-24	123,341		246,382	28,892	398,614	398,614	(43,439,146.52)	(4,973,665.15)	(1,648,781.66)	(49,061,593.33)
Feb-24	123,341		246,382	28,892	398,614	797,228	(43,315,805.54)	(4,727,283.48)	(1,619,890.11)	(48,652,989.13)
Mar-24	123,341		246,382	28,892	398,614	1,195,843	(43,192,464.57)	(4,480,901.81)	(1,590,998.56)	(48,244,864.94)
Apr-24	123,341		246,382	28,892	398,614	1,594,457	(43,069,123.60)	(4,234,520.15)	(1,562,107.01)	(47,837,750.76)
May-24	123,341		246,382	28,892	398,614	1,993,071	(42,945,782.62)	(3,988,138.48)	(1,533,215.46)	(47,431,136.56)
Jun-24	123,341		246,382	28,892	398,614	2,391,685	(42,822,441.65)	(3,741,756.81)	(1,504,323.91)	(47,025,521.37)
Balance	(42,822,442)	-	(33,553,938)	(5,000,201)						

	Protected	Unprotected PP&E	Unprotected Non PP&E	Total
Amount - March 2022 to August 2022	490,017	1,478,290	173,349	2,141,656
Amount - September 2022 to February 2023	523,154	1,478,290	173,349	2,174,793
Total Base Period	1,013,171	2,956,580	346,699	4,316,449
Amount - July 2023-June 2024	1,329,472	2,956,580	346,699	4,632,751
Total Test Period	1,329,472	2,956,580	346,699	4,632,751

To Sch E-1

To Sch E-1

Note: Protected ARAM amortization amounts were updated for 2023-2024 due to depreciation study being implemented in this rate case.

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-057

REQUEST:

Refer to the Commission’s December 28, 2021 Order in Case No. 2021-00190¹, ordering paragraph 17, in which the Commission ordered the following: “Duke Kentucky shall make revisions to its billing system to allocate the reconnection fees of combination electric and gas customers in accordance with each tariff.” Explain whether Duke Kentucky has made the necessary revisions to its billing system to properly allocate reconnection fees of combination electric and gas customers. If so, explain the revisions that have been made. If not, explain why not.

RESPONSE:

Duke Energy Kentucky transitioned to its new billing system in April 2022. The issue regarding Duke Energy Kentucky fees being equally split for electric and gas has been resolved. If a customer is being reconnected, Duke Energy Kentucky will charge a reconnection fee for the corresponding service that was disconnected.

PERSON RESPONSIBLE: Retha I. Hunsicker

¹ Case No. 2021-00190, *Electronic Application of Duke Energy Kentucky, Inc. for: 1) An Adjustment of the Natural Gas Rates; 2) Approval of New Tariffs, and 3) All Other Required Approvals, Waivers, and Relief* (Ky. PSC Dec. 28, 2021).

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-058

REQUEST:

Refer to Commission Case No. 2017-00321¹ and 2019-00271². In both of Duke Kentucky's last two rate cases, an updated depreciation study was completed that supported the proposal of new depreciable lives for Duke Kentucky's assets. Confirm if Duke Kentucky's practice will be to complete a depreciation study prior to each base rate case that will take place prior to the retirement of the East Bend and Woodsdale generation facilities.

RESPONSE:

Although the Company cannot predict what it will do in a future base rate case proceeding, it will likely be the practice to prepare updated depreciation studies in any future base rate case proceeding.

PERSON RESPONSIBLE: Sarah E. Lawler

¹ Case No. 2017-00321 *Electronic Application of Duke Energy Kentucky, Inc. for: 1) An Adjustment of the Electric Rates; 2) Approval of an Environmental Compliance Plan and Surcharge Mechanism; 3) Approval of New Tariffs; 4) Approval of Accounting Practices to Establish Regulatory Assets and Liabilities; and 5) All Other Required Approvals and Relief* (Ky. PSC Apr. 13, 2018).

² Case No. 2019-00271, *Electric Application of Duke Energy Kentucky, Inc. for 1) an Adjustment of the Electric Rates; 2) Approval of New Tariffs; 3) Approval of Accounting Practices to Establish Regulatory Assets and Liabilities; and 4) All Other Required Approvals and Relief* (Ky. PSC Apr. 27, 2020).

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-059

REQUEST:

Refer to the Direct Testimony of John Spanos (Spanos Direct Testimony), Attachment JJS-1, 2021 Depreciation Study, page 7. Provide a comparison of the current depreciation rates and the proposed depreciation rates.

RESPONSE:

Please see STAFF-DR-02-059 Attachment which sets forth the currently approved depreciation rates and the proposed depreciation rates from the 2021 Depreciation Study.

PERSON RESPONSIBLE: John J. Spanos

DUKE ENERGY KENTUCKY
COMPARISON OF PROPOSED AND EXISTING DEPRECIATION RATES
RELATED TO ELECTRIC AND COMMON PLANT AS OF DECEMBER 31, 2021

ACCOUNT (1)	PROPOSED ANNUAL ACCRUAL RATE (2)	EXISTING ANNUAL ACCRUAL RATE (3)
COMMON PLANT		
1900 STRUCTURES AND IMPROVEMENTS		
ERLANGER OPERATIONS CENTER	2.83	0.97
KENTUCKY SERVICE BUILDING - 19TH AND AUGUSTINE	5.39	0.41
MINOR STRUCTURES	2.57	2.14
1910 OFFICE FURNITURE AND EQUIPMENT	5.00	5.00
1911 ELECTRONIC DATA PROCESSING	10.01	20.00
1940 TOOLS, SHOP AND GARAGE EQUIPMENT	4.00	4.00
1970 COMMUNICATION EQUIPMENT	6.67	6.67
1980 MISCELLANEOUS EQUIPMENT	6.67	6.67
STEAM PRODUCTION PLANT		
3110 STRUCTURES AND IMPROVEMENTS	6.30	2.47
3120 BOILER PLANT EQUIPMENT	4.33	2.24
3123 BOILER PLANT EQUIPMENT - SCR CATALYST	5.91	4.56
3140 TURBOGENERATOR UNITS	4.53	2.36
3150 ACCESSORY ELECTRIC EQUIPMENT	2.99	2.24
3160 MISCELLANEOUS POWER PLANT EQUIPMENT	4.88	3.17
OTHER PRODUCTION PLANT		
3410 STRUCTURES AND IMPROVEMENTS	1.77	2.52
3420 FUEL HOLDERS, PRODUCERS AND ACCESSORIES	5.46	2.13
3430 PRIME MOVERS	6.14	N/A
3440 GENERATORS	2.83	3.36
3446 GENERATORS - SOLAR		
CRITTENDEN	5.17	4.72 *
WALTON	5.17	4.72 *
3450 ACCESSORY ELECTRIC EQUIPMENT	3.23	3.82
3456 ACCESSORY ELECTRIC EQUIPMENT - SOLAR		
CRITTENDEN	5.46	4.44 *
WALTON	5.46	4.44 *
3460 MISCELLANEOUS POWER PLANT EQUIPMENT	2.62	3.71
TRANSMISSION PLANT		
3501 RIGHTS OF WAY	0.93	1.27
3520 STRUCTURES AND IMPROVEMENTS	1.69	1.96
3530 STATION EQUIPMENT	2.31	2.16
3531 STATION EQUIPMENT - STEP UP	2.52	2.05
3532 STATION EQUIPMENT - MAJOR	1.78	1.73
3534 STATION EQUIPMENT - STEP UP EQUIPMENT	2.87	4.13
3550 POLES AND FIXTURES	2.57	1.76
3560 OVERHEAD CONDUCTORS AND DEVICES	2.09	1.91
3561 OVERHEAD CONDUCTORS AND DEVICES - CLEARING AND RIGHT OF WAY	1.54	1.74
DISTRIBUTION PLANT		
3601 RIGHTS OF WAY	0.69	1.03
3610 STRUCTURES AND IMPROVEMENTS	1.88	2.26
3620 STATION EQUIPMENT	3.91	2.35
3622 STATION EQUIPMENT - MAJOR	1.73	1.59
3640 POLES, TOWERS AND FIXTURES	2.38	2.09
3650 OVERHEAD CONDUCTORS AND DEVICES	2.51	2.14
3651 OVERHEAD CONDUCTORS AND DEVICES - CLEARING AND RIGHT OF WAY	1.50	1.65
3660 UNDERGROUND CONDUIT	1.60	1.80
3670 UNDERGROUND CONDUCTORS AND DEVICES	2.53	2.07
3680 LINE TRANSFORMERS	2.03	1.68
3682 LINE TRANSFORMERS - CUSTOMER	0.53	0.31
3691 SERVICES - UNDERGROUND	1.97	1.87
3692 SERVICES - OVERHEAD	1.70	1.21
3700 METERS AND METERING EQUIPMENT	4.60	6.32
3702 UoF METERS	6.12	6.85
3711 INSTALLATIONS ON CUSTOMERS' PREMISES - AREA LIGHTING	4.57	N/A
3712 COMPANY-OWNED OUTDOOR LIGHTING	10.78	5.26
3720 LEASED PROPERTY ON CUSTOMERS' PREMISES	-	-
3731 STREET LIGHTING - OVERHEAD	1.25	0.73
3732 STREET LIGHTING - BOULEVARD	1.12	1.18
3733 STREET LIGHTING - CUSTOMER POLES	4.21	2.67
GENERAL PLANT		
3900 STRUCTURES AND IMPROVEMENTS	3.33	3.40
3910 OFFICE FURNITURE AND EQUIPMENT	5.00	5.00
3911 ELECTRONIC DATA PROCESSING	20.00	20.00
3920 TRANSPORTATION EQUIPMENT	6.20	8.56
3921 TRANSPORTATION EQUIPMENT - TRAILERS	1.93	3.84
3940 TOOLS, SHOP AND GARAGE EQUIPMENT	4.00	4.00
3960 POWER OPERATED EQUIPMENT	4.18	6.74
3970 COMMUNICATION EQUIPMENT	6.67	6.67

N/A = NOT APPLICABLE

* THESE RATES WERE FOOTNOTED IN THE FILING, SINCE THE ASSETS WERE NOT YET IN SERVICE AT THE TIME OF THE DEPRECIATION STUDY.

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-060

REQUEST:

Refer to the Lawler Direct Testimony, page 19. Duke Kentucky supports its proposal for the GTM Rider by citing the Decommissioning Rider (DR) in Commission Case No. 2012-00578 and the Retired Asset Recovery Rider (RAR) in Commission Case No. 2020-00349 & 2020-00350. List the dates the riders in each case were approved in relation to the actual retirement date for each asset.

RESPONSE:

Case No. 2012-00578 was filed on December 19, 2012 and the Commission issued an order on October 17, 2013 in that proceeding. The Company is not aware of the exact retirement dates of the assets included in this proceeding but believes it was sometime in 2015.

- Case Nos. 2020-00349 and 2020-00350 were filed on November 25, 2020 and the Commission issued an order in that proceeding on June 30, 2021. The generating assets related to that proceeding have not been retired as of the date of this response. However, LG&E/KU company witness Lonnie E. Bellar listed the following retirement dates in his testimony in that proceeding:

- Brown 3: 2028
- Mill Creek 1: 2024
- Mill Creek 2: 2028

PERSON RESPONSIBLE: Sarah E. Lawler

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-061

REQUEST:

Refer broadly to the regulatory assets requested by Duke Kentucky in the current proceeding. In each program, Duke Kentucky proposes to record expenses associated with each program to be included in base rates in a future proceeding. Explain why Duke Kentucky should not also establish a regulatory liability to record revenue associated with each program to avoid asymmetrical recovery.

RESPONSE:

Please see response to STAFF-DR-02-001.

PERSON RESPONSIBLE: Sarah E. Lawler

REQUEST:

Refer to the Direct Testimony of Max W. McClellan (McClellan Direct Testimony), page 11.

a. Explain whether Duke Kentucky analyzed the impact of periods other than 30 years to calculate the Normal Weather in its electric load forecast. If so, provide this impact. If not, explain why no other weather periods were considered.

b. Explain whether any Duke Kentucky affiliate makes forecasts using a period other than 30 years and using a different normal weather calculation methodology. If so, explain the other Duke Kentucky affiliate normal weather methodologies.

c. Provide a list and summary of any of Duke Kentucky's affiliates who use periods other than 30 years for weather normalization.

RESPONSE:

a. Duke Energy Kentucky only prepares a forecast for the 30-year weather normal. While we are aware that some other utilities use shorter normal periods—the twenty-year normal is popular—we have concerns about the extent to which normal weather can vary year-by-year as old years are rolled off and replaced by new year's. Having a three-times larger sample size means that the standard errors of estimates for weather are reduced by approximately 70%.

b. No other Duke Energy Kentucky affiliates use a period different than the 30-year period.

c. N/A.

PERSON RESPONSIBLE: Max W. McClellan

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-063

REQUEST:

Refer to Duke Kentucky's response to Staff's First Request, Item 39. Provide, as separately stated totals, the total employer contributions to 401(k) expenses and for defined benefits plans for the forecasted test period. In addition to stated totals, provide this information detailing the total contributions for union and non-union employees.

RESPONSE:

See below for total employer 401(k) match expense and defined benefit expense for the forecasted test period (7/1/23 – 6/30/24) for Duke Energy Kentucky Electric. We are unable to break down amounts by union/non-union as dollars are not budgeted by employee type.

- Employer 401(k) matching contributions: \$822,140
- Employer 401(k) contributions: \$266,638
- Defined benefits: \$275,239

PERSON RESPONSIBLE: Jacob J. Stewart

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-064

REQUEST:

Refer to the Direct Testimony of Jake J. Stewart (Stewart Direct Testimony), pages 6-7.

a. Provide the annual number of employees per year since 2016 that Duke Kentucky has lost to other electric/natural gas companies and contractors.

b. Provide the number of executives per year since 2016 that Duke Kentucky has lost to other electric/natural gas companies and contractors.

RESPONSE:

The Company does not formally capture where an employee is going to work upon resignation. However, leadership has shared feedback from employees that cite higher pay, more favorable benefits, and career opportunities as common reasons for resigning for other employment.

PERSON RESPONSIBLE: Jacob J. Stewart

Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023

STAFF-DR-02-065

REQUEST:

Refer to Stewart Direct Testimony, pages 14–16, and Table 1.

- a. Provide the total amount paid for each short-term incentive (STI) plan component for 2021.
- b. Provide the total amount forecasted to be paid out for each STI plan component in the forecasted test year.

RESPONSE:

- a. Payout of Short-term Incentive recorded in March 2022 for the 2021 STI plan year for employees of Duke Energy Kentucky for each STI plan component:

EPS	\$ 276,172
O&M	\$ 27,617
Operational Excellence	\$ 55,234
Customer Satisfaction (CSAT)	\$ 55,234
Team	<u>\$ 138,086</u>
Total	<u>\$ 552,344</u>

The 2021 STI expensed on Duke Energy Kentucky electric for all employees including employees of affiliates directly charging or allocating their time to Duke Energy Kentucky electric excluding the EPS measure is \$1,868,036. See the table below for the STI plan components and the calculation.

Plan Measure	Total to	Non-Utility	Exclude	2021
	DE Kentucky	Accounts	EPS	STI Plan Component
EPS	\$ 1,925,064	\$ (57,028)	\$(1,868,036.41)	\$ -
O&M	192,506	(5,703)		186,804
Operational Excellence	385,013	(11,406)		373,607
Customer Satisfaction (CSAT)	385,013	(11,406)		373,607
Team	962,532	(28,514)		934,018
Total	\$ 3,850,129	\$ (114,057)	\$ (1,868,036)	\$ 1,868,036
Non-Utility Accounts O&M accounts including eliminations on D-2.22	\$ 114,057	2.9624%		
Accounts 500-935 (Income Statement) excluding eliminations on D-2.22	3,736,071	97.0376%		
	\$ 3,850,129	100.0000%		

b. \$1,221,336 is included in the forecasted test year to be paid out for the STI plan. See the table below for STI plan components and the calculation.

Plan Measure	Total to	Non-Utility	Excluded on	Forecasted Test Year
	DE Kentucky	Accounts	WPD-2.28a	STI Plan Component
EPS	\$ 1,270,035	\$ (48,699)	\$(1,221,336)	\$ -
O&M	127,003	(4,870)		122,133
Operational Excellence	254,008	(9,740)		244,268
Customer Satisfaction (CSAT)	254,008	(9,740)		244,268
Team	635,017	(24,350)		610,667
Total	\$ 2,540,071	\$ (97,399)	\$(1,221,336)	\$ 1,221,336
Non-Utility O&M accounts including eliminations on D-2.22	\$ 97,399	3.8345%		
Accounts 500-935 (Income Statement) excluding eliminations on D-2.22	2,442,672	96.1655%		
	\$ 2,540,071	100.0000%		

PERSON RESPONSIBLE: Jacob J. Stewart – a.
Lisa D. Steinkuhl – b.

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-066

REQUEST:

Refer to Stewart Direct Testimony, pages 23–25.

a. For the forecasted test period, provide the long term incentive (LTI) amount included for the Executive LTI program.

b. For the forecasted test period, provide the LTI amount included for the Restricted Stock Units.

RESPONSE:

a. \$90,193 is included in the forecasted test year to be paid out for the LTI plan. See the table below for LTI plan components and the calculation.

Plan Measure	Total to DE Kentucky	Non-Utility Accounts	Excluded on WPD-2.28a	Forecasted Test Year LTI Plan Component
EPS	\$ 188,696	\$ (8,310)	\$ (180,386)	\$ -
Total Shareholder Return (TSR)	94,348	(4,155)	(90,193)	-
TICR (Safety metric)	94,348	(4,155)		90,193
ROE	-	-		-
Total	377,392	(16,620)	(270,579)	90,193
Non-Utility Accounts O&M accounts including eliminations on D-2.22	\$ 16,620	4.4039%		
Accounts 500-935 (Income Statement) excluding eliminations on D-2.22	360,772	95.5961%		
	\$ 377,392	100.0000%		

b. The LTI amount included for Restricted Stock Units (RSUs) for Duke Energy Kentucky Electric for the forecasted test period is \$0 as noted on workpaper WPD-2.28c.

PERSON RESPONSIBLE: Lisa D. Steinkuhl

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-067

REQUEST:

Refer to Stewart Direct Testimony, page 33. State whether, for those enrolling in the HDHP option, what amounts, if any, are included in the employee's HSA that require no additional contribution, or are automatically included for selecting the HDHP option.

RESPONSE:

Beginning effective January 1, 2020, HSA seed contributions in the amount of \$250 for someone with individual coverage and \$500 for someone covering family members was added to employee HSAs as one-time contributions in January for employees who elected the HSP1 or HSP2 medical options. The seed contribution was to further encourage enrollment in these cost-effective plan options. Beginning effective January 1, 2023, HSA seed and employer matching HSA contributions are combined into a single company contribution. The company contribution is equal to \$850 for someone with individual coverage and \$1,700 for someone covering family members. The company contribution is provided as a single contribution in January to make it easier for employees to build their HSA balances or apply to eligible health care expenses while still encouraging enrollment on the HSP medical options.

PERSON RESPONSIBLE: Jacob J. Stewart

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-068

REQUEST:

Refer to Stewart Direct Testimony, page 35. Of the 28.9 percent of total medical coverage, provide the total amount paid by employees for premiums and the total amount paid for out-of-pocket costs for the forecasted test period.

RESPONSE:

The projected 28.9% of the estimated total medical coverage cost is a split of 11.0% for employee contributions and 17.9% for employee out-of-pocket costs.

PERSON RESPONSIBLE: Jacob J. Stewart

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-069

REQUEST:

Refer to the Direct Testimony of Ron Adams (Adams Direct Testimony), page 8. Explain whether Duke Kentucky has considered or evaluated insourcing its vegetation management program since the time of its last rate case. If not, explain why not. If so, identify and describe any barriers and provide any economic analysis performed.

RESPONSE:

Duke Energy Kentucky has not considered or evaluated insourcing its vegetation management line clearance crews since the last rate case. Based on our industry engagement, this business model would be an exception rather than a norm. Thus, if there was a business case for this model, it would be more prevalent in the industry.

PERSON RESPONSIBLE: Ron A. Adams

REQUEST:

Refer to the Adams Direct Testimony, page 3.

- a. Describe, in detail, how Duke Kentucky contracts its vegetation management services.
- b. Provide copies of its vegetation management contracts from 2019 through 2021.
- c. On what basis does Duke Kentucky award its vegetation management contracts (i.e., per hour, per mile, etc.). Provide any supporting documentation.

RESPONSE:

CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachments only)

- a. Duke Energy Kentucky generally issues requests for proposal (typically aligned with contract expirations) as part of broader, multi-regional sourcing initiatives for defined scopes. This process generally involves development of a Statement of Work, Technical Specifications and pre-defined pricing templates to assure bids are being submitted in a consistent format to support evaluations. Proposals are evaluated based on criteria including health & safety performance, financial risk assessment, technical compliance, commercial offering, and corporate responsibility (which includes supplier diversity and sustainability).
- b. Please see STAFF-DR-02-070(b) Attachments 1 through 97.

c. Duke Energy Kentucky leverages a hybrid blend of hourly time & equipment, unit pricing (fixed cost per unit to perform a task based on agreed to unit of measure) and lump sum compensation methods based on scope of work being performed. Reference Confidential contract information provided per STAFF-DR-02-070(b).

PERSON RESPONSIBLE: Ron A. Adams

**CONFIDENTIAL PROPRIETARY TRADE
SECRET**

**STAFF-DR-02-070 (b)
CONFIDENTIAL ATTACHMENTS
1-97**

FILED UNDER SEAL

REQUEST:

Refer to the Direct Testimony of James E. Ziolkowski (Ziolkowski Direct Testimony), page 29, lines 7–9.

- a. Explain why Duke Kentucky proposed no change to the Water Pumping rate class.
- b. Duke Kentucky states that the proposed rate decrease for the water pumping rate class was added to the proposed revenues for Rate DS. Explain why Duke Kentucky placed this rate decrease on Rate DS.

RESPONSE:

- a. Mr. Ziolkowski’s Testimony on page 29, lines 7-9 is incorrect. In the rate design process, the Company increased the water pumping rates by approximately 17% (as shown on Schedule M if riders are excluded) which is consistent with the contract between the Company and the water pumping customer.
- b. Mr. Ziolkowski’s Testimony on page 29, lines 7-9 is incorrect. In the rate design process, the increase to the Other – Water Pumping class was subtracted from the Rate DT revenue requirement. In the absence of a contract, the water pumping customer would normally be served under Rate DT.

PERSON RESPONSIBLE: James E. Ziolkowski

REQUEST:

Refer to the Direct Testimony of Paul L. Halstead (Halstead Direct Testimony), page 14.

a. Referring to lines 13 through 17, given that the testimony states Duke Kentucky has a need for cost-effective generation that will diversify its fuel mix, why is the company proposing to initiate a program that provides a financial benefit to the subscribers, rather than allowing the generation to be part of Duke Kentucky's traditional energy portfolio.

b. Explain whether subscribers to this tariff will receive an offsetting reduction or exemption in fuel related costs (PPA or FAC) and the justification behind the response.

RESPONSE:

a. Many customers looking to expand or locate their operations continue to note renewable programs must be offered in order for them to consider Duke Energy Kentucky's specific territory. The Company's goal is to balance the needs of customers who desire to directly participate in renewable resources as well as diversify the fleet assets comprising the fuel mix. The CEC program is intended to balance both diversification of fleet assets as well as customer goals by allowing the subscriber's subscription to recover more than 100% of the asset cost thereby lowering the impact on all customers. Additionally, any energy and capacity revenue from the asset generation in excess of the bill credit will also flow back to all customers.

b. A customer's tariff and riders are not impacted or exempted in anyway by participation in the CEC program. The CEC customer will receive their normal applicable bill (no change in demand, energy or rider charges) and in addition to their normal bill there will be two additional line items on the bill. The additional line items will reflect the subscription charge and bill credit related to the customer's participation in the CEC program.

PERSON RESPONSIBLE: Paul L. Halstead

**Duke Energy Kentucky
Case No. 2022-00372
STAFF Second Set Data Requests
Date Received: January 11, 2023**

STAFF-DR-02-073

REQUEST:

Refer to the proposed Emergency Electricity Procedure tariff sheet. Explain why Duke Kentucky's revisions eliminate any mention of the PSC or other state regulatory agencies.

RESPONSE:

The Company is not aware of the elimination of the KyPSC or other state regulatory agencies in Sheet 100, Emergency Electric Procedures.

PERSON RESPONSIBLE: Bruce L. Sailors