STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

VERIFIED PETITION OF SOUTHERN INDIANA GAS AND ELECTRIC COMPANY D/B/A CENTERPOINT ENERGY INDIANA SOUTH FOR: (1) APPROVAL OF AND A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR FEDERALLY MANDATED NATURAL GAS TRANSMISSION, DISTRIBUTION AND STORAGE PROJECTS (THE "COMPLIANCE PROJECTS"), AND THE COSTS THEREOF, RELATED TO PETITIONER'S COMPLIANCE WITH VARIOUS FEDERALLY MANDATED REQUIREMENTS RELATED TO NATURAL GAS PIPELINE SAFETY AND INTEGRITY; (2) APPROVAL OF PETITIONER'S 5-YEAR PLAN FOR TRANSMISSION, DISTRIBUTION AND STORAGE SYSTEM IMPROVEMENTS PURSUANT TO IND. CODE CH. 8-1-39 ("TDSIC PLAN") (AND FOR COMPLIANCE PROJECTS, IN THE EVENT AND TO THE EXTENT THE COMMISSION CONCLUDES THAT SUCH PROJECTS DO NOT MEET THE REQUIREMENTS OF IND. CODE CH. 8-1-8.4); (3) AUTHORIZE TDSIC TREATMENT AS PROVIDED IN IND. CODE CH. 8-1-39 FOR THE NATURAL GAS TRANSMISSION , DISTRIBUTION AND STORAGE SYSTEM IMPROVEMENTS (AND THE COSTS THEREOF) SET FORTH IN PETITIONER'S TDSIC PLAN; (4) APPROVAL OF PETITIONER'S USE OF ITS ADJUSTMENT ("CSIA") MECHANISM AND RELATED ACCOUNTING DEFERRALS, PURSUANT TO IND. CODE CHS. 8-1-8.4 AND 8-1-39, FOR THE TIMELY RECOVERY AND DEFERRAL OF COSTS RELATED TO SUCH COMPLIANCE AND TRANSMISSION, DISTRIBUTION AND STORAGE PROJECTS (INCLUDING FINANCING COSTS INCURRED DURING CONSTRUCTION); AND (5) APPROVAL OF OTHER RELATED RATEMAKING RELIEF AND TARIFF PROPOSALS CONSISTENT WITH IND. CODE CHS. 8-1-8.4 AND 8-1-39	CAUSE NO. 45612

INDIANA OFFICE OF UTILITY CONSUMER COUNSELOR

PUBLIC'S EXHIBIT NO. 2 – PUBLIC READATED TESTIMONY OF OUCC WITNESS BRIEN R. KRIEGER

December 2, 2021

Respectfully submitted,

Jeffrey M. Reed
Attorney No 11651-49
Deputy Consumer Counselor

SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
D/B/A CENTERPOINT ENERGY INDIANA SOUTH
CAUSE NO. 45612
PUBLIC (REDACTED) TESTIMONY OF
OUCC WITNESS BRIEN R. KRIEGER

I. INTRODUCTION

Q: Please state your name and business address.

A: My name is Brien R. Krieger, and my business address is 115 W. Washington Street, Suite 1500 South, Indianapolis, Indiana 46204.

Q: By whom are you employed and in what capacity?

A: I am employed by the Indiana Office of Utility Consumer Counselor ("OUCC") as a utility analyst in the Natural Gas Division. For a summary of my educational and professional experience and general preparation for this case, including review of applicable Indiana Statutes and Federal requirements, please see Appendix BRK-1.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to evaluate Southern Indiana Gas and Electric Company d/b/a CenterPoint Energy Indiana South's ("CEI South" or "Petitioner") Compliance and System Improvement Adjustment Plan ("CSIA Plan") and to provide recommendations to the Indiana Utility Regulatory Commission ('IURC" or "Commission") concerning Petitioner's request for a Certificate of Public Convenience and Necessity ("CPCN") for the federally mandated projects contained within CEI South's Petition. I also provide recommendations concerning Petitioner's request for a 5-year plan for transmission, distribution, and storage system improvement charge ("TDSIC") pursuant to Ind. Code ch. 8-1-39. I analyze

Petitioner's case-in-chief for its federally mandated natural gas transmission, distribution, and storage projects ("Compliance Projects") and its transmission, distribution, and storage improvement projects ("TDSIC Projects"). I determine whether the Compliance Projects satisfy Commission requirements to receive authorization for a CPCN and if the TDSIC Projects satisfy Commission requirements as required by specific State statutes to be approved as a TDSIC Plan.

Q: What are your recommendations for Petitioner's CPCN and TDSIC Plan approval request?

A: I recommend CEI South remove project contingencies contained in Compliance Projects and TDSIC Projects. Alternatively, if the Commission allows some contingency, CEI South should apply its proposed escalation factor to project estimates before contingency is applied. This would prevent estimate escalation on cost unknowns that may not be needed and are difficult to track.

I recommend the Commission approve Petitioner's CSIA Plan and issue a CPCN to CEI South for its federally mandated Compliance Projects and approve the TDSIC Projects within the TDSIC Plan because the project definitions and explanations meet statutory requirements - except contingency should be removed from Compliance and TDSIC Projects. Like escalation on contingency, I recommend the Engineering & Supervisory/Administration & General ("E&S/A&G") overhead cost not be applied to contingency. If the Commission approves some portion of project contingency, the escalation percentage factor and the overhead percentage factor should not be applied to allowed contingency.

II. OVERVIEW OF CEI SOUTH PETITION AND CSIA PLAN

Q: Please provide an overview of Petitioner's Plan.

A: Petitioner's CSIA Plan proposes Compliance Projects to comply directly or indirectly with Pipeline and Hazardous Materials Safety Administration standards ("PHMSA Rules") and system improvement TDSIC projects. Petitioner's five-year Plan is scheduled for January 1, 2022 – December 31, 2026. The proposed capital budget estimate for the Compliance Projects is approximately $230.4 million and the proposed capital budget estimate for the TDSIC Projects is $49.5 million. (Petitioner's Exhibit No. 2, page 13, line 19 and page 22, line 19.) There are no operations and maintenance expense projects contained in the Compliance Plan or TDSIC Plan.

The project categories of the Compliance Projects and the TDSIC Projects are the same as Petitioner's prior CSIA Plan collected through its CSIA mechanism – Cause No. 44429. The Compliance Project categories are Transmission Modernization ("TMOD"), Distribution Modernization ("DMOD"), Bare Steel and Cast Iron ("BSCI"), and Storage Modernization ("SMOD"). The TDSIC Project categories are System Improvement-Safety and Reliability, Public Improvement, Rural Extension, and Targeted Economic Development ("TED").

The Direct Testimony, Exhibits, and work papers of Steven A. Hoover (Petitioner's Exhibit No. 2.) provides Petitioner's project benefit justification, the capital planning process, and the detailed work orders ("best estimates"). The Direct Testimony of Adam M. Gilles (Petitioner's Exhibit No. 3.) provides Petitioner's analysis of why the Compliance Projects meet PHMSA requirements.

I reviewed these documents to determine if Petitioner provided evidence that the projects meet statutory requirements and are presented accurately as either a Compliance project or TDSIC project with a best estimate.

Q: What Statutes define requirements for Commission approval of the Compliance projects?

Petitioner submits the Compliance portion of the CSIA Plan as Compliance projects under Ind. Code § 8-1-8.4-2 and provides testimony that the Compliance Projects will allow Petitioner to comply with PHMSA Rules. Petitioner requests a CPCN to implement Compliance Projects, recovery through a CSIA adjustment mechanism, and deferral of unrecovered costs all pursuant to Indiana Code § 8-1-8.4 and §§ 8-1-2-19, -2-23 and -2-42.

The Compliance portion of the Plan must contain federally mandated compliance projects as defined under Ind. Code § 8-1-8.4-2 and specifically, the Compliance Projects need to comply directly or indirectly with PHMSA Rules. For my analysis I determined if the costs are federally mandated costs defined under Ind. Code § 8-1-8.4-2. My analysis of Petitioner's projects consists of detailed review of Petitioner's evidence compared to the statutes and PHMSA rules which are included in Appendix BRK-1.

After I determine if Compliance Projects meet the PHMSA Rule requirements and allow Petitioner to comply directly or indirectly with the PHMSA Rules, I can then make my recommendation to the Commission for its determination whether to authorize a CPCN for a federally mandated compliance project.

Q: What Statutes define requirements for Commission approval of the TDSIC projects?

All TDSIC Projects, including rural extensions within the Plan, must meet the requirements of Ind. Code § 8-1-39-2 to be eligible transmission, distribution, and storage system improvements. The Commission must determine if the Plan is reasonable in accordance with Ind. Code § 8-1-39-10.

Petitioner's proposed TDSIC Plan includes rural extension projects governed by Ind. Code § 8-1-39-11. If the TDSIC Plan is approved, the Commission shall issue an order as described in Ind. Code § 8-1-39-10(b).

Q: Please describe the main difference between Compliance Projects and TDSIC Projects.

A: A TDSIC Project differs from a Compliance Project because the utility chooses to improve its system without prescriptive direction from a regulating body. The TDSIC projects are not mandated like a PHMSA project, but the TDSIC project may operationally improve the utility system or provide service to new customers in a rural extension or an economic development project.

Q: Is CEI South' Plan a continuation of Cause No. 44429?

A: No. My analysis indicates Petitioner's projects are stand-alone projects with specific best estimates not connected to prior projects. Petitioner does not request any costs recovery from Cause No. 44429 in this petition.

III. ANALYSIS OF PETITIONER'S PLAN AND PROJECTS

Q: What support did Petitioner provide to demonstrate the Compliance projects are consistent with the PHMSA Rule requirements?

A: In Mr. Gilles' Direct Testimony (Petitioner's Exhibit No. 3), Petitioner cites specific parts of the Code of Federal Regulations – Title 49 Part 192 (the "Code") as reasons for the Compliance Projects. The Code involves both prescriptive and non-prescriptive projects. The non-prescriptive projects provide the structure of on-going risk assessments, continuous improvement, and planning. PHMSA, 49 CFR Part 192, Subpart O, mandated creation of a Transmission Integrity Management Program ("TIMP") and 49 CFR Part 192 Subpart P mandated creation of a Distribution Integrity Management Program ("DIMP").

Mr. Gilles addresses underground storage well logging assessments and remediation of storage issues. He indicates these projects are addressed by the Storage Rule which is in response to Protecting Our Infrastructure of Pipelines Enhancing Safety Act of 2016. (Petitioner's Exhibit No. 3, page 9 lines 3-17 and page 22, lines 6-19.) My review and analysis of Petitioner's support of Compliance Projects with respect to PHMSA requirements is in my testimonial Appendix 1. I found the proposed Compliance Projects to be compliant with PHMSA requirements.

Q: Please describe the process Petitioner performed for prioritizing projects.

A: Petitioner explained its internal process for project prioritization is a result of its asset risk assessment. (Petitioner's Exhibit No. 3, page 10, lines 16-24.) Mr. Gilles provides additional discussion of risk assessment methods on page 13, line 7 to page 14, line 9. He listed methods for selecting and prioritizing projects and

includes such items as: integrity assessment findings, abnormal operating conditions, Safety Management System ("SMS") reports, and field investigations. The over-arching plans, processes and models are contained in Petitioner's Exhibit No. 3, Attachments AMG-1 through AMG-5.

Q: What support did CEI South provide for its Compliance and TDSIC project best estimates?

A: Mr. Steven A. Hoover describes the process for developing the individual best estimates in his testimony. (Petitioner's Exhibit No. 2.) His testimony provided project descriptions and total project cost estimates. Each individual Compliance Project (Confidential Attachments SAH-4 through SAH-7) and each individual TDSIC Project (Confidential Attachment SAH-9) has project designation tracking numbers, location, simplified project description, estimated cost, and plan year in the Attachments to Petitioner Exhibit No. 2. Each of these projects has a separate detailed work order which Petitioner provided in work papers. For example, the following four individual work order items had summarized estimated costs with a breakdown of specific costs and units contained within each item. (Confidential Attachment BRK-1, Confidential CEI South Example Work Order.)

1. Installation
   - HDD Installation – per foot
   - Traffic control – lump
   - Stations tie-ins – per day
2. Engineering Services
   - Pipeline Engineering – percentage of unit price
   - Soil Borings – lump
3. Materials
   - Pipe type – per foot
   - Bends – each
   - Miscellaneous Material – lump
   - Steel Tariff Cost Escalation Factor (pipe)- % of pipe material

Many of the projects contained an additional project cost under the work order items in the work order – contingency. An escalation factor of 2.4% per year was applied to the total of all projects starting in 2023 which escalated the embedded project contingency. See Petitioner's Exhibit No. 2, page 52, lines 4-16 for Petitioner's explanation of the applied escalation factor.

For my testimony, I define "base cost" as Petitioner's project cost estimate, excluding all contingency. Petitioner's "base cost" estimates were defined prescriptive, and detailed. I found the prescribed detailed base cost estimates reasonable except for the contingency which added an unknown estimate, and sometimes without units, to the detailed work order level estimate.

I also have concerns about layering of 18% for Engineering & Supervision (13%), plus Administrative & General (5%), on a cost estimate that contains contingency and 2.4% escalation per year. I review later in my testimony.

Q: Please provide your review of Petitioner's TDSIC Projects.

A: CEI South is requesting approximately $49.5 million of TDSIC Projects to improve safety and reliability. The majority of costs are for System Improvement – Safety & Reliability projects. Petitioner states the majority of the projects are for incremental growth. (Petitioner's Exhibit No. 2, page 24, lines 12 – 14.) Furthermore, CEI South indicates it is using a 3% growth rate to the existing loads. (Petitioner's Exhibit No. 2, page 31, lines 11 – 13.) I have no issue with Petitioner using this growth rate in its system modeling. My analysis indicates Petitioner has provided justification for TDSIC Projects including those specifically designed for the capacity addition. Petitioner has provided a detailed work order level estimate,

but the contingency, escalation, and overhead issues reside in the majority of projects.

Q: What issues did you find in your evaluation of project work orders?

A: I reviewed the detailed work orders associated with each project. The work orders provide costs and units for the costs; however, Petitioner included contingency dollars in the projects for various items which increases the cost for *potential* unknown costs. The contingency reduces the confidence in the proposed project estimate considering Petitioner's experience of completed TDSIC and Compliance projects over the last seven years.

IV. ANALYSIS OF CONTINGENCY IN PETITIONER'S DETAILED ESTIMATE

Q: Do you agree with applying contingency to the detailed work order estimates?

A: No. I have three specific reasons contingency should not be used in Petitioner's estimates; 1) ACEE methods do not apply to estimating in the natural gas industry, 2) Petitioner has vast knowledge and historical documentation of completed Compliance and TDSIC projects, and 3) Petitioner is allowed a 25% increase to FMCA project estimates without justification being provided to the Commission. Petitioner is allowed increases on the TDSIC projects with proper justification being provided to the Commission.

Q: Please explain why the ACEE methods do not apply to the natural gas industry.

A: I have attached ACEE International Recommended Practice No. 18R-97. (Attachment BRK-2.) ACEE recognizes its estimating methodology is a guideline but not a standard (Attachment BRK-2, page 2, last paragraph under Purpose.)

Also, ACEE points out No. 18R-97 does not address non-process industries transportation of hydrocarbon materials. (Attachment BRK-2, page 3, first paragraph.) My analysis of ACEE International Recommended Practice No. 18R-97 indicates it is guideline. But accurate records and experience working with material vendors, contractors, and internal capabilities are the primary drivers in the estimating process.

Q: Please explain your opinion on Petitioner's potential use of experience and historical information.

Petitioner has extensive research of historical work order information including land acquisition, soil analysis, design locating, material, and labor bids. Petitioner uses its experience and information for detailed engineering performed six to eighteen months before planned construction. (Petitioner's Exhibit No. 2, page 47, lines 6 – 9.) This same historical information and Petitioner's experience applies to projects estimated for years beyond the first two years, presuming Petitioner has performed preliminary engineering to arrive at a proposed best estimate.

Petitioner's estimates should be more accurate because of Petitioner's vast estimating experience gained in Cause No. 44429. Petitioner's near-term estimates, less than two years, or at least within eighteen months of construction, should have engineering estimates based upon detailed site visits to arrive at a best estimate. This means zero or minimal contingency especially on materials, internal labor, and outside bids.

Q: Please explain the Statutes that allow costs to be recovered greater than the best estimate.

A: Both Indiana Code sections discuss cost recovery and allow Petitioner to justify costs greater than previously approved best estimates for recovery through rates. The Compliance statute regarding recovery greater than approved estimate, Indiana Code §8-1-8.4-7(c)(3) states:

> Actual costs that exceed the projected federally mandated costs of the approved compliance project by more than twenty-five percent (25%) shall require specific justification by the energy utility and specific approval by the commission before being authorized in the next general rate case filed by the energy utility with the commission.

The TDSIC statute regarding recovery greater than the approved estimate, Indiana Code § 8-1-39-9(g)) states:

> Actual capital expenditures and TDSIC costs that exceed the approved capital expenditures and TDSIC costs require specific justification by the public utility and specific approval by the commission before being authorized for recovery in customer rates.

The statute precludes allowing contingencies in estimates because the unknown contingency will not be able to be justified or separated from other actual costs that may be greater than the project approved estimate.

Q: Please further explain Petitioner's use of contingency with an actual project.

A: I will use Confidential Attachment BRK-1 for this example. This 2022 project contains four separate contingencies: Construction Labor Contingency, Material Contingency, Labor Contingency, and Land Acquisition Contingency. There are two issues with contingency in this project. The first issue is contingency is just labelled contingency and is not described by a particular difficult project attribute that may be encountered. For example, the estimate could point out the probability

of a confluence of underground utilities in a congested area that may cause additional labor for precise excavation through different layers of utilities. This contingency label and the associated percentage are in addition to other detailed estimates in the same project category as found in Confidential Attachment BRK-1. The second issue is that these contingencies were added to a project that is to begin construction during 2022, which is within 1.5 years from the best estimate development. As discussed below, Petitioner designed first year projects as Class 2 estimates. The Class 2 and the Class 1 estimating process is set to ACEE accuracy ranges of -15% to +20% and -10% to +15%, respectively, with both ranges below the OUCC threshold for further investigation.

For the first issue – project detail, on page 3 of the workpaper, Material and Freight costs are detailed even including escalation for any material Tariff adders. The Material and Freight Contingency is <Confidential [redacted] Confidential>. Materials are broken down into 12 different items showing good explanation and detail. On page 4, the installation types are estimated which includes labor. Petitioner adds an additional <Confidential [redacted] Confidential> on estimates that are reasonable. On page 5 there are five contingencies and range from <Confidential [redacted] Confidential> on well described items. On page 6 there is contingency on Design Survey that has an estimate based upon percentage of some "lump" unit of measure.

The second issue is construction schedule timing versus when the estimate was performed. Petitioner explains the estimating process for detailed engineering estimates or ACEE Class 2 estimates are for projects planned for the first year of

the Plan, 2022 Plan Projects. Mr. Hoover states detailed engineering is performed six to eighteen months before planned construction and is intended to eliminate most assumptions. (Petitioner's Exhibit No. 2, page 47, lines 6-9.) Mr. Hoover continues on page 48, lines 19-20 that the first-year projects were designed to an ACEE Class 2 estimate. The use of contingency seems contradictory to the described preciseness of estimates Petitioner carries out for the 2022 projects.

Q: Please summarize your analysis of Petitioner's use of contingency.

A: Contingency is not necessary for providing best estimates for Compliance Projects or TDSIC Projects because the statutes allow for *actual costs* greater than a best estimate. I have concerns because the contingency dollars make actual costs non-transparent since Petitioner is not required to itemize costs when actual costs are below estimates, or if actual costs are greater than the estimate for a TDSIC project or by more than 25% for a FMCA project, Petitioner needs to justify actual costs to the Commission. My review of the applicable Indiana Code sections is contained in Appendix BRK-1.

Q: Are additional reasons Petitioner's work orders should not include contingency?

A: Yes. Petitioner should have good recent historical data for the detailed estimate categories. Inflationary costs are captured by the escalation factor. Contingencies should not be a placeholder for *potential* unknowns. My experience from prior engineering work and TDSIC/FMCA contract reviews, has been if a portion of the installation requires a significant contingency adder and this installation will be performed by subcontractors, the subcontractors will include contingency in some

form of their own bid. Much of the TDSIC/FMCA project work is estimated with contractor labor.

This would be another layer of contingencies. There is no guarantee Petitioner will find or remove contingencies from any bid, and this would be a duplication of contingencies in the estimate. With Petitioner's experience, I do not expect contingencies and escalation of cost are both needed and especially are not needed in the near-term projects.

V. OUCC'S SPECIFIC ANALYSIS OF OVERHEAD COSTS AND ESCALATION OF PROJECT COSTS TO ARRIVE AT A FINAL BEST ESTIMATE

Q: Do you have concerns about any of the described costs in Petitioner's best estimate other than the contingency cost?

A: Yes. I have concerns about adding 18% for E&S/A&G on the cost estimate that contains the unknown cost - contingency. Separately, the 2.4% per year escalation multiplier is on a cost estimate that is already inflated with both contingency and E&S/A&G loadings on top of contingency. My analysis is the E&S loading does not apply to all contingency such as material cost within a project especially when there is already a detailed material list with E&S applied to an actual estimate.

For example, assume a project cost $10 and $1 for contingency. The $1 contingency becomes $1.18 with the E&S/A&G and then the final cost for the $1 contingency after 3 years of escalation is $1.27 ($1.18 x 1.024^3) or a 27% increase on a *potential* cost that may not be able to be clearly justified if cost overruns occur. There should be no E&S/A&G or Escalation on an unknown cost – contingency. Mathematically, with these two multipliers, the unknown costs are compounding. I

do not object to the E&S/A&G percentages Petitioner used. I do object to the layering of these loadings on top of contingency.

Q: Has the Commission provided a ruling on applying E&S/A&G or escalation on contingency?

A: Yes. In Cause No. 45183, the Commission disallowed Petitioner's escalation factor applied to contingency. The Commission indicated for FMCA project costs greater than the best estimate there is a 25% allowance built into the Statute. The Commission specifically discusses Contingency Amounts and Escalation Factors starting on page 18, Item (a) of the Final Order with its disallowance discussed on the following page. (Order, September 4, 2019, page 20, Item (b) Conclusion.)

VI. SUMMARY OF OUCC'S ANALYSIS OF PLAN

Q: Does Petitioner's associated PHMSA designation justify each individual Compliance Project within its CSIA Plan.

A: Yes. I reviewed the CFRs and PHMSA Rules and conclude Petitioner's Compliance Projects meet the TIMP Requirement – 49 CFR 192 Subpart O – Gas Transmission Pipeline Integrity Management, DIMP Requirement – 49 CFR 192 Subpart P – Gas Distribution Pipeline Integrity Management, and the final Underground Storage Rule. I found no duplication of costs from Petitioner's prior CSIA recovery mechanism approved in Cause No. 44429.

Q: Did Petitioner justify the projects as TDSIC Projects within its CSIA Plan.

A: Yes. I reviewed Petitioner's testimony and detailed work orders. My analysis has determined Petitioner's TDSIC Projects meet Ind. Code § 8-1-39 requirements as eligible Transmission, Distribution, and Storage System Improvement projects as contained in Petitioner's TDSIC Plan. I considered if Petitioner's proposed

improvement projects are for purposes of safety, reliability, or system modernization with established incremental benefits. I found no duplication of TDSIC Project costs from Petitioner's prior CSIA recovery mechanism approved in Cause No. 44429.

Q: Did Petitioner provide margin tests for rural extensions or Targeted Economic Development Cost ("TED")?

A: No. Petitioner will need to provide the OUCC with 20-year margin tests for rural extension projects or TED projects if these project types come to fruition.

Q: Please summarize the reasons for removing the contingency, the layering of E&S/A&G, and escalation on contingency in Petitioner's Plan.

A: The addition of contingency dollars reduces transparency when reviewing the project costs for justified cost overruns. The best estimates should have explicit cost types and be as accurate as possible so the Commission and the OUCC are able to compare the estimate to the actual costs proposed for recovery. As a near term project approaches, the bid contingencies and material contingencies should be zero based upon actual bids and ordered material. Additionally, E&S/A&G and escalation on contingency further distorts and increases the estimated total cost which is designed to cover actual costs. This leaves the potential for less Petitioner monitoring of project costs and potentially leading to higher than required costs.

Q: What Commission approvals did Petitioner request for the Compliance Projects and TDSIC Projects in this proceeding?

A: In the petition, Petitioner requested the following items:

- Determining the PHMSA rules are federally mandated requirements as defined by Ind. Code § 8-1-8.4-5;
- Finding that CEI South is an energy utility as defined by Ind. Code § 8-1-8.4-3;

- Finding that the Compliance Projects of the CSIA Plan is a compliance project under Ind. Code § 8-1-8.4-2;
- Finding that the Compliance Projects of Petitioner's CSIA Plan will allow it to comply directly or indirectly with the PHMSA Rules;
- Finding that costs incurred with Compliance Projects of the CSIA Plan are federally mandated costs under Ind. Code § 8-1-8.4-4;
- Petitioner's TDSIC Plan meets Ind. Code § 8-1-39 requirements; and
- Approval of ongoing review of Compliance Projects of the TDSIC Plan as part of Petitioner's semi-annual CSIA Mechanism filings.

Q: Did Petitioner meet the Statute requirements for the Compliance Projects and TDSIC Projects in this proceeding?

A: Yes. Petitioner is an Indiana utility and has requested approval for projects that meet PHMSA requirements as Compliance projects and the Indiana statutes for either Compliance projects or TDSIC projects within a TDSIC Plan. Inclusion of contingency does not affect the type of project to be approved, but contingency should be removed because it is not necessary for a best estimate.

VII. RECOMMENDATIONS

Q: What do you recommend regarding contingencies and adding E&S/A&G, and escalation on contingency?

A: I recommend all contingency dollars be removed from the project estimates. If the Commission allows some contingency, I recommend Petitioner's proposed E&S/A&G and escalation percentages be applied to Petitioner's project estimate after removing any contingency dollars allowed.

Q: What steps do you recommend if new projects are requested as part of the CSIA Plan updates?

A: New projects should be specifically identified through name and location along with workorder level detail of estimated costs. Petitioner should provide similar workorder detail in its updates as it provided the OUCC for the CSIA Plan projects. In addition, Petitioner should provide reasons the proposed project either meets PHMSA requirements or improves safety, reliability, or modernization of the transmission, distribution or storage systems, thus meeting TDSIC statute requirements. Where appropriate, Petitioner should cite PHMSA requirements or recommendations or relevant TDSIC statue citations as appropriate.

Q: Do you have any recommendation for Petitioner's Update process if the Commission approves the Compliance Projects and the TDSIC Projects of the CSIA Plan?

A: Yes, the following are my recommendations for the Update process:

1. Petitioner should supply reasons substantiating new estimates if a project's new estimate exceeds an approved best estimate by greater than 20% or $100,000.

2. Petitioner should supply reasons substantiating actual costs incurred if a project's actual cost exceeds the approved best estimate by greater than 20% or $100,000.

3. Petitioner should supply a margin test for each individual rural extension project and Targeted Economic Development project.

Q: Please summarize your best estimate recommendations.

A: After analyzing Petitioner's CSIA Plan, I recommend the Commission issue a CPCN for the federally mandated Compliance Projects and approve the TDSIC Plan and Projects without contingency. If some contingency is approved, I recommend the applied E&S/A&G and the escalation factor be applied to project

estimates before any approved contingency. Approved contingencies should be added *after* the two multipliers to arrive at the final approved project cost.

Q: Please summarize if the Projects meet PHMSA or TDSIC requirements.

A: Per Ind. Code, the PHMSA rules are federally mandated requirements and Petitioner's proposed Compliance Projects meet the PHMSA rules. My analysis indicates the projects comply with PHMSA rules. The associated costs are federally mandated costs.

The TDSIC Projects are well defined and meet TDSIC project statutes as system improvements. Petitioner is an energy utility and Petitioner's CSIA Plan meets Ind. Code requirements for Compliance Projects and TDSIC Projects. If the CSIA Plan is approved, my understanding is that Petitioner intends to file a semi-annual update with the CSIA adjustment for ongoing review and potential Commission approval.

Q: Does this conclude your testimony?

A: Yes.

APPENDIX BRK-1 TO THE TESTIMONY OF OUCC WITNESS BRIEN R. KRIEGER

I. PROFESSIONAL EXPERIENCE

Q: Please describe your educational background and experience.

A: I graduated from Purdue University in West Lafayette, Indiana with a Bachelor of Science Degree in Mechanical Engineering in May 1986, and a Master of Science Degree in Mechanical Engineering in August 2001 from Purdue University at the IUPUI campus.

From 1986 through mid-1997, I worked for PSI Energy and Cinergy progressing to a Senior Engineer. After the initial four years as a field engineer and industrial representative in Terre Haute, Indiana, I accepted a transfer to corporate offices in Plainfield, Indiana where my focus changed to industrial energy efficiency implementation and power quality. Early Demand Side Management ("DSM") projects included ice storage for Indiana State University, Time of Use rates for industrials, and DSM Verification and Validation reporting to the IURC. I was an Electric Power Research Institute committee member on forums concerning electric vehicle batteries/charging, municipal water/wastewater, and adjustable speed drives. I left Cinergy and worked approximately two years for the energy consultant, ESG, and then worked for the OUCC from mid-1999 to mid-2001.

I completed my Masters in Engineering in 2001, with a focus on power generation, including aerospace turbines, and left the OUCC to gain experience and practice in turbines. I was employed by Rolls-Royce (2001-2008) in Indianapolis working in an engineering capacity for military engines. This work included: fuel-flight regime

performance, component failure mode analysis, and military program control account management.

From 2008 to 2016 my employment included substitute teaching in the Plainfield, Indiana school district, grades 3 through 12. I passed the math Praxis exam requirement for teaching secondary school. During this period, I also performed contract engineering work for Duke Energy and Air Analysis. I started working again with the OUCC in 2016.

Over my career I have attended various continuing education workshops at the University of Wisconsin and written technical papers. While previously employed at the OUCC, I completed Week 1 of NARUC's Utility Rate School hosted by the Institute of Public Utilities at Michigan State University. In 2016, I attended two cost of service/rate-making courses: Ratemaking Workshop (ISBA Utility Law Section) and Financial Management: Cost of Service Ratemaking (AWWA). In 2017, I attended the AGA Rate School sponsored by the Center for Business and Regulation in the College of Business & Management at the University of Illinois Springfield and attended Camp NARUC Week 2, Intermediate Course held at Michigan State University. I completed the Fundamentals of Gas Distribution on-line course developed and administered by Gas Technology Institute in 2018. In October 2019, I attended Camp NARUC Week 3, Advanced Regulatory Studies Program held at Michigan State University by the Institute of Public Utilities.

My current responsibilities include reviewing and analyzing Cost of Service Studies ("COSS") relating to cases filed with the Commission by natural gas, electric and water utilities. Additionally, I have taken on engineering responsibilities within the

OUCC's Natural Gas Division, including participation in "Call Before You Dig-811" incident review and natural gas emergency response training.

Q: Have you previously filed testimony with the Commission?

A: Yes. I have provided written testimony concerning COSS in Cause Nos. 44731, 44768, 44880, 44988, 45027, 45072, 45116, 45117, 45214, 45215, 45447, and 45468. Additionally, I have provided written testimony for Targeted Economic Development ("TED") projects in 2017/2018/2020 and various Federal Mandate Cost Adjustment ("FMCA") and Transmission, Distribution, and Storage System Improvement Charges ("TDSIC") petitions. I filed testimony or provided analysis in the following FMCA or TDSIC 7-Year Plan or Tracker petitions: Cause Nos. 44003, 44429, 44430, 44942, 45131, 45007, 45264, 45330, 45400 and 45560.

While previously employed by the OUCC, I wrote testimony concerning the Commission's investigation into merchant power plants, power quality, Midwest Independent System Operator and other procedures. Additionally, I prepared testimony and position papers supporting the OUCC's position on various electric and water rate cases during those same years.

II. BACKGROUND OF TESTIMONY ANALYSIS

Statutory Requirements and Best Estimates

Q: What are the main conditions of Indiana's TDSIC statute, Ind. Code § 8-1-39, under which CEI South is requesting approval of its TDSIC Plan?

A: CEI South requests approval of its TDSIC Plan and estimated costs ("best estimate") to implement its TDSIC Plan including 80% cost recovery through a semi-annual cost adjustment mechanism ("CSIA tracker") and deferral of 20% unrecovered costs until its

next base rate case. Petitioner requests capital investments contained in its proposed five-year TDSIC Plan to be eligible transmission, distribution, and storage system improvements within the meaning of Ind. Code § 8-1-39-2, which includes:

- Improvements for purposes of safety, reliability, system modernization, or economic development.

- New or replacement projects not included in the public utility's rate base in its most recent general rate case.

Petitioner's proposed TDSIC Plan includes rural extension projects with each project having an explicit main extension with new natural gas services. The rural extension must be in rural areas pursuant to Ind. Code § 8-1-39-11. If the Plan is approved, the Commission should include findings as described as in Ind. Code § 8-1-39-10(b), including:

- A finding of the best estimate of the cost of the eligible improvements.
- A determination the plan projects meet public convenience and necessity.
- A determination the estimated costs of the eligible improvements are justified by incremental benefits attributable to the plan.

Q: What are the Indiana Code estimate requirements for the Compliance Plan projects?

A: For the Compliance Plan, Indiana Code § 8-1-8.4-6(b) provides:

> In determining whether to grant a certificate under this section, the commission shall examine:
>
> (1) The following, which must be set forth in the energy utility's application for the certificate sought, in accordance with section 7(a) of this chapter…
>
> (B) A description of the projected federally mandated costs associated with the proposed compliance project, including costs that are allocated to the energy utility: (i) in connection with regional transmission expansion planning and construction; or (ii) under a Federal Energy Regulatory Commission approved tariff, rate schedule, or agreement.

Q: Please describe your understanding of the differences between Compliance Projects and TDSIC Projects.

A: CEI South's 5-Year Plan contains two parts: 1) the Compliance Plan is established to comply with the PHMSA requirements established according to Indiana Code § 8-1-8.4, and 2) the TDSIC Plan is established according to Indiana Code § 8-1-39-9. All projects are subject to increased OUCC scrutiny when estimates or actual spent dollars increase 20% or $100,000 from previously approved estimates.

PHMSA establishes standards and policies to improve the safety and integrity of the natural gas system to prevent incidents and the corresponding Compliance projects follow PHMSA regulations for proactively improving safety and reducing risk. Natural gas utilities are required by PHMSA to improve the integrity of natural gas systems in part as prescribed in 49 CFR 192 Subparts O and P: transmission integrity management and distribution integrity management plans. Underground storage integrity is covered under the rule Safety of Underground Natural Gas Storage Facilities – the Storage Rule. The following are a few examples of integrity management practices:

1. Retrofit the pipeline mains for in-line-inspection ("ILI") causing the utility to replace service stubs, fittings, elbows, and other components to make ready for continuous passage of the un-manned ILI inspection device.

2. Bare steel and cast iron ("BSCI") pipeline replacement necessary for corrosion control of pipes.

3. Improvement/Replacement of inadequate odorization stations.

4. PHMSA Underground Storage Rule of 2017 with PHMSA Final Underground Storage Rule published February 12, 2020.

5. PHMSA Plastic Pipe Rule.

6. CEI South's Priority Pipe recognition to implement pipe replacement of higher risk situations.

A TDSIC Project differs from a Compliance Project because the utility choses to improve its system. The TDSIC projects are not mandated by PHMSA, but the TDSIC project may operationally improve the utility system or provide service to new customers as in a rural extension or a targeted economic development project.

ANALYSIS PREPARATION AND PETITIONER'S SUPPORT

Q: Please describe the review you conducted to prepare this testimony.

A: I reviewed CEI South's Petition, Testimony, Attachments, and work papers for this Cause. I also reviewed Petitioner's prior TDSIC filings and Commission Orders. I participated in the OUCC case team meetings concerning Petitioner's case. I reviewed Petitioner's direct testimony and attachments of Adam M. Gilles which focused on Petitioner's Compliance Projects and PHMSA requirements. I reviewed Petitioner's Plan Governance documents and the risk analysis in Petitioner's Exhibit No. 3 Attachments AMG-1, AMG-2, AMG-3, and AMG-4, and AMG-5. I reviewed and analyzed the Confidential Testimony, Attachments, and work papers of Petitioner's Witness Mr. Steven A. Hoover to determine if Petitioner has provided best estimates and the OUCC's similar evaluation on best estimates for Compliance projects.

Q: Have you reviewed CEI South's Compliance Plan and TDSIC Plan on a project basis?

A: Yes, I reviewed CEI South's entire Petition, testimony, workpapers, and the confidential portions of the filing, including Petitioner's Exhibit No. 2 and the associated project costs in Confidential Attachments SAH-4 through SAH-9 that include all project numbers,

project categories, and the planning year. I reviewed the workorder level detail Petitioner provided for the proposed individual Compliance and TDSIC Projects.

Compliance Projects

Q: Please describe the categories of Petitioner's Compliance Plan.

A: The Compliance Plan has four project groupings: Transmission Modernization ("Transmission Projects" or "TMOD"), Distribution Modernization ("Distribution Projects" or "DMOD"), Bare Steel and Cast Iron ("BSCI Projects"), and Storage Modernization ("Storage Projects" or "SMOD"). Distribution Projects and BSCI Projects make up the majority of the projects. The Compliance Project groupings are further characterized with the following major categories:

- In-Line-Inspection ("ILI") retrofits
- Gas Quality
- Exposures
- Regulator Stations
- Priority Pipe
- Pressure Tests
- Casings
- Bridge Crossings
- Legacy Steel
- Inside Meters
- Obsolete Equipment
- Well Construction / Remediation
- Pressure Monitoring
- Emergency Response

TDSIC Projects

Q: Please describe Petitioner's TDSIC Project types in its Plan.

A: Petitioner's TDSIC Plan has four major categories: Public Improvement, System Improvement, Rural Extensions, and Targeted Economic Development ("TED"). The TED projects and the rural extensions are designed for the addition of customers for economic

development purposes and serving previously unserved rural areas. Combined, TED and Rural Extension Projects account for approximately $2,500,000, or 5% of the TDSIC Project estimated costs. The rural extensions and TED projects, if anticipated for construction, will need 20-year margin tests. The Public System Improvement Projects is the largest cost category of the TDSIC Projects.

III. IMPROVEMENTS OF APPROVED BEST ESTIMATES AND ACTUAL COSTS GREATER THAN APPROVED BEST ESTIMATE

Q: Please describe the estimating process Petitioner performed for calculating costs of project work orders.

A: Petitioner uses the Association for the Advancement of Cost Engineering ("ACEE") methodology for estimating the costs of projects and is described in Section V: Capital Investment Planning and Estimating Processes (Petitioner's Exhibit No. 2, starting on page 39, line 1.) Petitioner explains the use of ACEE methodology establishes "a well-known and trusted framework to accomplish this objective." (Petitioner's Exhibit No. 2, page 48, lines 10-12.) The object is to standardize and produce acceptable ranges for project estimates based upon the nearness of construction. Petitioner summarizes its estimating method is a "detailed engineering" estimate consistent with ACEE practices. (Petitioner's Exhibit No. 2, page 47, line 23 to page 48, line 2.)

Q: How accurate should a best estimate be in its advanced stages of development?

A: The project estimator needs to improve estimates and be more accurate as the project develops from initial scope to project scheduling, material ordering and contractor selection. The IURC recognizes an approved "best estimate" can change but the best estimate for a project in advanced stages of construction should be accurate and needs

refinement with the estimate maturing as the project is scheduled for construction. AACE final cost accuracy standards for Class 1 project cost estimates are between 10% to +15% and for Class 2 the range is -15% to +20% of project cost estimates. These levels have historically been accepted by the IURC in previous TDSIC proceedings as reasonable cost variances for "best estimates" for projects to be constructed in the current year.

Q: What is your understanding of Petitioner's process for developing a best estimate?

A: For the latter years of the TDSIC Plan, the original approved best estimates are not typically derived from an engineering estimate, which includes a detailed site visit, but are based on costs of similar projects, review of existing maps and service records, and other prior project experiences.

Petitioner does not perform the refined engineering estimate on most projects until 6 months to 1½ years before the construction phase. For CEI South, the engineering cost estimate is carried out when projects are engineered with detailed site visits and subsequently placed in the work order queue. This allows Petitioner to have a detailed work order of materials, labor and equipment, including a schedule for the complete work order packet, used for its internal crews and material acquisition or to be bid by outside contractors. CEI South's refined estimates or engineering estimates are a typical process within the construction industry in order to finalize the work order/bid package.

Q: How will the OUCC review actual costs or a "best estimate" that exceeds a prior approved "best estimate"?

A: All new TDSIC Plan project estimates, all updated estimates, and actual costs exceeding the approved best estimate will be reviewed. The analysis will focus on whether Petitioner should have reasonably foreseen increases to actual costs or new estimates as compared to

the estimates last approved. The OUCC will closely scrutinize any projects with a variance increase of 20% or $100,000. The OUCC refers to this magnitude of variance as the "OUCC Threshold."

Q: What are some of the parameters you will review in your future best estimate analysis?

A: Petitioner provided a "best estimate" for TDSIC Projects and Compliance Projects in the TDSC Plan. These project costs are estimated for projects to be completed in a 5-Year Plan cycle; some to be constructed the first year, others a few years out, and some projects scheduled for the fifth year.

Petitioner may find it necessary to update the original "best estimate" on an ongoing basis as the individual project approaches the construction phase. Changes to the "best estimates" and actual costs incurred should be within Petitioner's control. My analysis may consider some of the following situations.

- New, pending, and changing PHMSA requirements.
- Underground pipe corrosion conditions extending beyond the original estimated pipe segment.
- Pressure tests discovering inadequate services.
- Undocumented pipe materials.
- Incorrect drawings not capturing "as-built" construction.
- Poor locates of all underground utilities: utility and private.
- Changed municipality requirements for drainage, easements, accessibility, and restoration.
- Historical records of service and main material types.

Petitioner's experience in its prior CSIA 7-Year Plan, Cause No. 44429, should improve its estimating and contractor procurement. Petitioner has better working knowledge with municipalities and railroads. Over the recent time frame, Petitioner has continued to

develop its asset records as part of PHMSA requirements. In this Cause, I expect less variances for cost or estimating variables within Petitioner's control.

Q: What requirements for Compliance Projects and TDSIC Plan Projects has the Indiana Code or Commission imposed on actual costs greater than the approved best estimate?

A: Petitioner is required to provide a "best estimate" per Ind. Code § 8-1-39-10(b)(1) for each TDSIC Plan project and receive Commission approval of the original or updated Plan. Indiana Code § 8-1-39-9(g) provides:

> Actual capital expenditures and TDSIC costs that exceed the approved capital expenditures and TDSIC costs require specific justification by the public utility and specific approval by the commission before being authorized for recovery in customer rates.

Q: Within the context of your understanding of the term "best estimate," please describe your approach in analyzing prior TDSIC Plan and Compliance projects for cost support and its justification for project cost increases.

A: For my analysis of project cost increases, I relied on the Indiana Code sections cited above, and Commission Orders for what can be considered a "best estimate" of original costs for the original project definition.

The Commission's Order dated June 22, 2016 in Northern Indiana Public Service Company LLC ("NIPSCO"), Cause No. 44403 TDSIC-4, page 27, states "…in a Section 9 proceeding, a utility must update its approved plan and explain any changes in the best estimate of costs, necessity, or incremental benefits." The Order goes on to state: "[a] TDSIC best estimate should reflect, at a minimum, costs a utility reasonably could or should have foreseen at the time the estimate was created." *Id.* at page 28.

With regard to showing satisfactory reasons for increased cost estimates, the Commission stated in its Order dated March 30, 2016 in Vectren North, Cause No. 44430 TDSIC-3, page 5:

> [B]ecause our approval of the plan as reasonable was based on our determination of the best estimate of the cost of the eligible improvements, whether public convenience and necessity require the eligible improvements, and whether the estimated costs of the eligible improvements are justified by the incremental benefits, it seems reasonable that any update to the plan include changes to those factors we considered in approving the plan, i.e., changes in an eligible improvement's cost estimate, necessity, and associated benefits.

The Commission stated on page 20 of its Order dated January 28, 2015 in NIPSCO, Cause No. 44403 TDSIC-1: "[t]his does not mean that the utility may simply detail the reasons why the increase occurred. Rather, the utility must explain why the increase in best estimated costs (i.e., costs that were considered to be highly reliable) is reasonable or warranted under the circumstances presented." Furthermore, in the Commission's Order dated June 22, 2016 in NIPSCO, Cause No. 44403 TDSIC-4, page 28, the Commission stated:

> Whether the utility seeks to provide specific justification for approval of an increase in the best estimate at the time it seeks cost recovery or prior to incurring actual costs, the standard is the same. As we explained in the TDSIC-1 Order at 20, a utility may not simply detail the reasons for the increase in costs. Instead, it must explain why the increase in the best estimated cost, which was considered to be better than all others in quality or value, is reasonable or warranted under the circumstances presented.

In addition to TDSIC Projects, the OUCC will analyze Compliance Projects to determine if adequate explanations are provided to justify cost increases for approved projects. Within this context, the OUCC will review each project, paying particular

attention to projects with increased estimates, or if a project's actual costs exceed CEI South's previously approved best estimate.

Note: Attachment BRK-1, Page 1 is Confidential.

Note: Attachment BRK-1, Page 2 is Confidential.

Note: Attachment BRK-1, Page 3 is Confidential.

Note: Attachment BRK-1, Page 4 is Confidential.

Note: Attachment BRK-1, Page 5 is Confidential.

Note: Attachment BRK-1, Page 6 is Confidential.

AACE International Recommended Practice No. 18R-97

COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRUCTION FOR THE PROCESS INDUSTRIES

TCM Framework: 7.3 – Cost Estimating and Budgeting

Rev. March 1, 2016

Note: As AACE International Recommended Practices evolve over time, please refer to www.aacei.org for the latest revisions.

Contributors:

Disclaimer: The opinions expressed by the authors and contributors to this recommended practice are their own and do not necessarily reflect those of their employers, unless otherwise stated.

(March 1, 2016 Revision):
Larry R. Dysert, CCP CEP DRMP (Author)
Laurie S. Bowman, CCP DRMP EVP PSP
Peter R. Bredehoeft, Jr. CEP
Dan Melamed, CCP EVP
Todd W. Pickett, CCP CEP
Richard C. Plumery, EVP

(November 29, 2011 Revision):
Peter Christensen, CCE (Author)
Larry R. Dysert, CCC CEP (Author)
Jennifer Bates, CCE
Jeffery J. Borowicz, CCE CEP PSP
Peter R. Bredehoeft, Jr. CEP
Robert B. Brown, PE
Dorothy J. Burton
Robert C. Creese, PE CCE
John K. Hollmann, PE CCE CEP
Kenneth K. Humphreys, PE CCE
Donald F. McDonald, Jr. PE CCE PSP
C. Arthur Miller
Todd W. Pickett, CCC CEP
Bernard A. Pietlock, CCC CEP
Wesley R. Querns, CCE
Don L. Short, II CEP
H. Lance Stephenson, CCC
James D. Whiteside, II PE

AACE® International Recommended Practice No. 18R-97

COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRUCTION FOR THE PROCESS INDUSTRIES

TCM Framework: 7.3 – Cost Estimating and Budgeting

March 1, 2016

PURPOSE

As a recommended practice of AACE International, the *Cost Estimate Classification System* provides guidelines for applying the general principles of estimate classification to project cost estimates (i.e., cost estimates that are used to evaluate, approve, and/or fund projects). The *Cost Estimate Classification System* maps the phases and stages of project cost estimating together with a generic project scope definition maturity and quality matrix, which can be applied across a wide variety of process industries.

This addendum to the generic recommended practice (17R-97) provides guidelines for applying the principles of estimate classification specifically to project estimates for engineering, procurement, and construction (EPC) work for the process industries. This addendum supplements the generic recommended practice by providing:

- A section that further defines classification concepts as they apply to the process industries.
- A chart that maps the extent and maturity of estimate input information (project definition deliverables) against the class of estimate.

As with the generic recommended practice, the intent of this addendum is to improve communications among all of the stakeholders involved with preparing, evaluating, and using project cost estimates specifically for the process industries.

The overall purpose of this recommended practice is to provide the process industry with a project definition deliverable maturity matrix that is not provided in 17R-97. It also provides an approximate representation of the relationship of specific design input data and design deliverable maturity to the estimate accuracy and methodology used to produce the cost estimate. The estimate accuracy range is driven by many other variables and risks, so the maturity and quality of the scope definition available at the time of the estimate is not the sole determinate of accuracy; risk analysis is required for that purpose.

This document is intended to provide a guideline, not a standard. It is understood that each enterprise may have its own project and estimating processes and terminology, and may classify estimates in particular ways. This guideline provides a generic and generally acceptable classification system for process industries that can be used as a basis to compare against. This addendum should allow each user to better assess, define, and communicate their own processes and standards in the light of generally-accepted cost engineering practice.

INTRODUCTION

For the purposes of this addendum, the term “process industries” is assumed to include firms involved with the manufacturing and production of chemicals, petrochemicals, and hydrocarbon processing. The common thread among these industries (for the purpose of estimate classification) is their reliance on process flow diagrams (PFDs) and piping and instrument diagrams (P&IDs) as primary scope defining documents. These documents are key deliverables in determining the degree of project definition, and thus the extent and maturity of estimate input information.

Estimates for process facilities center on mechanical and chemical process equipment, and they have significant amounts of piping, instrumentation, and process controls involved. As such, this addendum may apply to portions of other industries, such as pharmaceutical, utility, water treatment, metallurgical, converting, and similar industries.

This addendum specifically does not address cost estimate classification in non-process industries such as commercial building construction, environmental remediation, transportation infrastructure, hydropower, "dry" processes such as assembly and manufacturing, "soft asset" production such as software development, and similar industries. It also does not specifically address estimates for the exploration, production, or transportation of mining or hydrocarbon materials, although it may apply to some of the intermediate processing steps in these systems.

The cost estimates covered by this addendum are for engineering, procurement, and construction (EPC) work only. It does not cover estimates for the products manufactured by the process facilities, or for research and development work in support of the process industries. This guideline does not cover the significant building construction that may be a part of process plants.

This guideline reflects generally-accepted cost engineering practices. This RP was based upon the practices of a wide range of companies in the process industries from around the world, as well as published references and standards. Company and public standards were solicited and reviewed, and the practices were found to have significant commonalities. These classifications are also supported by empirical process industry research of systemic risks and their correlation with cost growth and schedule slip[8].

COST ESTIMATE CLASSIFICATION MATRIX FOR THE PROCESS INDUSTRIES

A purpose of cost estimate classification is to align the estimating process with project stage-gate scope development and decision making processes.

Table 1 provides a summary of the characteristics of the five estimate classes. The maturity level of project definition is the sole determining (i.e., primary) characteristic of class. In Table 1, the maturity is roughly indicated by a percentage of complete definition; however, it is the maturity of the defining deliverables that is the determinant, not the percent. The specific deliverables, and their maturity or status are provided in Table 3. The other characteristics are secondary and are generally correlated with the maturity level of project definition deliverables, as discussed in the generic RP [2]. The post sanction classes (Class 1 and 2) are only indirectly covered where new funding is indicated. Again, the characteristics are typical and may vary depending on the circumstances.

	Primary Characteristic	*Secondary Characteristic*		
ESTIMATE CLASS	**MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgment, or analogy	L: -20% to -50% H: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-off	L: -3% to -10% H: +3% to +15%

Table 1 – Cost Estimate Classification Matrix for Process Industries

This matrix and guideline outline an estimate classification system that is specific to the process industries. Refer to the generic estimate classification RP[1] for a general matrix that is non-industry specific, or to other addendums for guidelines that will provide more detailed information for application in other specific industries. These will provide additional information, particularly the project definition deliverable maturity matrix which determines the class in those particular industries.

Table 1 illustrates typical ranges of accuracy ranges that are associated with the process industries. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically to achieve a 50% probability of project overrun versus underrun) for given scope. Depending on the technical and project deliverables (and other variables) and risks associated with each estimate, the accuracy range for any particular estimate is expected to fall into the ranges identified (although extreme risks can lead to wider ranges).

In addition to the degree of project definition, estimate accuracy is also driven by other systemic risks such as:

- Level of non-familiar technology in the project.
- Complexity of the project.
- Quality of reference cost estimating data.
- Quality of assumptions used in preparing the estimate.
- Experience and skill level of the estimator.
- Estimating techniques employed.
- Time and level of effort budgeted to prepare the estimate.
- Unique/remote nature of project locations and the lack of reference data for these locations.
- The accuracy of the composition of the input and output process streams.

Systemic risks such as these are often the primary driver of accuracy, especially during the early stages of project definition. As project definition progresses, project-specific risks (e.g. risk events) become more prevalent and also drive the accuracy range[3]. Another concern in estimates is potential pressure for a predetermined value that may

result in a biased estimate. The goal should be to always have an unbiased and objective estimate. The stated estimate ranges are dependent on this premise and a realistic view of the project.

Failure to appropriately address systemic risks (e.g. technical complexity) during risk analysis impacts the resulting probability distribution of the estimate costs, and therefore the interpretation of estimate accuracy.

Another way to look at the variability associated with estimate accuracy ranges is shown in Figure 1. Depending upon the technical complexity of the project, the availability of appropriate cost reference information, the degree of project definition, and the inclusion of appropriate contingency determination, a typical Class 5 estimate for a process industry project may have an accuracy range as broad as -50% to +100%, or as narrow as -20% to +30%.

Figure 1 also illustrates that the estimating accuracy ranges overlap the estimate classes. There are cases where a Class 5 estimate for a particular project may be as accurate as a Class 3 estimate for a different project. For example, similar accuracy ranges may occur if the Class 5 estimate of one project that is based on a repeat project with good cost history and data and, whereas the Class 3 estimate for another is for a project involving new technology. It is for this reason that Table 1 provides ranges of accuracy range values. This allows application of the specific circumstances inherent in a project, and an industry sector, to provide realistic estimate class accuracy range percentages. While a target range may be expected of a particular estimate, the accuracy range is determined through risk analysis of the specific project and is never pre-determined. AACE has recommended practices that address contingency determination and risk analysis methods.

If contingency has been addressed appropriately, approximately 80% of projects should fall within the ranges shown in Figure 1. However, this does not preclude a specific actual project result from falling inside or outside of the bands shown in Figure 1 indicating the expected accuracy ranges.

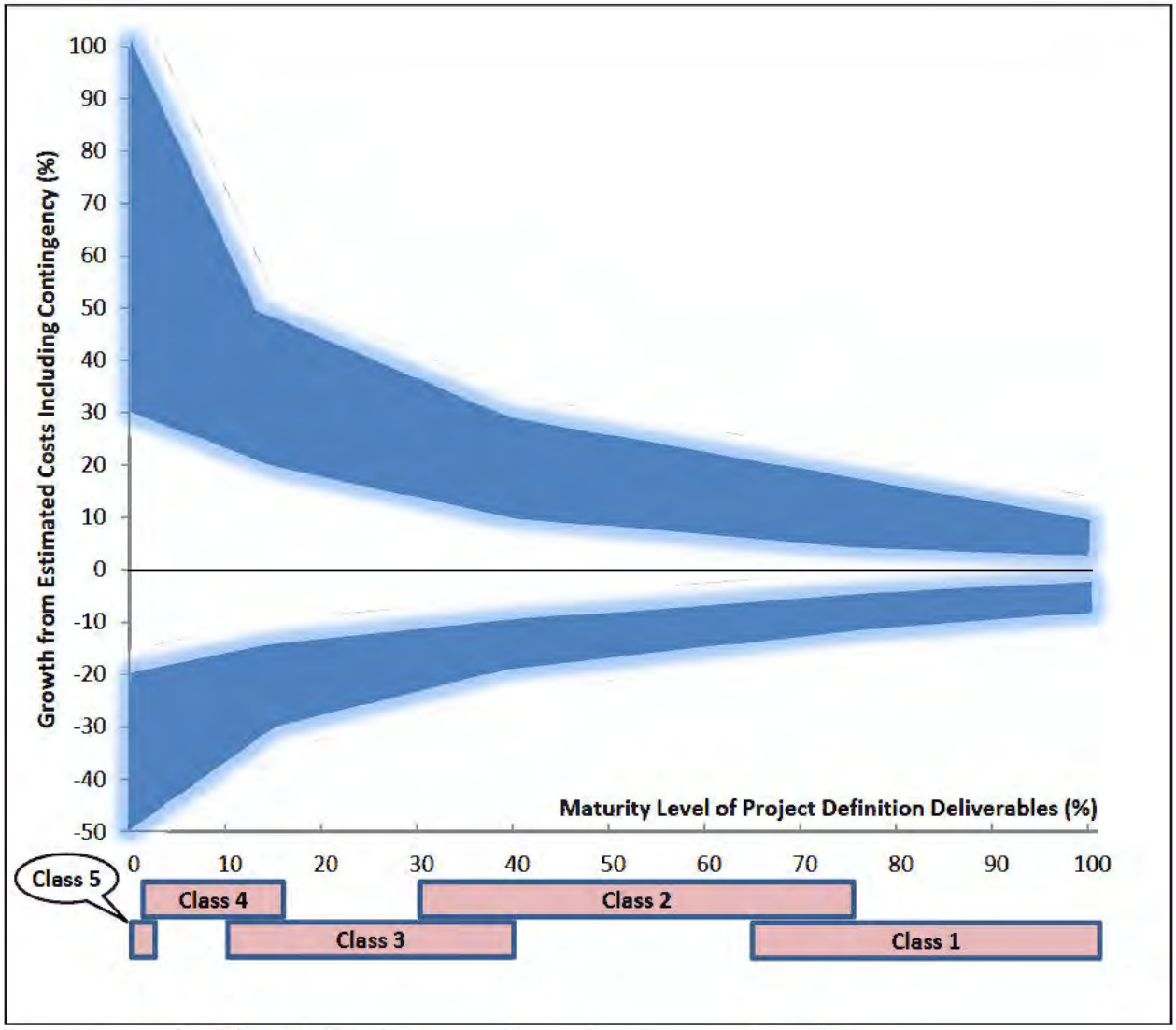


Figure 1 – Example of the Variability in Accuracy Ranges for a Process Industry Estimate

DETERMINATION OF THE COST ESTIMATE CLASS

The cost estimator makes the determination of the estimate class based upon the maturity level of project definition based on the status of specific key planning and design deliverables. The percent design completion may be correlated with the status, but the percentage should not be used as the estimate class determinant. While the determination of the status (and hence the estimate class) is somewhat subjective, having standards for the design input data, completeness and quality of the design deliverables will serve to make the determination more objective.

AFFIRMATION

I affirm, under the penalties for perjury, that the foregoing representations are true.

Brien R. Krieger

Brien R. Krieger
Utility Analyst II
Indiana Office of
Utility Consumer Counselor
45612
CenterPoint Energy Indiana South

12/2/21

Date

CERTIFICATE OF SERVICE

This is to certify that a copy of the foregoing ***OUCC'S PUBLIC READATED TESTIMONY OF BRIEN R. KRIEGER*** has been served upon the following counsel of record in the captioned proceeding by electronic service on December 2, 2021.

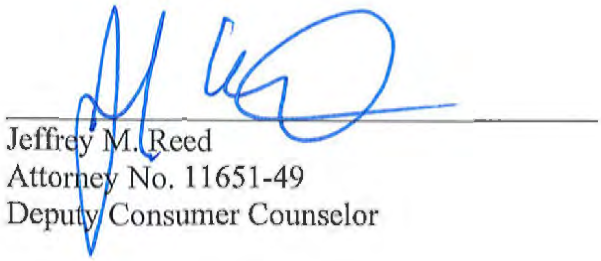
Heather A. Watts
Jeffery A. Earl
CENTERPOINT ENERGY, INC.
Email:Heather.Watts@centerpointenergy.com
Email: jeffery.earl@centerpointenergy.com

Nicholas K. Kile
Hillary J. Close
Lauren M. Box
Barnes & Thornburg LLP
Email: nicholas.kile@btlaw.com
hillary.close@btlaw.com
lauren.box@btlaw.com

Michelle D. Quinn
Katie J. Tieken
INDIANA GAS COMPANY, INC. d/b/a CENTERPOINT ENERGY INDIANA NORTH
Email:
Michelle.quinn@centerpointenergy.com
Email: Katie.tieken@centerpointenergy.com

Jennifer A. Washburn
Citizens Action Coalition
Email: jwashburn@citact.org

With a copy to:
Reagan Kurtz
Citizens Action Coalition
Email: rkurtz@citact.org



Jeffrey M. Reed
Attorney No. 11651-49
Deputy Consumer Counselor

INDIANA OFFICE OF UTILITY CONSUMER COUNSELOR
115 West Washington Street
Suite 1500 South
Indianapolis, IN 46204
infomgt@oucc.in.gov
317/232-2494 – Telephone
317/232-5923 – Facsimile