

Application: A.17-04-XXX

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Witnesses: Snyder; Swartz

**PREPARED DIRECT TESTIMONY OF  
CHARLIE SNYDER AND CHRISTOPHER SWARTZ  
ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY**

**CHAPTER 2**



**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

**APRIL 28, 2017**

**TABLE OF CONTENTS**

1

2 I. INTRODUCTION .....1

3 II. THE CURRENT ENVIRONMENT AND SDG&E’S LEGACY CIS .....1

4 A. Overview of the Current Environment (Swartz) .....1

5 B. SDG&E’s Legacy CIS (Swartz) .....3

6 (i) Customization of the Legacy CIS (Swartz).....6

7 (ii) Addition of Subsystems (Swartz) .....9

8 C. Current Challenges Resulting from Reliance on the Legacy CIS

9 (Swartz/Snyder) .....11

10 (i) Data Proliferation Across the Legacy CIS and Subsystems (Snyder).....11

11 (ii) Delays in Implementation of Mandated Rate Changes (Snyder) .....12

12 (iii) Delayed Customer Bills (Swartz) .....17

13 (iv) Need for Replacement of Legacy CIS is Urgent (Swartz) .....19

14 III. CONCLUSION.....20

15 IV. STATEMENT OF QUALIFICATIONS .....21

16

1 **PREPARED DIRECT TESTIMONY OF**  
2 **CHARLIE SNYDER AND CHRISTOPHER SWARTZ**

3 **CHAPTER 2**

4 **I. INTRODUCTION**

5 The purpose of this direct testimony is to provide an overview of San Diego Gas &  
6 Electric Company's ("SDG&E's") current Customer Service Application portfolio, including the  
7 legacy Customer Information System ("CIS") and the supporting subsystems, and to describe the  
8 limitations and challenges of these current systems. The witness sponsoring the testimony in  
9 each section below is noted in a parenthetical following each section heading.

10 SDG&E's legacy CIS is the central system used to manage essential functions such as  
11 billing and payment processing, credit, service orders and outages, customer information and  
12 other applications. The system, implemented in 1997, is two decades old and is quickly nearing  
13 obsolescence. As discussed in more detail below, industry changes, as well as the evolution of  
14 public policy objectives and customer expectations, have placed increasing strain on the legacy  
15 CIS and its subsystems, and more recently, have created challenges that demand a near-term  
16 solution.

17 **II. THE CURRENT ENVIRONMENT AND SDG&E'S LEGACY CIS**

18 **A. Overview of the Current Environment (Swartz)**

19 The energy industry landscape in California has changed dramatically over the past 10  
20 years. Long a leader in shaping global energy policy, California has been at the forefront of the  
21 effort to encourage and expand demand response, distributed generation, energy efficiency and  
22 clean energy options for California consumers. SDG&E has been a strong partner in  
23 implementing the State's policy goals, supporting significant growth in innovative programs and

1 specialized tariff offerings, and promoting its customers' ability to access new services. For  
2 example, 10 years ago, SDG&E had fewer than 7,000 customers participating in its Net Energy  
3 Metering ("NEM") program compared with over 100,000 customers participating in the NEM  
4 program today.<sup>1</sup> In addition, complex variations of the NEM program have emerged over the  
5 last five years, including Virtual Net Metering (Schedules VNM-A and NEM-V) and Net Energy  
6 Metering Aggregation, both of which have also experienced a rapid rate of customer adoption.  
7 As another example, 10 years ago, SDG&E had just a handful of customers participating in  
8 electric vehicle ("EV") programs and rates compared with just under 10,000 customers who are  
9 participating today.

10 Looking forward, new and evolving tariff and program offerings (*e.g.*, EV, energy  
11 storage, EcoChoice, etc.) will continue to add complexity to a wide range of customer service  
12 transactions handled by SDG&E's systems. As public policy encourages more rate options and  
13 increased customer participation in energy solutions, CIS system changes that are necessary to  
14 support implementation of the State's energy policies will likely increase at a rapid pace. As  
15 SDG&E's customers continue to pursue existing and new program options, they will rely on  
16 enabling tools and services from SDG&E to better understand their energy usage, costs and  
17 needs.

18 In addition, there has been a sea of change within the past 10-20 years in the model for  
19 effective customer service. Customers have always expected friendly, efficient and reliable  
20 service, but with the development of new technologies, customers increasingly expect a  
21 customer-centric, individualized experience similar to that offered in other industries (*e.g.*, retail,  
22 media, telecommunications, etc.). In the current environment, a positive customer experience

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<sup>1</sup> Includes customers currently taking service under Schedules NEM and NEM-ST (successor tariff).

1 entails a seamless “one-stop shop” transaction, with the ability to interact online and through  
2 mobile devices and social media, and to access self-service solutions for traditional service  
3 transactions such as service turn-on or bill payment. As discussed in Chapter 1, SDG&E has  
4 consistently strived to achieve excellence in customer care, but the challenge of maintaining that  
5 standard increases as the bar of customer expectations is raised over time.

6 Like many other utilities in the United States, SDG&E is running up against the  
7 limitations of its technologically outdated CIS. TMG Consulting has published data  
8 demonstrating rising concern among utilities nationwide regarding obsolescence of customer  
9 information systems due to their age, and an inability to meet customer needs (especially for  
10 digital interactions) and to respond to advances in technology.<sup>2</sup> With its current legacy CIS,  
11 SDG&E is incurring increasingly higher costs to retrofit its existing mainframe-based system to  
12 keep pace with market changes and customer demands. As discussed below, as necessary  
13 changes to the legacy CIS system have grown in complexity and frequency, each modification to  
14 the legacy CIS has presented a greater challenge and an increased risk of system failure. Recent  
15 difficulties with the legacy CIS and its subsystems highlight the disconnect between the demands  
16 of the current environment and the functionality and capabilities of the system.

17 **B. SDG&E’s Legacy CIS (Swartz)**

18 SDG&E’s Customer Service Application portfolio is a grouping of 56 systems that are  
19 used to support the business functions and technical capabilities behind SDG&E’s customer  
20 service activities. The systems in this portfolio provide services that range from online customer

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<sup>2</sup> See, Direct Testimony of Witness Snyder (Chapter 3), Attachment C – “TMG Consulting – A CIS Survey and Industry Perspective,” slides 11 and 17. The TMG Consulting survey shows that 73 percent of the utilities surveyed have either already replaced their CIS within the past six years (25 percent) or will complete replacement of their CIS within the next four years (48 percent).

1 self-service to back office billing exception processing to managing the energy efficiency rebate  
2 program for customers. The core system in this portfolio is SDG&E’s legacy CIS, which is  
3 COBOL-based software<sup>3</sup> that is used primarily to support business functions such as metering,  
4 billing, credit, service orders, finance and revenue reporting. In addition, this software also  
5 processes customer data, such as a customer’s contact information and energy usage. The legacy  
6 CIS uses mainframe processing technology, where a high-performance computer is used for all  
7 of the computing. The mainframe allows SDG&E to execute many programs simultaneously to  
8 meet the large-scale processing needs. The mainframe hardware is a collection of servers that  
9 reside at a physical location at a shared worksite with SDG&E’s sister company, the Southern  
10 California Gas Company.

11           The legacy CIS was intended to support the business processes that were in place at the  
12 time the system was implemented. When SDG&E’s legacy CIS was implemented in 1997,  
13 SDG&E billed over 99.9% of customers using meter reads that were obtained by sending meter  
14 readers out into the field on a monthly basis to manually read each meter.<sup>4</sup> The legacy system is  
15 “premise-based,” meaning that the data collected indicates energy usage by a specific building or  
16 residence, as opposed to the “customer-based” approach currently used by more technologically  
17 advanced CIS’s, which focus on understanding energy usage on a customer-specific (rather than  
18 premise-specific) basis. Thus, the functionality required of the legacy CIS was limited to  
19 processing the monthly meter reads and providing basic details regarding the customer’s energy  
20 usage and location, as well as implementing and supporting Direct Access.<sup>5</sup>

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<sup>3</sup> Common Business-Oriented Language (“COBOL”).

<sup>4</sup> This percentage includes the small number of customers who were on a Time-Of-Use (“TOU”) rate.

<sup>5</sup> See, Decision (“D.”) 95-12-063, as modified by D.96-01-009.

1           Within the Customer Service Application portfolio, the legacy CIS interacts with 56  
2 subsystems to provide the functionality that SDG&E uses to meet its customers' needs.<sup>6</sup> Of  
3 these 56, there are four key subsystems including: (i) the Customer Relationship Management  
4 ("CRM") system used to support business processes for energy efficiency, demand response and  
5 customer communications; (ii) the Meter Data Management System ("MDMS") used to validate  
6 and process register reads and interval data coming from SDG&E's advanced metering  
7 infrastructure ("AMI") network; (iii) the Service Order Routing Technology ("SORT") system  
8 used to manage field orders and dispatch; and (iv) the MyAccount system used for online  
9 interactions with the customer, such as bill presentment and payment, online energy management  
10 and other self-service applications. These subsystems have extensive technical integrations with  
11 the legacy CIS to ensure that data is being passed accurately and timely between the systems.

12           As the energy industry has evolved over the past two decades, the amount of data  
13 required to support billing and customer engagement has grown exponentially. With the  
14 implementation of AMI, for example, SDG&E is now receiving daily register reads as well as  
15 15-minute or hourly interval data for all of its electric services<sup>7</sup> and daily register reads for gas  
16 services.

17           In 1997, small business and residential customers had only one data point per meter per  
18 month for billing purposes, equating to around 2.2 million points of data that needed to be stored  
19 monthly in the legacy CIS. Today, the legacy CIS stores over 720 electric and 30 gas data points  
20 for residential customers' meters and over 2,880 electric and 30 gas data points for business

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<sup>6</sup> Witness Linder's direct testimony (Chapter 6) provides a list displaying the 56 subsystems in workpaper "DL- CIS Replacement Program -AS IS."

<sup>7</sup> For the residential sector, SDG&E receives hourly readings; for the commercial, industrial, and agricultural sectors, SDG&E receives 15-minute readings.

1 customers' meters per month. This equates to almost 1.4 billion data points per month that are  
2 currently being stored in the legacy CIS.

3 To keep up with this exponential growth in data and to comply with regulatory mandates  
4 and customer needs over the past 20 years, SDG&E has developed solutions through  
5 (i) customization of its legacy CIS; and/or (ii) addition of specialized subsystems for the  
6 incremental required functionality. By using these approaches, SDG&E has met customer needs,  
7 including ensuring that its customers receive accurate bills. Increasingly, however, both  
8 approaches give rise to significant concerns regarding costs, implementation timelines, additional  
9 system complexity and other issues.

10 (i) *Customization of the Legacy CIS (Swartz)*

11 Due to limitations with the technology, any customized change made to SDG&E's legacy  
12 CIS requires Information Technology ("IT") coding changes to the core programs and tables  
13 within the system. SDG&E's legacy CIS is coded in the COBOL programming language, which  
14 was popular during the 1970s and 1980s, but has since been largely replaced by more flexible,  
15 easy-to-use programming languages. Continued customization over the past 20 years has led to  
16 the creation of additional COBOL code logic authored by various programmers into numerous  
17 modules and core functions now being used to support SDG&E's Customer Services operations.

18 Over time, extensive changes to the legacy CIS have been necessary to ensure  
19 compliance with Commission directives and to meet other regulatory, customer and business  
20 needs. Examples of Commission decisions that required customization of SDG&E's legacy CIS  
21 include:

- 22 • Advanced Metering Infrastructure<sup>8</sup>

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<sup>8</sup> See, D.07-04-043.



- 1           • Net Energy Metering (“NEM”)<sup>9</sup>
- 2           • Dynamic Pricing<sup>10</sup>
- 3           • Virtual Net Metering<sup>11</sup>
- 4           • Net Energy Metering Aggregation<sup>12</sup>

5           These initiatives led to new customer offerings that were not contemplated during the  
6 development of SDG&E’s legacy CIS architecture. To meet corollary customer needs, SDG&E  
7 dramatically customized the core architecture of the legacy CIS, including creating new  
8 programs for processing and new tables for data storage.

9           For example, in 2006, when SDG&E reconfigured its legacy CIS to accommodate  
10 NEM,<sup>13</sup> SDG&E re-architected the legacy CIS to accept meter reads that could be less than the  
11 meter read received the previous month (net generation). This effort included, among numerous  
12 other changes, creating a new transaction in the legacy CIS to allow back office personnel to  
13 configure a customer’s premise for NEM service. This new transaction included information  
14 about the customer’s solar energy system, as well as the corresponding billing dates needed for  
15 the NEM program (installation date, effective billing date, annual true-up date, etc.). This new  
16 transaction and the supporting tables and programs enabled billing once the back office  
17 personnel entered the information into the CIS. Although this specific change in itself was not  
18 highly complex, the additional programs and tables for NEM services must be maintained and

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<sup>9</sup> NEM was originally adopted in California in 1995 pursuant to Senate Bill (“SB”) 656 (Stats. 1995, ch.369).

<sup>10</sup> See, D.12-12-004.

<sup>11</sup> Established in D.08-10-036 and expanded under D.11-07-031.

<sup>12</sup> See, Resolution E-4610.

<sup>13</sup> Prior to 2006, SDG&E billed NEM customers using a manual billing process outside of its legacy CIS.

1 updated with each future change to the legacy CIS. For example, when Net Surplus  
2 Compensation was established under Assembly Bill 920,<sup>14</sup> the new NEM programs and tables  
3 had to be updated, adding another layer of complexity to an already highly customized legacy  
4 CIS system.

5         With each new approved regulatory change, SDG&E implemented the required  
6 functionality by layering more customization onto the previously customized program or table.  
7 When it was practical to do so, SDG&E would leverage the same IT programmer who made the  
8 previous change to help keep the coding consistent within the program. However, as time passed  
9 and employees moved on, other resources not as familiar with the original customization were  
10 tasked to code changes to the legacy CIS, sometimes leading to inconsistent and redundant  
11 coding. This process of building customization on top of customization has continued over the  
12 past 20 years to the point where the current state system architecture and functionality are so  
13 complex that making any changes is often costly and resource intensive and requires a long  
14 implementation window.

15         As this cycle has repeated and the customization has drifted further away from the core  
16 legacy CIS architecture, the costs and complexity have continued to rise. As a comparison point,  
17 as part of its 2008,<sup>15</sup> 2012<sup>16</sup> and 2016<sup>17</sup> General Rate Case (“GRC”) Phase 2 implementations,  
18 SDG&E has needed to customize its legacy CIS to accommodate the authorized changes to  
19 existing rate structures and to implement new rate structures. While some variance is to be  
20 expected between the implementations based on the overall number of changes, the total

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<sup>14</sup> As established in D.11-06-016.

<sup>15</sup> See, Application (“A.”) 07-05-007.

<sup>16</sup> See, A.10-12-005.

<sup>17</sup> See, A.15-04-012.

1 implementation costs should be relatively similar. Instead, due to the continued customization  
2 and subsequent complexities described above, SDG&E has seen the costs for these  
3 implementations skyrocket, with its 2016 implementation costing nearly 5 times the 2012  
4 implementation. Table Ch2-1 below provides the total costs for each of these implementations.

5 **Table Ch2-1: Comparison of GRC Phase 2 Implementation Costs**  
6

7

SDG&E GRC Phase 2	2008	2012	2016 <sup>18</sup>
Implementation Costs (millions)	\$1.0	\$2.5	\$11.5

8  
9  
10  
11  
12

13 In addition, the high level of customization has made it difficult to make changes quickly;  
14 it is often faster and more cost effective to implement a new subsystem than modifying the  
15 legacy CIS. The general prevalence of subsystems, discussed below, further increases IT and  
16 business team support costs due to increased training, performance management, administration,  
17 timelines to implement system fixes and changes, efforts for system and regression testing, and  
18 complex and difficult to share documentation.

19 *(ii) Addition of Subsystems (Swartz)*

20 With the introduction of new business functions and the high costs of customizing the  
21 legacy CIS system, SDG&E has leveraged the use of subsystems that then integrate with the  
22 legacy CIS. However, over the years, the subsystems and interfaces to SDG&E's legacy CIS  
23 have become highly complex and are concurrently dependent upon both older and newer  
24 technologies, resulting in increased costs and longer implementation timelines for any needed  
25 changes.

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<sup>18</sup> As this proceeding is still being litigated, costs are estimated based upon SDG&E's proposals. Costs also include changes required under D.17-01-006. Costs do not include SDG&E's proposed costs for dimmable streetlight and ancillary device rate options.

1 In addition, the business processes currently being supported by the subsystems have  
2 created a decentralized architecture that has made it complex and costly for SDG&E to  
3 continually provide a strong and consistent customer experience. In today's world, without a  
4 360-degree view of the customer (*i.e.*, all customer information visible in a consolidated  
5 location), an Energy Services Specialist ("ESS") in SDG&E's Customer Contact Center  
6 ("CCC") must access data from several different systems while taking a customer call, as a  
7 customer's questions may range from their current rate options to an energy rebate letter they  
8 received for an appliance. Moreover, due to the decentralized CIS architecture, transactions such  
9 as high bill inquiries often require multiple steps and handoffs to various business units before  
10 they can be resolved.

11 Similar to the legacy CIS, an increasing number of subsystems, such as the online self-  
12 service system, MyAccount, and the customer relationship management system, CRM, are also  
13 becoming outdated or obsolete, which increases the risk of system failure. Also, similar to the  
14 legacy CIS, to meet SDG&E's customer needs, these key subsystems have experienced a high  
15 amount of customization, which has correspondingly increased the costs and timelines required  
16 to make changes, as well as the risk of system failure. Over the past 18 months, SDG&E has  
17 seen a rise in the number of legacy CIS and subsystem outages, related to, among other things,  
18 the increased complexities and numerous integrations between the systems. These outages have  
19 directly impacted customers, such as with SDG&E's MyAccount system, where the system was  
20 either partially or completely down for nearly 600 total hours over the course of this period. This  
21 prevents customers from being able to either log in, view their energy usage, compare pricing  
22 plans or pay their bill. In addition, mainframe processing issues or "abends," requiring manual  
23 IT resolution, have increased 600% since the end of 2015. Also, SDG&E has preset time tables

1 and corresponding Service Level Agreements (“SLAs”) for each of its IT processes and/or jobs  
2 and in 2016 saw more SLAs missed than in the previous years combined.

3 **C. Current Challenges Resulting from Reliance on the Legacy CIS**  
4 **(Swartz/Snyder)**

5 Whether it is the aging infrastructure with capacity limitations or the declining skill base  
6 with knowledge of SDG&E’s heavily customized legacy CIS, the deficiencies of the legacy CIS  
7 system will only become more pronounced with time. The complexity of SDG&E’s legacy  
8 architecture, consisting of a highly customized CIS and multiple supporting subsystems, has  
9 caused an exponential increase in both the time required and cost of its recent regulatory  
10 implementations. Continued modifications of the legacy CIS and supporting subsystems have  
11 resulted in degraded system performance, increased complexity, and the need for manual  
12 intervention to maintain them. In addition to cost and operational impacts, SDG&E has faced  
13 unprecedented problems with implementation of mandated rate changes and delays in issuance  
14 of customer bills. All of these challenges make it clear that the need to replace the legacy CIS is  
15 urgent.

16 (i) *Data Proliferation Across the Legacy CIS and Subsystems (Snyder)*

17 SDG&E’s goal of providing digital solutions that offer simple, fast, and easy-to-use  
18 functions for the customer and internal end user (*e.g.*, ESS’s and back office personnel) is  
19 difficult and costly to achieve due to substantial data proliferation in back-end subsystems.  
20 SDG&E’s complicated data landscape is a contributing factor to the costs associated with  
21 reporting and analytics. Because there is no consolidated data architecture or store that provides  
22 employees with a customer-centric view (*i.e.*, including contacts, technical master data, usage  
23 data, billing and payment history, service request history, etc.), employees must pull data from

1 multiple reporting and analytical platforms, which can create inconsistency and additional  
2 support costs.

3 Extensive data proliferation has created multiple operational challenges for SDG&E  
4 including:

- 5 • Decentralized customer information creating exceptions<sup>19</sup> and lengthier customer  
6 service resolution times;
- 7 • Increased time required for employees to find and retrieve customer information  
8 across multiple systems, such as customer email addresses, internally exchanged  
9 emails related to service transactions, and interval usage data that can be related back  
10 to customer data;
- 11 • Additional resources required to manage multiple data stores constantly increasing in  
12 size and complexity;
- 13 • Slower network and application performance due to excess traffic as employees  
14 search against multiple systems for the information they need;
- 15 • High costs required to operate growing storage hardware; and
- 16 • Multiple systems using different data models containing customer information (*e.g.*,  
17 contact information) result in integration complexities for the development of  
18 streamlined internal and customer-facing applications.

19 (ii) *Delays in Implementation of Mandated Rate Changes (Snyder)*

20 The following table provides the main regulatory-driven legacy CIS system projects that  
21 SDG&E implemented in 2015 and 2016. In addition, to provide a full picture of completed

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<sup>19</sup> Internal work items created when system or customer data does not meet expected parameters. For example, an exception would be created if not all of the required data was transferred from one system to another.

1 activities, SDG&E has listed other projects undertaken that, although not explicitly mandated in  
 2 a Commission decision or resolution, illustrate the number of significant changes made.  
 3 Together, these two groups of projects represent an unprecedented amount of work to be  
 4 completed in such a short period of time – a volume of work significantly in excess of a  
 5 business-as-usual scenario.

6 The table below outlines the recent regulatory projects (both Commission-mandated and  
 7 others) that impacted the legacy CIS and subsystems:

8 **Table Ch2-2: Legacy CIS Implementation Projects Implemented**  
 9 **April 2015 through December 2016**

Description	Work Initiated	Project Implemented	Notes
<b><i>Mandated Projects</i></b>			
Residential Rate Reform (“RROIR”) Tier 3 Collapse	Jan. 2015	Sept. 2015	D.15-07-001, Ordering Paragraph (“OP”) 4
Smart Pricing Program - Small/Medium Business Default to Critical Peak Pricing (“CPP”) Rates; Mandatory Time-Of-Use (“TOU”) Rates	Jan. 2011	Nov. 2015 - April 2016	D.12-12-004, OP 4; default date extended by Energy Division
RROIR - Opt in TOU Pilot Rates 1&2	Sept. 2015	June / July 2016	D.15-07-001; R.12-06-013, September 24, 2015 ruling for menu of pilot rates
NEM 2.0 Successor Tariff	Dec. 2015	June 2016	D.16-01-044
RROIR - Collapse to 2 Tiers	Sept. 2015	July 2016	D.15-07-001, OPs 4, 5
2016 GRC Phase 1 Rate Change	July 2016	Aug. 2016	D.16-06-054
RROIR - Opt in TOU Pilot Rate 3	April 2016	Oct. / Nov. 2016	D.15-07-001; R.12-06-013, September 24, 2015 ruling for menu of pilot rates
Green Tariff Shared Renewables Program - EcoChoice Green Tariff	Jan. 2015	Nov. 2016	D.15-01-051
NEM 2.0 Non-Bypassable	July 2016	Dec. 2016	D.16-01-044

Description	Work Initiated	Project Implemented	Notes
Charges Calculation Changes			
Annual Rate Change	Dec. 2016	Jan. 2017	
<b><i>Other Projects</i></b>			
Delayed Bill Plan – Release 1	May 2016	July-Dec. 2016	

1  
2 Attachment A to this testimony (“Attachment A - Legacy CIS Projects Through  
3 December 2019”) outlines the ongoing regulatory projects (both Commission-mandated and  
4 others) that are slated for completion between 2017 and 2019. The implementation dates  
5 presented reflect updates to those that were originally presented in the November status report as  
6 part A.15-04-12.<sup>20</sup> As noted in that report, the dates of these implementations are subject to  
7 change.

8 The unprecedented number of new rates and changes to existing rate structures  
9 implemented over the past 28 months has significantly impacted the performance of SDG&E’s  
10 legacy CIS. While SDG&E has historically made 4 to 5 of these significant changes to its legacy  
11 CIS per year, more than 30 significant changes will be made between 2016 and 2019, as  
12 illustrated in Tables Ch2-2 and Attachment A. Work to implement new rates usually is  
13 conducted in parallel with the pendency of the relevant proceeding. More recently, however,  
14 SDG&E has been unable to begin implementation of new rates in a timely manner due to

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<sup>20</sup> In A.15-04-12, “Application of San Diego Gas and Electric Company (U 902 E) For Authority to Update Marginal Costs, Cost Allocation, And Electric Rate Design,” due to implementation challenges, SDG&E was required to submit a status report on the implementation delay SDG&E reported on November 28, 2016. This status report responded to questions that Administrative Law Judges Cooke and McKinney raised at the November 29 evidentiary hearings. The status report provided by SDG&E: (1) included a listing of the other regulatory requirements impacting the schedule; (2) addressed questions regarding the resources needed to implement the rates; (3) addressed the possibility of a phased approach; and (4) identified the potential impacts to other active proceedings. In addition, SDG&E also provided a revised implementation schedule adjusting for the delays caused by the complexity and the significant resourcing needed to make these changes in its legacy CIS.



1 competing demands related to separate proceedings and operational challenges. In the case of  
2 new rates established as part of SDG&E's GRC Phase 2 proceeding,<sup>21</sup> work to implement the  
3 new rates was stalled because implementation teams were addressing delayed billing issues  
4 (discussed below) and implementing a multitude of other regulatory requirements (*e.g.*, TOU  
5 Pilot Rate 3, EcoChoice Green Tariff, NEM non-bypassable charges, Rate Reform High Usage  
6 Charge, Legacy Interval Data System automation and NEM Aggregation automation).

7 As discussed herein, making changes to SDG&E's legacy CIS for these implementations  
8 has shown to be both costly and time consuming. For example, the changes necessary to default  
9 SDG&E's small and medium business customers to new rates (Smart Pricing Programs, Critical  
10 Peak Pricing) required over two years to implement and involved 50 resources at peak.<sup>22</sup>

11 The simultaneous implementation of the requirements for each of the mandated projects  
12 listed above has placed a tremendous strain on the legacy CIS. As discussed above, the legacy  
13 CIS system has been heavily customized over the years, making each new or revised business  
14 capability harder to implement. Program or rate changes often involve additional hard-coding to  
15 the system to meet specific business needs, which limits the ability for future projects to be  
16 configurable. Over the years, a significant amount of hard-coding has occurred in the billing  
17 area, which has resulted in each subsequent billing project being more difficult to implement due  
18 to the exceptions built throughout the system. Thus, with additional complexity incorporated  
19 into the system, the time necessary to implement new rates and other changes has increased  
20 significantly.

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<sup>21</sup> See A.15-04-012.

<sup>22</sup> See Advice Letter 3007-E/2532-G, p. 3 (submitted November 18, 2016 and awaiting Commission approval).

1 Managing the changes being introduced into the system requires detailed analysis,  
2 design, coding and testing as part of the implementation process. When new capabilities are  
3 introduced, additional time is needed to perform comprehensive cycles of testing to ensure  
4 existing CIS functions are not negatively impacted. Moreover, aside from the difficulties  
5 inherent in implementing changes in the legacy CIS, it is important to note that regulatory  
6 projects usually impact multiple business functions and require complex integration between  
7 multiple subsystems including, but not limited to, the legacy CIS, CRM, MyAccount (including  
8 the online energy management tools), the Centralized Calculation Engine (“CCE”),<sup>23</sup> the MDMS  
9 and the Smart Energy Advisor Desktop (“SEAd”).<sup>24</sup> Each of these systems must be included in  
10 the design, build and test of any solution. This prolongs the time required to implement new or  
11 revised rates.

12 The extraordinary nature of the exponential increase in the functionality and capabilities  
13 demanded of the legacy CIS over the past 28 months cannot be overstated. To provide some  
14 perspective, in September 2015, SDG&E had less than 40,000 customers on a TOU rate; by the  
15 end of 2016, the number of TOU customers had grown to over 150,000, primarily due to the  
16 defaulting of small and medium businesses to Smart Pricing Programs (“SPP”) or Critical Peak  
17 Pricing (“CPP”) rate schedules. This number will continue to exponentially grow, as residential  
18 customers are defaulted to TOU rates in 2018 and 2019.

19 Historically, SDG&E has been successful in meeting its implementation deadlines.  
20 Increasingly, however, SDG&E is encountering significant challenges and has been forced to

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<sup>23</sup> Provides internal functionality to perform “what-if” analyses and bill impacts related to comparisons of SDG&E rates.

<sup>24</sup> Provides functionality for a unified, process-centric desktop for the ESS’s in the CCC and branch offices. These systems are further defined in the direct testimony of Witness Linder (Chapter 6).

1 request extensions of implementation deadlines. As noted above, SDG&E recently proposed a  
2 revised implementation schedule for its GRC Phase 2 proceeding to adjust for the delays caused  
3 by the complexity and the significant resourcing needed to make all of the mandated changes to  
4 its legacy CIS. In addition, as illustrated in Attachment A, there are multiple ongoing  
5 Commission proceedings that could potentially be impacted by the implementation issues. In  
6 particular, the Residential TOU Default pilot will be a significant effort in 2017 and faces  
7 challenges due to the current state of the legacy CIS. SDG&E also expects to pursue three other  
8 applications in 2017 that contain substantial elements of rate design that will require billing  
9 implementation upon approval:

- 10 • SDG&E's electric vehicle filing pursuant to SB 350
- 11 • SDG&E's 2019 GRC Phase 2 Application
- 12 • SDG&E's Residential Rate Design Window Application

13 The outdated and archaic nature of SDG&E's legacy CIS presents a material threat to  
14 timely implementation of these and other necessary system changes. While SDG&E will  
15 continue to work diligently to meet all of its mandated implementations, the realities of the  
16 extensive costs and time required to implement changes to the legacy CIS system cannot be  
17 ignored. To ensure that SDG&E is able to meet all implementation timelines established by the  
18 Commission in furtherance of the State's policies and that SDG&E customers have access to  
19 new and beneficial tariffs and programs, it is critical that SDG&E's legacy CIS system  
20 challenges be addressed and resolved as soon as possible.

21 (iii) *Delayed Customer Bills (Swartz)*

22 In Q1 2016, SDG&E began to experience an increase in the number of delayed customer  
23 bills due to the complexities inherent in implementing the mandated regulatory initiatives

1 detailed in Table Ch2-2 above. To accommodate these implementations, significant  
2 customizations were made to SDG&E's legacy CIS, such as with the Bill Protection billing  
3 calculation related to the Smart Pricing Program, which required two separate rate calculations  
4 for all defaulted customers. The significant and numerous changes made to the legacy CIS in  
5 late 2015 and in the first half of 2016 caused a marked increase in the number of delayed bills in  
6 the subsequent months, with labor-intensive manual fixes necessary in many instances to  
7 generate customer bills.

8         As discussed above, the legacy CIS's age and instability causes compliance with new  
9 requirements to be time and resource-intensive, often requiring manual processing. Due to the  
10 number of customized jobs and programs, the failure rate of standard, overnight processing jobs  
11 has increased significantly from 2015 to 2016. When a failure in overnight processing occurs, an  
12 IT programmer must assess the error to create a work around to re-start the processing. This can  
13 cause billing delays. In addition, this causes the evening processing window to extend into  
14 normal business hours, which impacts the normal, daily work performed by SDG&E employees,  
15 causing further delay.

16         SDG&E has worked diligently to remedy its customer bill issues. SDG&E has also  
17 remained focused on working within the legacy CIS to devise fixes to lower the risk of this type  
18 of incident going forward. However, it is now clear that the system itself is the problem – it does  
19 not have the long-term capabilities to meet the increasingly complex requirements related to  
20 customer programs and rates that are needed in future years. As a practical matter, the risk of  
21 CIS system failure and billing delays will continue to exist until SDG&E replaces its obsolete  
22 legacy CIS with a CIS designed to meet the far more complex requirements of today's billing  
23 environment.

1                                   (iv)    *Need for Replacement of Legacy CIS is Urgent (Swartz)*

2           Based upon the forecasted timeline for implementing a new CIS and the challenges that  
3 SDG&E experienced in 2016 with its legacy CIS, the time to begin the transition to a new CIS is  
4 now. As discussed in the direct testimony of Witness Snyder (Chapter 3), SDG&E’s proposed  
5 schedule begins immediately and projects that the new CIS would be implemented in the first  
6 quarter of 2021 and fully stabilized by the end of 2021.

7           Any delay to this proposed schedule will inevitably cause future issues related to the  
8 three areas mentioned above: data proliferation, mandated rate change implementation delays  
9 and delayed billing. Specifically, if the legacy CIS replacement is delayed beyond 2021,  
10 SDG&E projects that it will experience:

11           (1) Significant cost increases to address the operational challenges related to data  
12 proliferation issues, which are only getting worse each year as the legacy CIS and its 56  
13 subsystems are continually customized to meet changing regulatory, customer, and business  
14 needs. Data proliferation will continue to cause instability for the legacy CIS and increase the  
15 likelihood of extended outages and downtime, which could impact customers in a variety of  
16 ways, ranging from the inability to enroll in programs to viewing and managing their energy  
17 usage to receiving bills on time and making payments. While SDG&E cannot project the  
18 frequency or magnitude of future specific legacy CIS system or subsystem outages, there is no  
19 doubt that SDG&E’s ability to provide consistent and reliable customer service will be  
20 increasingly challenged as long as the existing legacy CIS and subsystem architecture remain in  
21 place;

22           (2) An exponential increase in the costs related to mandated rate change implementations  
23 along with considerable delays beyond what is currently occurring today. While it is impossible  
24 to predict the substantive new rates and services that might experience implementation delays in

1 2021 due to postponement of the CIS Replacement Project, it is a certainty that such  
2 implementation delays *will* occur. The outcome would be less customer choice and stymied  
3 public policies; and

4 (3) A drastic increase in the likelihood of future delayed billings for customers and the  
5 potential length of such delays. This inconsistency will frustrate customers' ability to predict  
6 their payment obligations and SDG&E's ability to collect on valid bills.

7 To avoid these issues from occurring beyond a 2021 implementation, SDG&E must  
8 begin the process of replacing its legacy CIS now.

### 9 **III. CONCLUSION**

10 This direct testimony provides a detailed overview of SDG&E's legacy CIS and the  
11 supporting subsystems, as well as the justification for why the transition to a new CIS is urgent  
12 and must begin now. This testimony provides the support for approving SDG&E's replacement  
13 of its legacy CIS without delay.

14 This concludes our joint direct testimony.  
15

1 **IV. STATEMENT OF QUALIFICATIONS**

2 **WITNESS QUALIFICATIONS FOR CHARLIE SNYDER**

3 My name is Charles (Charlie) Snyder. I am employed by San Diego Gas & Electric  
4 Company. My business address is 8330 Century Park Court, San Diego, California 92123.

5 I am currently a member of the Customer Information System replacement team. I began  
6 work at SDG&E in January 1996 as a member of the SORT system implementation team. I have  
7 held positions of increasing responsibility in the Customer Services organization including  
8 managing the Smart Meter Program where my primary responsibilities included overall program  
9 management, customer communications, vendor management, deployment, regulatory affairs  
10 and financial management. Most recently I was the manager for the Customer Services Program  
11 Management Office responsible for implementing key Customer Services system improvements  
12 and the introduction of new solutions. I have a Bachelors of Business Administration from  
13 National University in San Diego, CA.

14 I have previously testified before the California Public Utilities Commission.

15 **WITNESS QUALIFICATIONS FOR CHRISTOPHER SWARTZ**

16 My name is Christopher Swartz and my business address is 8330 Century Park Court,  
17 San Diego, California 92123. I am a currently a member of the Customer Information System  
18 replacement team at San Diego Gas and Electric. I began work at SDG&E in September 2001 as  
19 a Billing Analyst and have held positions of increasing responsibility in the Customer Service  
20 Operations and Information division including the manager of SDG&E's Billing Operations as  
21 well as the manager of SDG&E's Customer Operations Support department. Prior to my current  
22 position, I managed the Electric Rates team in the Customer Pricing Department for SDG&E  
23 where my primary responsibilities included the determination of electric rate design methods,  
24 and preparation of various regulatory filings.

1           In 1999, I graduated from the University of California at San Diego with a Bachelor of  
2 Science in Management Science. I also attended San Diego State University where I completed  
3 all coursework required for a Master's in Business Administration.

4           I have previously testified before the California Public Utilities Commission.

5



**ATTACHMENT A**

**ATTACHMENT A – LEGACY CIS PROJECTS THROUGH 2019**

**Legacy CIS Implementation Projects Forecasted to be Implemented January 2017 through  
 December 2019**

Description	Work Initiated	Projected Implementation	Notes
<b><i>Mandated Projects</i></b>			
Legacy Interval Data System Automation	Jan. 2016	Jan. 2017	Deployed
NEM Aggregation Automation	July 2016	TBD	Resolution E-4610
Rule 32 (Demand Response Direct Participation)	Aug. 2016	May 2017	D.16-06-008, OP 4
RROIR - High Usage Charge	Sept. 2016	June 2017	D.15-07-001. Pending petition for modification requests implementation delay.
Enhanced Community Renewables Program Implementation	Nov. 2016	June 2017	D.15-01-051
Energy Efficiency Baselines - AB 802	Nov. 2016	Jan. and Sept. 2017	D.16-08-019
Power Your Drive	July 2015	May 2017	D.16-01-045
Triennial Cost Allocation Proceeding (“TCAP”) – Minimum Bill	Nov. 2016	May 2017	D.16-10-004, OP4; Implementation date extended.
NEM - Output Check for Unmetered Storage	Jan. 2017	TBD	D.14-05-033, D.16-04-020
California Climate Credit	Jan. 2017	Oct. 2017	D.15-10-032
GRC Phase 2 - Release 1	Dec. 2016	Dec. 2017	A.15-04-012
GRC Phase 2 - Release 2	TBD	July 2018	A.15-04-012

GRC Phase 2 – Adaptive Streetlights	Jan. 2017	Aug. 2018	A.15-04-012
RROIR – Default TOU Pilot	Jan. 2017	March 2018	D.15-07-001
RROIR – Default TOU Mass	March 2018	Dec. 2019	D.15-07-001
<b><i>Projects tied to Pending Proposals</i></b>			
RROIR - Rate Comparison Mailer	TBD	Dec. 2017	D.15-07-001 and D.16-09-016
<b><i>Other Projects</i></b>			
Delayed Bill Plan – Release 2	Dec. 2016	TBD	Initial release completed in 2016
Low Carbon Fuel Standards	May 2016	Feb. and May 2017	Distribution of annual bill credits
Plug-In Electric Vehicle Sub-Metering Pilot Program	May 2016	Jan. and May 2017	D.13-11-002 and Resolution E-4651
Bill Refresh	Nov. 2016	Jan. 2018	SDG&E Advice Letter (AL) 2954-E-A/2514-G-A