DAVID J. MEYER
VICE PRESIDENT AND CHIEF COUNSEL FOR
REGULATORY & GOVERNMENTAL AFFAIRS
AVISTA CORPORATION
P.O. BOX 3727
1411 EAST MISSION AVENUE
SPOKANE, WASHINGTON 99220-3727
TELEPHONE: (509) 495-4316
FACSIMILE: (509) 495-8851
DAVID.MEYER@AVISTACORP.COM

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION OF AVISTA CORPORATION FOR THE AUTHORITY TO INCREASE ITS RATES AND CHARGES FOR ELECTRIC AND NATURAL GAS SERVICE TO ELECTRIC AND NATURAL GAS CUSTOMERS IN THE STATE OF IDAHO	CASE NO. AVU-E-15-05 CASE NO. AVU-G-15-01

DIRECT TESTIMONY
OF
JAMES M. KENSOK

FOR AVISTA CORPORATION

(ELECTRIC AND NATURAL GAS)

I. INTRODUCTION

Q. Please state your name, employer and business address.

A. My name is James M. Kensok. I am employed by Avista Corporation as the Vice-President and Chief Information and Security Officer (CISO). My business address is 1411 E. Mission Avenue, Spokane, Washington.

Q. Mr. Kensok, please provide information pertaining to your educational background and professional experience.

A. I am a graduate of Eastern Washington University with a Bachelor of Arts Degree in Business Administration, majoring in Management Information Systems, and a graduate of Washington State University with an Executive MBA. I have experience through direct application and management of Information Services over the course of my 32-year information technology career. I joined the Company in June of 1996. Over the past 18 plus years, I have spent approximately one year in Avista's Internal Audit Department as an Information Systems Auditor with involvement in performing internal information systems compliance and technology audits. I have been in the Information Services Department for approximately 17 years in a variety of management roles directing and leading

information technology and systems, planning, operations, system analysis, complex communication networks, cyber security, applications development, outsourcing agreements, contract negotiations, technical support, cost management, data management and strategic development. I was appointed Vice-President and CIO in January of 2007 and Chief Security Officer in January of 2013.

Q. What is the scope of your testimony?

A. My testimony will describe the costs associated with Avista's Information Service/Information Technology (IS/IT) programs and projects. These costs include the capital investments for a range of systems used by the Company, including the replacement of the Company's legacy Customer Information and Work and Asset Management System ("Project Compass"), Avistautilities.com WEB replacement, and several more important applications.

I also describe the additional IS/IT expenses required to support a range of new and updated applications and systems for cyber security, such as the operation of Project Compass, and the Asset Facilities Management application.

A table of contents for my testimony is as follows:

Q. Are you sponsoring an exhibit in this proceeding?

A. Yes. I am sponsoring Exhibit No. 10, Schedules 1 through 6. A report providing an overview of the Company project implemented to replace its legacy customer information system (named Project Compass), is provided in Schedule 1. Schedule 2 is an update report on the timing and cost of Avista's Project Compass. An overview of the communication plan related to the "Go Live" of Project Compass is provided as Schedule 3, and a timeline showing the individual communication activities is provided as Schedule 4. An example of the direct-mail communication is provided as Schedule 5. Schedule 6 is a high-level summary of the launch of Project Compass including customer service metrics showing performance of the new systems over the first five weeks of operation.

II. IS/IT OPERATING EXPENSES

Q. What are the primary business needs supported by Avista's Information Services Department?

A. With advancements in the utility industry, the use of operating, information, and customer-application technologies is increasingly prevalent in day-to-day business operations. The Information Services department provides the technology support required by all Company operations, both internal as well as customer-facing. Examples include field operations, engineering, transmission & distribution operations, power supply, finance, treasury, legal, human resources, customer solutions, customer services, and regulatory functions. Types of support include the design, engineering, implementation, and support of cyber security, computer hardware, application software, data and voice systems and networks, application integration, business continuity and disaster recovery, and data management and mobility. Our customers are provided with mobile solutions for transacting business with Avista that are available 24 hours per day, in addition to having more data and information about their energy use and tools to manage their consumption of energy. Records management is increasing for both electric and natural gas

infrastructure, and Avista is experiencing continued growth in the use of its networks by customers and our employees who are increasingly using mobile, real-time systems to transact business and deliver safe and reliable energy services. These technologies are foundational to Avista's efforts to keep pace with the service expectations of our customers, to fulfill our regulatory requirements, and to achieve cost savings through prudent technology deployments.

Q. What are the primary drivers of increasing IS/IT expenses for 2016 and beyond?

A. There are four key areas, the first of which is the expense associated with the replacement of obsolete systems, such as the Company's legacy Customer Information and Work Management systems, which will be explained in detail later in my testimony.

The second area is the increasing cyber and physical security requirements to protect Company infrastructure. Our industry is increasingly a target from malicious entities, and in order to protect Avista and its customers, we have been required to increase staffing, deploy new security systems, advance employee training, and deploy more sophisticated business-continuity recovery programs. Meeting expanding regulatory requirements, such

as those supporting electric transmission reliability, is also driving cost increases in security compliance.

A third focus is the sensor technology and the associated data networks required by the industry's modernization of the electric grid and the improved reliability of our natural gas distribution system. Though there are many advantages for customers and the Company associated with the deployment of these new systems, the expenses to support them are an increasing portion of the costs of providing efficient, safe, reliable, and cost-effective energy services.

The fourth driver of Avista's costs is related to the growth in usage of applications, data, and our data networks. As customer expectations and business and compliance requirements continue to grow, they drive the need for new and expanded technology solutions. Although these new solutions provide the most cost-effective way to meet these growing needs, they also increase costs for application licensing, maintenance and support, and for the computer hardware and networks required to enable them.

Q. As Information Services requirements have increased, has Avista focused on managing its overall technology expenses for the benefit of its customers?

A. Yes. Over the past several years, Avista has focused on reducing customer transaction costs through the prudent deployment of technology. Along with meeting customer needs, Avista works continuously to minimize its costs and to maximize employee efficiency through the use of appropriate technology and staffing.

As an example, labor cost reductions were achieved through realignment of legacy custom application labor skills with contemporary commercial application skills. This resulted in a $924,000 reduction in contract labor for applications operations and delivery, which was partially offset by an increase of $711,000 as a result of the conversion of nine contract positions to Avista employee positions, for a net reduction in labor costs of $213,000. See “Applications Systems – Net Labor Reduction” section below for additional information on these labor reductions.

Q. Please summarize the increases in expenses for the 2016 rate year.

A. Table No. 1 below summarizes the net increase in IS/IT expenses for 2016.[1] A brief description of each item is provided following Table No. 1.

TABLE NO. 1
Information Services Incremental Expense Increases (2016 vs. Test Period)

	System Expense
New Expense From Projects	
Asset Facilities Management Application Migration Replacement	$ 68,437
Project Compass	$ 663,188
Embotics - Data Center Server Management Software Tool	$ 16,940
Enterprise Document Management	$ 42,000
Financial Forecast Model	$ 21,000
iFactor - Outage Reporting and Viewing, and Mobile Capabilities	$ 304,360
Mobility in the Field - Gas Compliance	$ 60,000
Visibility - Gas Compliance	$ 36,120
NetInsight Refresh	$ 93,000
Next Generation Radio System (Dispatch Radio System)	$ 139,062
Radio Telephone Communications Console System Refresh	$ 8,658
Security Systems - Non Labor Additions	$ 80,000
Data Analytics Software Application	$ 60,000
Total New Expense From Projects	**$ 1,592,765**
Other Expenses: (incremental expense)	
Applications Systems - Net Labor Additions	$ (213,092)
Adobe Creative Cloud Suite Software-as-a-Service	$ 52,176
ESRI Geographic Information System	$ 188,796
Microsoft System Maintenance	$ 301,449
Network Systems - Non-Labor Additions	$ 317,905
Network Systems - Net Labor Additions	$ 186,472
Oracle System (Financial Application & Data) Maintenance	$ 113,043
Security Systems - Net Labor Additions	$ 125,383
Total Other Expenses: (incremental expense)	**$ 1,072,132**
TOTAL (New Expense from Project and Other Expenses)	**$ 2,664,896**

Asset Facilities Management Application Replacement (Project Atlas) Support Costs – $68,437

Project Atlas will replace the Company's obsolete Facilities Management system, and will consist of three applications with new commercial-off-the-shelf applications. The project includes replacement of the electric and natural gas Construction Design application,

[1] Although the Company anticipates increased expenses in 2017 above those in 2016, Company witness Ms. Andrews has not included these expenses in her 2017 pro forma adjustments. See 2017 IS/IT capital additions discussion later in my testimony.

Edit Tool Application, and the Company's proprietary Outage Management Application. There will be new incremental on-going technology support costs associated with the new applications. These applications aid in the engineering and design of Avista's electric and natural gas infrastructure, which costs would increase without the aid of this technology. In addition to supporting design, the Outage Management Application allows the Company to quickly isolate the likely cause of system outages, to communicate proactively with customers, and to quickly and accurately dispatch Avista crews for service restoration.

Project Compass Support Costs - $663,188

There will be a net increase of $663,188 over current operating expenses associated with the deployment of the Company's new Customer Service and Work and Asset Management Systems implemented as part of Project Compass. The total for new operating expenses required to support these new Systems is $3,020,858, however, there is a corresponding offset in the amount of $2,357,670, which reflects the annual expense reduction in contract services and mainframe computer costs associated with the retirement of the Company's Legacy Customer Service and Work Management Systems. The new costs are for the annual license and maintenance fees associated with the new replacement applications (IBM Maximo and Oracle Customer Care & Billing) and ancillary supporting applications. Costs also include the professional services associated with the real-time operation and maintenance of the applications, and the labor expense supporting management reporting for the new systems. A brief description of each of these costs is provided below:

Oracle Customer Care & Billing (CC&B) and IBM Maximo Applications

- Application Maintenance Fee paid to IBM. This fee supports ongoing application maintenance, enhancements and updates.
- Application Maintenance Fee paid to Oracle for system maintenance, enhancements and updates.
- Application Maintenance Fee for IBM's Tivoli batch scheduling software, which automates, aggregates and executes batch system functions each day (e.g. customer billing, credit and collections, letters and notices).
- License and Maintenance Fee for the Oracle Database System.

- License and Maintenance Fee for the Oracle Data Integrator (ODI) Application, which performs the extraction, transfer and loading of data for management reporting.
- License and Maintenance Fee for the WebLogic Application, the middleware application layer that is the underlying Java application engine that CC&B and Oracle Utility Analytics (OAU) require to operate.

Shared Support

- License and Maintenance Fee for HP's "Quality Center" Application, which is used to automate the routine user testing of the integrated software systems.
- Outside services (labor) supporting management reporting for the Maximo and Customer Care & Billing Applications.
- IBM Application Management Services, providing technical resource support for maintaining and managing the real-time availability and performance of the Customer Care & Billing and Maximo application systems for Avista.
- License and Maintenance Fee for the GoldenGate Application, a component of the Oracle Utility Analytics (OUA) reporting solution for both Oracle CC&B and IBM Maximo.

Embotics – Data Center Server Management Software Tool Support Costs - $16,940

The current corporate virtual environment is underutilized. Many servers are allocating memory they are not using causing us to buy more resources to meet the memory requirements. The Embotics software tool can help us right-size the memory, thus allowing us to reduce our current resources and avoid purchasing future resources, making our virtual environment more efficient. This is the software support cost of the Embotics software tool.

Enterprise Document Management Support Costs – $42,000

This cost is for software maintenance for a new application used in managing invoice processing and archiving. Currently, documents (i.e., invoices) in various departments are maintained on paper, and are processed manually. The new application allows Avista to scan invoices for electronic storage, processing, and

approval, providing for more efficient and timely processing and access to stored documents.

Enterprise Voice Portal Application Upgrade Support Costs – $242,417

Avista's current automated telephone system is no longer supported. The system manages all customer calls for reporting outages, automated bill pay and billing inquiries, and other types of customer self-service options for our customers. These expenses support the services agreement, providing for software maintenance and management for the replacement voice portal system.

Financial Forecast Model Support Costs – $21,000

Avista has chosen to replace the Impact software, which is no longer supported, with the UIPlanner financial model. UIPlanner will provide all existing capabilities as well as efficiency gains and enhancements. The software will help the financial forecasting group accurately and efficiently forecast the financial position of the company, including complex "what-if" scenarios which aid senior management and others in their decision-making. This cost supports the application maintenance for the replacement software.

iFactor – (Outage Reporting and Viewing, and Mobile Capabilities) Application Support Costs – $147,325

For certain customer-facing web and mobile technologies Avista has decided to not customize as part of its customer web portal refresh of Avistautilities.com (Project Phoenix), but rather integrate to a commercial software platform from iFactor Consulting using two of their modules. The first, called iFactor Storm Center, is a web and mobile GIS map-based outage communications software for utilities. Storm Center communicates power outage information to the public using a map interface for web and for mobile natively on iPhone and Android smart phone devices. The second, called Notifi, is a proactive and interactive customer communications platform designed specifically for utilities, with standard interfaces to utility back-end systems (i.e., Customer Care and Billing CC&B). With automated outbound event processing and preference management for customers, Notifi pushes information to Avista customers, over the channel they want to receive it, including mobile text, email, social media and voice natively on iPhone and Android smart phone devices.

Mobility in the Field Gas Compliance Support Costs – $60,000

The Mobility in the Field program is designed to increase the Company's use of field mobile dispatch for service employees equipped with mobile devices. This cost supports the software maintenance agreements that will need to be in place in order to maintain the new system.

Visibility Gas Compliance Project On-Going Support Costs – $36,120

The Visibility Project was completed as part of the Mobility in the Field program to reduce paper processes in the field through implementing mobile technology. This expense is for data cost and maintenance of hardware and software used for new mobile technology deployed to over 20 Leak Surveyors in the field. This new technology improves processes through reducing a previous paper process and enabling the data collection to occur electronically. A data plan is activated for each tablet computer to operate the software application in order to collect the data in the field electronically.

NetInsight Refresh Support Costs – $93,000

Web analytics is the measurement, collection, analysis and reporting of web data for purposes of understanding and optimizing web usage and customer transactions. Web analytics is not just a tool for measuring web traffic but can be used as a tool for business and customer research, and to assess and improve the effectiveness of a website. Avista is refreshing its current web analytics system as it has come to end of life by its vendor (IBM). Web analytics will be applied to Avista's upgraded customer web portal and its upgraded Intranet portal, which is used by Avista employees.

Next Generation Radio System (Dispatch Radio System) Hardware and Software Maintenance – $139,062

These costs support the maintenance contract for the hardware and software infrastructure required to effectively own and operate Avista's Land Mobile Radio System (LMR) (Next Generation Radio system). Avista maintains a private LMR system because no public communications provider is capable of covering all of our service territory including the rural and remote areas. Our LMR system is also designed to operate independent of public providers and to be resilient in the event of

disasters that affect other means of communication. The LMR system ensures efficient and effective communications.

Radio Telephone Communications Console System Refresh Support Costs – $61,048

Deployment of this refreshed console equipment is a prerequisite for the successful implementation of the Next Generation Radio project, described above in my testimony. The integrated console system provides access to the narrowband communication network being deployed in the Next Generation Radio project. These costs are for maintenance fees required to assure the system meets our availability and security requirements for service. In particular, the maintenance fees also provide the Company access to technical support, problem resolution, software patches that address security vulnerabilities, and enable features and enhancements that extend the functionality of the deployed console system, and provide replacement hardware for equipment that fails.

Security Systems – Non Labor Additions – $80,000

This incremental expense is for software maintenance, third party vulnerability and penetration testing and for new application services that monitor high-risk utility targets (including both physical and cyber), software to maintain compliance with changing regulations, and phishing email awareness testing.

Data Analytics Software Application Support Costs – $60,000

This expense is for maintenance and support fees for predictive analytics software related to the Trove Sunstone Platform and Energy Pre-schedule Load Forecasting Application. There are third party data access fees included in the Sunstone Platform as it uses weather data and other third party data as part of its predictive analytics and data science technology. The Pre-Schedule Forecast application provides a precision forecast for the next day energy consumption needs to help make daily resource balance decisions. The application compares its forecasts against actual performance for continuous forecast improvement. The Monthly Forecast predicts monthly consumption up to 36 months in advance. It is used to determine how much energy to buy in advance.

Applications Systems – Net Labor Reduction – ($213,092)
We continue to employ a hybrid (in-source/outsource) labor sourcing model that maximizes business value and delivers consistent customer satisfaction. As such we are transitioning these positions to more closely align with the technology being managed. Nine key application systems contract positions were converted to Avista employee positions in 2015: 1) Operational Technology Lead, 2) Customer Technology Lead, 3) Back Office Technology Lead, 4) Systems Analysts (x4), 5) Product Owner, and 6) Program Manager. In addition, a Product Owner will be added for oversight of application demand in Avista's new Customer Information System (CIS) and Asset Management platforms (Oracle Customer Care and Billing and IBM Maximo).

ESRI Geographic Information System Software Maintenance – $179,183
ESRI is the core product suite for Avista's geospatial system. In 2015 we are planning on a refresh of this platform. Throughout the system refresh process and beyond we will need access to ESRI development staff, via a more robust support agreement. This improved support agreement grants us access to level 2 and level 3 ESRI developers to assist us with incident and problem resolution across the ESRI suite of tools. Further, Avista plans to increase access to its own geospatial information system (GIS) data, through the use of ESRI's client / server software model. This model requires additional licensing for server software but allows easier access to GIS data through browser based custom and commercial applications. An example of value this increased access will bring to our customers is public publishing of waterway access, closures and repairs.

Adobe Creative Cloud Suite Software-as-a-Service - $52,176
Creative Cloud by Adobe is a subscription based suite of graphic design tools and is the only upgrade path for Avista's current Adobe Creative Suite perpetual licenses. Avista's creation and use of digital multi-media for print, advertising, web, signage for both internal and external communications relies on sharing files with outside agencies and for internal Avista print and graphic design personnel to all be on the same platform. Most of these agencies have refreshed to Creative Cloud forcing Avista to follow suit and move to Adobe's required software as a service model (SaaS).

Microsoft System Maintenance – $301,449
The incremental increase in maintenance fees reflects vendor price increases for existing systems, as well as costs associated with the deployment of new systems. One such new system is "desktop virtualization," which provides a highly flexible and much-more secure desktop computer environment. In addition, this approach supports a more complete desktop disaster recovery strategy, as all components are essentially saved in the data center and backed up through traditional redundant maintenance systems. In addition, because no data is saved to the user's device there is much less chance that any critical data can be retrieved and compromised in the event a device is lost.

Network Systems – Non-Labor Additions Support Costs – $317,905
This cost is for service and maintenance fees paid to network providers such as AT&T and Verizon for increased network capacity and system support. As network capacity is increased the electronics that move data/voice traffic over the networks must be upgraded. The upgraded electronics require maintenance and service contracts to keep them current on security patches, firmware upgrades and general performance tuning and support.

The increased utilization of Company networks has resulted, in part, from the increased data associated with customer access to billing and energy use data and new technology supporting Avista's electric grid modernization, notably feeder automation, smart transformers, and faulted circuit indicator projects.

Network Systems – Net Labor Additions - $186,472
The Communications Technician Apprenticeship role is designed to allow individuals to move into a new field and gain the training required to be proficient in a craft. We currently have three existing technicians that are within four years of full eligibility for retirement. It has been our practice to hire an apprentice and invest in their training so they will be fully competent in the role by the time the Sr. Tech retires.

Oracle System (Financial Application & Data) Maintenance – $113,043
Avista uses Oracle products to provide, maintain and manage its primary business databases, supporting financial, supply chain, operations, customer service, and real-time infrastructure data. This cost covers increases in recurring maintenance fees as well as incremental costs associated with new Oracle databases that are being licensed. In 2015 we will be introducing a new Oracle tool that will allow us to keep our Java environment updated to the most current supported version minimizing customer complaints related to system availability.

Security Systems – Net Labor Additions – $125,383
Due to increasing physical security threats, Avista has made a strategic decision to convert an existing physical security contract position to a fulltime employee. This long-term position has responsibility for physical security at all Avista properties.

Smart Circuits Distribution Automation Support Costs – $287,756
This incremental cost is for non-labor software and hardware maintenance fees associated with Avista's modernization of its electric grid. These fees were paid previously from funds associated with the Company's SmartGrid Investment Grant awarded under the American Recovery and Reinvestment act of 2009. This cost-sharing grant expired in January 2015, at which time the necessary hardware and software maintenance fees reverted to an ongoing Company expense.

III. IS/IT CAPITAL PROJECTS

Q. Please describe each of the IS/IT capital projects planned for 2015 - 2017.

A. The IS/IT capital costs for projects to be completed during the period from January 1, 2015 through December 31, 2017 total $220.8 million on a system basis. These investments are identified by project in

Table No. 2, below, and each project is briefly described in the following testimony.

TABLE NO. 2
IS/IT Capital Projects (System)

Business Case Name	2015 $ (000's)	2016 $ (000's)	2017 $ (000's)
AvistaUtilities.com Upgrade	$ 5,145	$ 2,000	$ -
Enterprise Business Continuity Plan	1,043	450	450
Mobility in the Field	420	320	-
Technology Refresh to Sustain Business Process	21,379	16,095	16,095
Customer Information and Work & Asset Management System	96,685	-	-
Enterprise Security	5,400	3,200	3,200
Technology Expansion to Enable Business Process	7,431	5,552	5,799
AFM COTS Migration	-	-	15,608
High Voltage Protection Upgrade	1,252	415	-
Next Generation Radio Refresh	4,007	-	-
Microwave Refresh	2,755	3,050	3,050
	$145,517	**$31,082**	**$44,202**

AvistaUtilities.com Upgrade – 2015: $5,145,000; 2016: $2,000,000; 2017: $0

Like many businesses today, the Company is experiencing continued growth in the use of its customer website, Avistautilities.com. The website was originally built in 2006-2007, but because the technology landscape has advanced so quickly, the site does not meet current web best practices for customer usability and security. This project will update and improve the technology, overall web usability, security and customer satisfaction. The website is part of the Company's strategy to provide customers a more effective channel to meet their expectations for self-service options, including mobile, energy efficiency education, and to drive self-service as a means to lower transaction costs. The Company is also upgrading its AvaNet System (Avista Intranet), however, those costs are included in the IS/IT Technology Refresh to Sustain Business Process project, described below.

Enterprise Business Continuity Plan - 2015: $1,043,000; 2016: $450,000; 2017: $450,000

Avista has developed and maintains an Enterprise Business Continuity Plan (Plan) to support the Company's emergency response, and to ensure the continuity of its critical business systems under crisis conditions. The framework includes the key areas of technology recovery, alternate facilities, and overall business processes. The effort of developing and continuously improving the Plan ensures the readiness of systems, procedures, processes, and people required to support our customers and our communities any time we are required to operate under critical emergency conditions.

Mobility in the Field – 2015: $420,000; 2016: $320,000; 2017: $0

This program is designed to increase the Company's use of field mobile dispatch for service employees equipped with mobile devices. Avista has documented 30 field opportunities to apply mobile technology, and has selected those with the greatest benefit and savings for implementation in a five-year program, named "Visibility in the Field." This effort primarily supports the functions of Leak Survey and Gas Service Dispatch by enabling the use of facility maps on a mobile device.

Technology Refresh to Sustain Business Process – 2015: $21,379,000; 2016: $16,095,000; 2017: $16,095,000

The Company manages an ongoing program to systematically-replace aging and obsolete technology under "refresh cycles" that are timed to optimize hardware/software system changes or industry trends. An example of technology managed under this program is the fleet of personal computers and other computing devices used by field operations, power plant operators, call centers, and our general office employees.

The technology refresh business case is organized by technology type. The major categories are Applications, Network Systems, Communication Systems, Central (Compute/Storage) Systems, Distributed Systems and Environmental (Power, HVAC, Fire, etc.) Systems. Each category of technology has a steering committee for governance. The steering committees are members of Avista leadership team. Steering committee members not only provide oversight on program scope, schedule and budget, they also monitor project priority for business value and

the risk associated with product obsolescence. Funding approval by the Capital Planning Group is routinely set below the business case requested level.

The business case program generally has over one hundred active projects each year. The scope spans technology solutions for back office, customer facing, energy operating and control systems. A sample of the 2015 project scope is as follows: Enterprise Voice Portal (IVR), Office Communicator & Voicemail, Communication Management System, Metropolitan Area Network Transport, Avista Intranet, Financial Forecast Model, Claims System, Java 1.7x, Nucleus, Oracle Database 12c, Internet Explorer 11, Citrix Platform, HP CAE/Radia, MS Office 2013, Rugged Computers, and TWACS telemetry. Each project has formal project management and adheres to our Project Management Office (PMO) process.

Customer Information and Work and Asset Management System – 2015: $96,685,000

The Company's legacy Customer Information and Work and Asset Management System had been in service for twenty years and has been replaced in a multi-year effort named "Project Compass." The major applications replaced include the Company's Customer Service System, Work Management System, and the Electric and Gas Meter Application. The primary replacement systems are Oracle's Customer Care & Billing application and IBM's Maximo work and asset management application. A portion of the Maximo system was enabled in the fall of 2013, and the full System entered service in February 2015. I describe the detail of this significant technology project later in my testimony.

Enterprise Security – 2015: $5,400,000; 2016: $3,200,000; 2017: $3,200,000

There are three primary drivers of the increasing costs for Enterprise Security: cyber security, physical security and regulatory standards. Each plays a critical role in supporting our delivery of safe and reliable energy to our customers.

Cyber Security

The security of our electric and natural gas infrastructure is a significant priority at a national and state level, and is of critical importance to Avista. Threats from cyber space,

including viruses, phishing, and spyware, continue to test our industry's capabilities. And while these malicious intentions are often unknown, it is clear the methods are becoming more advanced and the attacks more persistent. In addition to these threats, the vulnerabilities of hardware and software systems continue to increase, especially with industrial control systems such as those supporting the delivery of energy. For these reasons, Avista continues to advance its cyber security program by investing in security controls to prevent, detect, and respond to these increasingly frequent and sophisticated attacks. Examples of projects that fall under this category include a secure electronic file transfer system for inbound and outbound files; network access control to monitor, detect, and enforce rules for wired and wireless devices connecting to the network; and a website filtering solution to reduce intentional and unintentional malware found on internet sites.

Physical Security

While considerable attention is focused on cyber security, physical security also remains a concern for our industry. Physical security encompasses the aspects of employee safety and the protective security of our facilities and critical infrastructure. Acts of theft, vandalism, and sabotage of critical infrastructure not only result in property losses, but can also directly impact our ability to serve customers. Securing remote unmanned or unmonitored critical infrastructure is difficult, especially when traditional tools such as perimeter fencing by itself are not adequate. In response to these challenges, the Company has focused its resources on additional physical security protection (i.e., lighting and crash barriers), remote detection and response technology, which is creating the need for additional physical security items, expertise and technology.

Regulatory Obligations

Advancing cyber threats continue to drive change in the regulatory landscape faced by the Company. Early in 2013, President Obama issued the Executive Order "Improving Critical Infrastructure Cyber security." The Order directed the National Institute of

Standards and Technology to work with stakeholders in developing a voluntary framework for reducing cyber risks to critical infrastructure. The framework consists of standards, guidelines, and best practices to promote the protection of critical infrastructure. The Federal Energy Regulatory Commission also issued Order 791 on November 22, 2013, approving the North American Electric Reliability Corporation Critical Infrastructure Protection Standards, Version 5. Therefore, we continue to invest in capital assets to comply with these requirements and continue to improve the security of our infrastructure. Additionally, these activities will increase our security-related operating costs (as discussed earlier in my testimony) because they require the Company's security controls and processes to conform to new standards, guidelines, and best practices. Examples of projects that fall under this category include improvements to physical security at the Noxon Rapids facility and the refresh of our Security Incident and Event Management System, which is an analytic system that alerts and reports on security incidents and anomalous activity.

Technology Expansion to Enable Business Process – 2015: $7,431,000; 2016: $5,552,000; 2017: $5,799,000

This program facilitates technology growth throughout the Company, including technology expansion for the entire workforce, business process automation and increased technology to support efficient business processes. For example; when trucks are added to the fleet, communication equipment needs to be added to the truck; as the Company hosts more customer data, disk storage needs to be expanded, as customers expand their use of the website, additional computing capacity is needed.

AFM COTS Migration – 2015: $0; 2016: $0; 2017: $15,608,000

The project replaces the Company's obsolete, custom Facilities Management system (Project Atlas) with a commercial, off-the-shelf application. The project includes replacement of the natural gas and electric Construction Design Tool, Edit Tool, and the Company's proprietary Outage Management Tool. These applications aid in the engineering and design of Avista's electric and gas infrastructure, which costs would increase without the aid of this technology. In addition to supporting design, the Outage Management allows the Company to quickly

isolate the likely cause of system outages, to communicate proactively with customers, and to quickly and accurately dispatch Avista crews for service restoration. Also included in the project scope are field mobility applications including a version upgrade to the Ventyx/ABB mobile workforce management system and the addition of mobile tools. These applications will work with the Construction Design, Edit and Outage Management applications to deliver work electronically to field personnel and return completion results electronically to the initiating systems improving the timeliness and accuracy of the work results.

High Voltage Protection Upgrade – 2015: $1,252,000; 2016: $415,000; 2017: $0

Telecommunication facilities, including Phone, Communication Switches, SCADA, and Metering & Monitoring systems, are commonly co-located inside the Company's high voltage substations. This requires communications technicians to work in close association with our high-voltage electrical equipment. The Company has implemented new high-voltage protection & isolation standards designed to lower potential risks to our personnel and equipment. This project will implement the clearance changes required to meet the new standards.

Next Generation Radio Refresh – 2015: $4,007,000; 2016: $0; 2017: $0

This project refreshes Avista's 20-year-old Land Mobile Radio system. The Company maintains this private system because no public provider is capable of supporting communications throughout our rural service territory. And, since our systems comprise a portion of our nation's critical infrastructure, Avista is required to have a communication system that will operate in the event of a disaster. This project fulfills a mandate from the Federal Communications Commission that all licensees in the Industrial/Business Radio Pool migrate to spectrum efficient narrowband technology.

Microwave Refresh – 2015: $2,755,000; 2016: $3,050,000; 2017: $3,050,000

The company manages an ongoing program to systematically-replace aging and obsolete technology under "refresh cycles" that are timed to optimize hardware/software system changes. This project will replace aging microwave communications technology with current technology to

provide for high speed data communications. These communication systems support relay and protection schemes of the electrical transmission system. Reducing Avista's risk of failure of these critical communication systems will have a significant beneficial impact on Avista's transmission capacity and ability to serve our customers electrical needs.

IV. CUSTOMER INFORMATION AND WORK AND ASSET MANAGEMENT SYSTEM REPLACEMENT – PROJECT COMPASS

Q. Please summarize the replacement project for Avista's Customer Information and Work and Asset Management systems.

A. In 2010, Avista began the research and planning for replacing its legacy Customer Information and Work Management System. Named "Project Compass," the Project replaced the Company's legacy applications with Oracle's 'Customer Care & Billing' solution, and IBM's 'Maximo' work and asset management application. An overview of Project Compass, containing a detailed project narrative of the early stages of implementation, as well as supporting documentation, is attached as Exhibit No. 10, Schedule 1.

Q. Can you provide a synopsis of the importance of these systems and the magnitude of the replacement effort undertaken by the Company?

A. Yes. While it’s common for a business to install one major enterprise software system at a time, such as a customer service, financial management, supply chain, or asset management system, through Project Compass Avista installed two major systems simultaneously. This was necessary because our legacy system contained a customer service module and a work management module that were highly integrated and both were in need of replacement. The effort required not only that these two systems be installed and integrated, but that together, they be integrated with approximately 100 other applications and systems required to perform the Company’s integrated business operations. Some of these systems include the Avista customer website, the Company’s various internal systems (such as financial applications, varied databases, supply chain, crew dispatch, outage management reporting), systems of outside financial institutions used by the Company and our customers, and the many vendors who support our delivery of electric and natural gas service, such as bill printing and presentment.

Customer information and work and asset management systems are central to enabling an organization’s daily operations. For Avista, they support functions ranging from customer calls, to automated service on the phone

system or web, storage and access of electric and natural gas asset information, customer billing, outage management, customer work scheduling, ordering construction materials, and managing customer account information. Together, these two systems enable over 200 individual work processes requiring over 3,500 individual process steps. They support the work of over 700 individual employees, and the new work processes and tools required a significant training effort. Avista's training staff delivered over 40 different instructor-led courses (each delivered several times to different groups of end users), in training sessions that ranged from two hours to 175 hours per course. Avista employees received over 30,000 hours of training for the new systems under this program. At the close of April 2015, Avista employees had worked just over 299,500 hours on Project Compass; this is in addition to the staff effort of the 37 contract companies that supported the Project.

Q. Have these new systems been placed into service?

A. Yes. The first day of service for the new systems (the "Go Live") was February 2, 2015, and, as explained later, the deployment of these new systems was very successful.

Q. Please describe the Company's legacy Customer Information System?

A. Avista's legacy Customer Information System (System) served the Company and our customers well from 1994 to 2015. That longevity was unusual in the industry, and was achieved by linking the system over time with commercial and Avista-developed applications that added functionality to the original architecture. This technology strategy was the foundation of Avista's customer service program for many years. While extending the life of the System delivered value for customers, our ability to continue to add new functionality was constrained, and there was mounting business and service risk associated with the many older technologies on which the system depended. Technical assessments of the System highlighted these risks and identified the need for its replacement.

Q. Please describe the systems that were replaced as part of Project Compass.

A. Avista's legacy Customer Information System was composed of three highly-connected applications, which included:

- Customer Service System – this application supported the traditional utility business functions of meter reading, customer billing, payment processing,

credit, collections, field requests and customer service orders;

- Work Management System – this application was used to create orders for service and emergency calls and for construction jobs for customers and Company operations; and
- Electric & Gas Meter Application – this application hosted the data for the Company's in-service electric and gas meters.

Together, these three applications, also referred to as the Avista "Workplace", were connected over time with many other applications and systems required to conduct all aspects of our customer service and gas and electric business operations.

Q. What were the factors driving the need for replacement of Avista's Customer Information System?

A. The rapid evolution of information science technologies impacts the life cycle availability of older software and hardware products and services, and eroded the underlying capabilities of our legacy technology. At the same time, each new generation of technology gives software systems more flexibility and functionality than our legacy system could have easily provided. This dual impact added cost, complexity and risk to the ongoing operation of our legacy technology, and helped drive the ever-increasing service expectations of customers for all businesses they use, including their utility.

The Company's legacy system was supported by a network of older technologies, many of which were expensive to operate and/or were no longer sold, maintained or supported. As a result, Avista and its primary support contractor (Hewlett-Packard) employed many technical 'workarounds' required to continue using the legacy System. Key limitations associated with those technologies are briefly described below:

Platform – The Company's Customer Information System was dependent on a mainframe-computing platform because it used databases and program applications developed for that environment. While a mainframe was the only platform with enough power to support the System when it was designed, it is more expensive to operate today than mid-range computers having ample capability. Because mainframe platforms had become far less common, the available expertise required to manage, maintain and update these systems had become more limited. In addition to the realtime execution of programs on the mainframe, required by the Workplace applications, the programs and data stored there had to be updated every night in what was known as a 'batch' program. The batch updated base data and performed other functions such as producing customer bills.

Computer Languages – Avista's Workplace applications were written in COBOLv2, a version of the programming language that had not been used in applications, or sold or supported for many years.

Another computer language key to Avista's legacy system was known as Smalltalk. This language was used to generate the display information on network computers used by our customer service representatives. And like COBOLv2, Smalltalk was also no longer commercially sold or supported.

Supporting Applications –Avista's legacy applications were generated using a case tool known as ADW (Application Development Workbench), and the applications were difficult to change without using the ADW tool. Avista's version of ADW was no longer manufactured or supported, and, in addition, it could only run on an OS/2 operating system that likewise had not been sold or supported for many years.

Technical Resources – Maintaining the Company's legacy system required training and support of technical staff competent in these older programming languages, applications, and computer operating systems. The Avista-Hewlett-Packard support staff, many of whom grew up with those legacy technologies when they were mainstream, had

either retired, or were anticipated to do so in the next few years. Replacing knowledgeable staff had become extremely difficult because there was no longer technical training or schooling available for these old languages, applications and systems. Younger technicians had to be trained in-house, and in addition, it was difficult to channel these employees into career tracks that had very-limited and diminishing future application.

Q. Were there risks associated with the continued operation of the Company's legacy system?

A. Yes, as described above, many of the obsolete elements of the Customer Information System were supported by very-specialized applications, which themselves were obsolete and no longer supported, or by complex technology workarounds. Each of these introduced a level of risk that was greater than that associated with contemporary hardware, operating systems, technical support, and business applications. And because these risks increased as the technology continued to age, the cumulative risk to the Company grew as the longevity of the System was extended.

Q. Were these risks unique to Avista's legacy system?

A. No, this discussion illustrates the general technology principle shared by many legacy systems like the Company's. Even though they may continue to perform their intended functions, they are subject to greater and greater risk over time, and consequently, are considered to be problematic.

Q. Beyond increasing business risks, were there other considerations for replacing the system?

A. Yes, there were several which I describe below:

System Modifications – The legacy architecture of the Company's System made it cumbersome and expensive to modify or to add new functionality. That arose because the linkages between the applications of Avista's Workplace, along with the software applications that connected Workplace with the many other applications and systems required to support the Company's operations, were 'hardwired' together. The result was that a programming change made to one application often required complementary changes in both the connecting software and the other applications themselves. Because the system had been stretched over time so far beyond its original design considerations, these layers of changes had geometrically increased the complexity of the entire system. Finally, because the legacy System was used only by Avista, these

application development costs had to be borne entirely by our customers.

System Replacement Costs – Continuing to add complexity to the legacy System could have made its eventual replacement more expensive. This was because the functionality that was programmed into the legacy System also had to be programmed or 'configured' in the new replacement applications when they were installed. Generally, as the complexity of the legacy System increased, then the cost, complexity and technical competence required to install the replacement system increased as well.

Constrained Capability – In addition to the risks and costs of extending its service life, the ultimate flexibility of the platform had been largely exhausted. Designed as a meter-based billing system, the Company had cost-effectively expanded its capability by seamlessly integrating technologies barely imagined when the system was designed; home computers were uncommon, the internet was in its infancy, there were no e-mail services, few cell phones, no text or SMS messaging, and no mobile computing, as supported by contemporary smart phones and tablets. However, while the System had been able to accommodate many significant developments over time, it

still lacked the fundamental capabilities required today to support the new service options viewed by customers as 'basic service', or the many utility product offerings becoming more common in our region and around the Country.

Q. Did the Company consider other options to reinforce its legacy System, short of replacement?

A. Yes. Periodically, Avista and its support partner, EDS/Hewlett-Packard, evaluated the System's capabilities as well as options for its possible modernization. In 2002, as some of the technologies supporting Avista's System, such as ADW, were becoming unsupported, an assessment was made of the feasibility of moving the Company's system from the mainframe platform to a contemporary mid-range platform and operating system. The benefits of such a process, commonly known as 'replatforming', were forecast over time and were compared with the estimated costs for completing the work. Results of this work indicated that replatforming the System at that time was not cost-effective, and as a result, this work did not proceed.

The next assessment was made in 2003 and focused on ways to reduce the risk associated with the ADW application, at the time running on aging desktop computers using the OS/2 operating system. The project

report recommended Avista purchase specialized software to emulate the OS/2 system on contemporary computers and operating systems. This recommendation was implemented.

The legacy System was reviewed again in 2006 as part of a larger information technology review conducted for the entire Company. The report noted the Company's Customer Information System as a 'high risk' application that was a candidate for either replacement or "refactoring." The latter refers to a process of changing the internal structure of the existing application code to reduce its complexity and improve its readability. While this process helps reduce the risk associated with legacy software, it does not markedly change its basic properties or performance. Refactoring of the Customer Service System was not evaluated further at that time.

Most recently, in 2010, the Company again considered reinvesting in its legacy System as a means to delay its ultimate replacement. As a prelude to requesting vendor proposals to support such an effort, the Company sent a Request for Information to several major information technology vendors to describe the legacy System, and to gauge their interest in participating in next steps. As Avista continued to weigh the possibility of this approach being feasible, as a way to delay the replacement of its

System, it ultimately determined that commencing with the research and planning for the replacement project was a prudent course of action.

Q. Why did Avista consider the timing of the replacement project to be appropriate?

A. The decision on timing was influenced by many factors, including, among other considerations: the window of availability of employee and contract technical resources; the timing of the expiration of the long-term services contract with Hewlett – Packard for System support; the continued accumulation of business and service risks associated with operating the legacy System; the increasing complexity and replacement costs associated with its continued operation, and the very-limited capability of the legacy System to deliver additional customer service options, both present, and into the future.

Q. Was the Company's replacement project unique among peer utilities?

A. No. Nationwide, many utilities had undertaken the same effort in replacing their Customer Information Systems, and many were replacing systems installed around the year 2000, a technology 'generation' newer than Avista's. Several utilities in the Northwest were among

those engaged in some phase of a major replacement project.

Q. Did the Company assess the experience of others to help avoid some of the pitfalls associated with replacing these large information technology Systems?

A. Yes. The Company took advantage of shared industry knowledge, reviewed case studies, and conducted its own in-depth interviews with several peer utilities to gather a base of 'lessons learned.' This pre-project research helped Avista identify and incorporate key measures into the design and management of its replacement project, to both circumvent and help mitigate these challenges.

Q. What initial steps did the Company take in researching and evaluating potential replacement software solutions?

A. An early step involved retaining a firm with proven expertise in this discipline to assist the Company with the complex process of developing a detailed list of business requirements and then evaluating and selecting the right combination of products and vendors to best meet them. A detailed request for proposals was developed from this initial work and sent to leading application and

services vendors in September 2010. Avista selected Five Point Partners[2] from those firms submitting proposals.

Q. What additional activities were required to support this evaluation?

A. Avista and Five Point spent two months working with employee teams to develop a detailed inventory of the range and complexity of the Company's business processes. This inventory was used to develop the "Current State Map" that included every work process in the business, and every technology requirement needed to support it. These results were included in the technical specifications that accompanied the Request for Proposals sent to vendors. The current-state map included over 200 work processes and approximately 3,500 individual process steps or system requirements.

Q. Please list the vendors who responded to the Request for Proposals

A. Avista received responses from vendors on October 28, 2011, and immediately began the review and evaluation process. Below is a list of the vendors who responded and the solutions and roles they proposed for

[2] Five Point Partners is a consulting organization serving the utility, mining, revenue management, and transportation industries, offering a full life cycle of highly-focused enterprise consulting services from IT assessment and analysis, to implementation and post go-live support services.

delivering a solution set to Avista. A detailed description of the proposal solicitation and review process, as well as the final evaluation and selection of vendors is provided in Exhibit No. 10, Schedule 1, beginning on page 27.

Vendor	Product or Service Offering	Customer Information System Application	Enterprise Asset Management Application	Mobile Work Management Application	Other Vendors
IBM	Systems Integration	**SAP** Customer Relationship & Billing (CR&B)	**SAP** Enterprise Asset Management (EAM)	**ClickSoft** Mobile Work Management (MWM)	---
IBM	Systems Integration & Software Applications	**SAP** CR&B	**IBM** Maximo Asset Management	---	---
EP2M	Systems Integration	**Oracle** Customer Care & Billing (CC&B)	**Oracle** Asset Management	**Oracle** MWM	---
Wipro	Systems Integration	**Oracle** CC&B	**IBM** Maximo	**Ventyx** Service Suite	---
HCL AXON	Systems Integration	**SAP** CR&B	**SAP** EAM	**ClickSoft** MWM	Technology Associates
HCL AXON	Systems Integration	**SAP** CR&B	**Meridium** Asset Management	**ClickSoft** MWM	Technology Associates
HCL AXON	Systems Integration	**SAP** CR&B	**IBM** Maximo	**ClickSoft** MWM	Technology Associates
Sparta	Integration Services	**SAP** CR&B	**SAP** EAM	**Ventyx** Service Suite	Vesta Partners
Logica	Software Application	---	**Logica** Asset Management	---	---
Meridium	Software Application	---	**Meridium** Asset Management	---	Partners with Wipro
HPES	Systems Integration	---	---	---	General Services Only

Q. How were the proposals evaluated?

A. In its initial review, Avista's Project Compass team evaluated and scored each proposal according to

detailed criteria, grouped under four global Project criteria:

Functionality – Assessment of the proposals as meeting Avista's Minimum Requirements, Functional Capabilities, Project Drivers, Customer Service Fit, Enterprise Asset Management Fit, Mobile Work Management Fit, and Technical Fit.

Technology – Evaluation of the technical hardware and software needs and costs, and technology implications of the proposals, with respect to Avista's core information technology strategies.

Implementation Partner – Assessment of the vendor's implementation strategy, installation approach, capabilities, timeliness, staffing, and compatibilities with Avista's project plans.

Cost – Evaluation of the vendor's proposed cost as an element of the initial screening.

Q. What replacement applications did Avista select?

A. Avista continued its detailed evaluation of proposals, interviewed prospective vendors, and evaluated various possible combinations of application solutions and vendors, in the process of making its final selections. Oracle's Customer Care & Billing application was chosen to replace Avista's legacy Customer Service module, and IBM's Maximo asset and work management application was selected

to replace the Company's Work Management System and its Electric and Gas Meter Application. In addition to the applications, Avista retained the services of EP2M and IBM to support the installation and integration of the new Systems. Having completed the selection/procurement phase, Avista commenced with the activities of implementing the new Systems.

Q. What were the early activities of the Implementation Phase?

A. They focused on installing and configuring the new Oracle and IBM applications, and the custom programming required to support application extensions and integrations. Before this work could begin, however, Avista had to complete an eight-month effort known as "design," in which the business processes inventoried in the Current State Map were mapped into the new Systems. This was performed by cross-functional teams of employees who were also responsible for identifying the applications, data and integrations with all other systems that were required to perform each step of every business process. This work produced a detailed list of technical system requirements for each process step. The technical capabilities of the Customer Care & Billing application and the Maximo application were then evaluated against

these detailed lists of technical requirements. In the majority of cases, the applications were able support the requirements of a process step within their off-the-shelf capabilities. For these processes, the Company was able to move directly to the work of application configuration.

Q. Please describe the work of configuring the applications.

A. Configuring the application initially involves selecting parameters, embedding algorithms, or entering data to enable the logic of the application to perform the functions in sequence required by the Company's various work processes. The applications are designed with a series of input tables that organize the process of setting configuration parameters. Each input table, which could represent one particular type of customer service agreement, for example, may have up to 100 individual, flexible, and configurable fields. Configuring each field requires entering from one to several individual values, instructions, or algorithms to establish the future of the new base System. Each field in each table is often cross-linked with content in dependent fields in complementary tables, creating a complex of dependencies between many multiples of tables and fields. This initial work requires the person entering the configuration settings on

a particular table to work iteratively and sequentially in configuring the dependent fields in the other tables in one integrated work flow. As one example of the workload involved, it required one technician working full-time over six months to configure the existing rate tariff settings into the new System for each of the 142 different Avista service agreements across our jurisdictions. Considering the Customer Care & Billing application has 1,686 configuration tables, containing 12,158 configurable fields, the magnitude and complexity of this task is quickly evident.

Q. What was the value of using off-the-shelf applications when they required so much specialized configuration?

A. Today's commercial off-the-shelf computer applications offer many advantages to the alternative of developing proprietary, customized software. First, even though configuration is labor intensive, it is only a fraction of the labor that was expended by the vendor to develop the programming code of the base application itself. The next significant advantage, is that the cost of developing the base application is shared among all of the vendor's user client companies, like Avista. These applications are also compatible with the "enterprise

service bus" architecture of today's information technology systems, and are designed to be integrated with other enterprise applications and systems (e.g. customer service, financial, and supply-chain applications). Client users are also part of a "users community" where they can share their experience with the application, identify problem areas and glitches, and suggest system modifications and enhancements. Finally, the vendor provides periodic technical updates of the applications for its client users, driven in part by the input shared in the user forums, and at a very reasonable shared cost. While these periodic system updates provide high value at low cost, the value can be substantially diluted by the additional complexity and work required to support customized programming for system extensions.

Q. What is meant by "Customization" and "Extensions"?

A. As described above, while there is considerable flexibility within the application's off-the-shelf capabilities to accommodate a range of business processes, many were complex enough that they required programming of software code outside the application itself. This programming is referred to as "customization," and the work-process capability enabled by this custom code is

referred to as an “enhancement” or “extension.” All of the customized programming required to support Avista’s use of the vendor applications was referred to as application “development.” The process of development is complex and labor intensive, and began with a description of the process steps that a particular extension would perform (its system requirements). Each set of requirements proceeded to the contractors’ offshore development staff where it was translated into a technical specification used to guide the development of the actual programming code for the extension. Once the development staff has written the code, the contractor performed what is known as unit testing. The code, along with defects identified in unit testing, were returned to the development staff for analysis and repair. When those defects were repaired, the code was again subjected to unit testing and the next tranche of defects was identified and returned for repair. Because the initial base program code was extremely complex, this iterative process was very labor intensive and time consuming.

Q. Did Avista anticipate that extensions would be necessary at the time it decided to purchase the Customer Care and Maximo applications?

A. Yes. Even though the Company went through an exhaustive process, as described above, to ensure the selected applications had the capabilities necessary to support Avista's business needs, the Company was fully aware that any application it selected would require the development of extensions.

Q. Did Avista make an effort to manage the number of extensions required?

A. Yes. The Company was committed to capturing the value delivered by implementing off-the-shelf applications, and accordingly, our goal was to optimize the number of extensions required. To accomplish this, the Company evaluated each circumstance where the need for an extension was identified, and determined if it could be avoided by changing Avista's work process. In some instances, it was either impossible or not cost effective to change the work process. But in others, the need for an enhancement was eliminated by redesigning the work process so the steps could be accomplished within the capabilities of the application. The effort required to change work processes was significant, however, because each process often impacted the workflow of many departments across the Company. For each process that was changed, Avista organized individual employee teams,

representing the multiple departments affected, to redesign the structure to be effective for customers and the Company, and compatible with the applications.

Q. What were some of the other key Implementation activities?

A. In addition to configuring the applications, and developing the coding required for the extensions, the Project team engaged in the work of integrating the applications, and began performing conversions of all necessary data.

Q. What is involved in the work of applications integration?

A. Integration requires the development of custom programming code that functionally connects the Maximo and Customer Care & Billing applications with each other, and with the approximately 100 systems that support the Company's customer service and business operations. An 'integration' refers to the connection between separate computer applications that allows them to work in concert to perform allied functions. Integrations involve exchanges of data, transmission of instructions or changes in state, performance of computations and other algorithms, and myriad other shared functions. In addition to integration connections between applications, this work

also encompassed the development of the Company's "enterprise service bus." The latter is essentially an integration network shared by the integrated applications. Some of the systems integrated with the Maximo and Customer Care & Billing applications, include the Avista customer website, the Company's various internal systems such as financial applications and databases, supply chain, crew dispatch and outage management reporting, systems from a range of financial institutions used by the Company and our customers, and the many vendors who support our delivery of natural gas and electric service, such as bill printing and presentment.

Q. What was involved in the data conversion process?

A. All of the Company's existing data, whether customer account information, energy use history, electric and natural gas facilities data of all types, mapping system information, and regulatory and compliance information, etc., had to be transferred from existing computer hardware and data bases, such as the Company's mainframe systems, to new data formats, databases, and computer platforms that are connected with the new applications. First, the data in Avista's existing databases was mapped according to where it would

eventually reside in the new database systems. The data were then extracted and loaded into the new systems, and the integrity of the loaded data was validated for accuracy. Defects in data conversion were identified in the process, defects were repaired, and the data load/validation exercise was repeated.

Q. Please describe the work of testing the new application Systems.

A. There are three major areas of System testing that all played a critical role in the successful implementation of the new applications. These are known as “System Testing,” “Systems Integration Testing,” and “User Acceptance Testing.”

When the work of configuration was complete, Avista and its contractors commenced with System Testing. The purpose was to ensure the applications performed properly *as they had been configured* to support Avista’s business processes. Testing focused on identifying and repairing the technical defects that arose during configuration of such a large and complex System. The process simulated individual business functions, each known as a “test case,” and tracked the defects reported during the exercise. System Testing for the Customer Care & Billing application required Company employees and contractors to

write and test over 4,300 individual test-case scenarios. A similar set of approximately 3,800 test cases unique to the Maximo application also had to be developed and tested. In the testing process, defects were identified and analyzed, the root cause was isolated and repaired, and the test case was run again until it was defect free.

Systems Integration Testing occurred next in the sequence and was similar to the process used in System Testing. But instead of focusing on configurations, it tested the custom integration code to ensure the new applications performed properly with all of the other integrated systems. The number of System Integration test cases developed for the Customer Care & Billing application was over 2,400. These test cases were completely different from those developed for the System Testing. Approximately 800 unique test cases were developed for testing the system integrations with the Maximo application. The process of identifying and remediating defects and conducting re-testing was similar to the process used for System Testing.

In the final testing phase, User Acceptance Testing, Avista employees who would be using the new System to serve our customers, performed mock business transactions on the completed System as it would function when

implemented. User Acceptance Testing had the twin objectives of scrubbing the Systems further to identify and repair any critical defects, and to identify and implement changes to the Systems that would make them more user friendly and function more smoothly and efficiently. Over 11,000 individual test cases were developed and executed during the course of testing for the Project.

Q. Very briefly, what was the purpose of creating the reporting templates?

A. A diverse set of management reports is produced by departments across the Company, on a daily, weekly, monthly, quarterly, and annual basis, to meet a broad range of financial, regulatory, and managerial requirements. A specific application is required to produce each of these reports. Because Project Compass was changing the organization and storage of the Company's data, its customer, asset and work management applications and systems, and the ways these systems were integrated, all of the applications that produced these management reports had to be re-developed. There were 155 separate reports that had to be produced relying principally on information from the Customer Care & Billing application, and 60 reports that had to be produced using data primarily from Maximo. The program coding required to

produce each individual report, along with the verification of the data conversion, had to be tested and repaired in the same iterative manner described for the other configuration and enhancement testing procedures.

Q. Please describe the training programs associated with Implementation.

A. Like testing of the new Systems, timely and comprehensive employee training for the new applications and new work processes was critical to successful implementation. Avista and its contractor designed the content of the training modules, and training sessions commenced in the second quarter of 2014.

Q. What was Avista's initial capital budget for the overall replacement project?

A. A budget of $80 million was approved on December 6, 2012 for the capital replacement costs associated with Project Compass. That initial budget allocation among key Project activities is provided in Exhibit No. 10, Schedule 1, Attachment 15.

Q. Why didn't the Company authorize an initial project budget at the time it decided to replace its legacy System?

A. Although Avista discussed potential costs of the project early in its inception, and approved preliminary

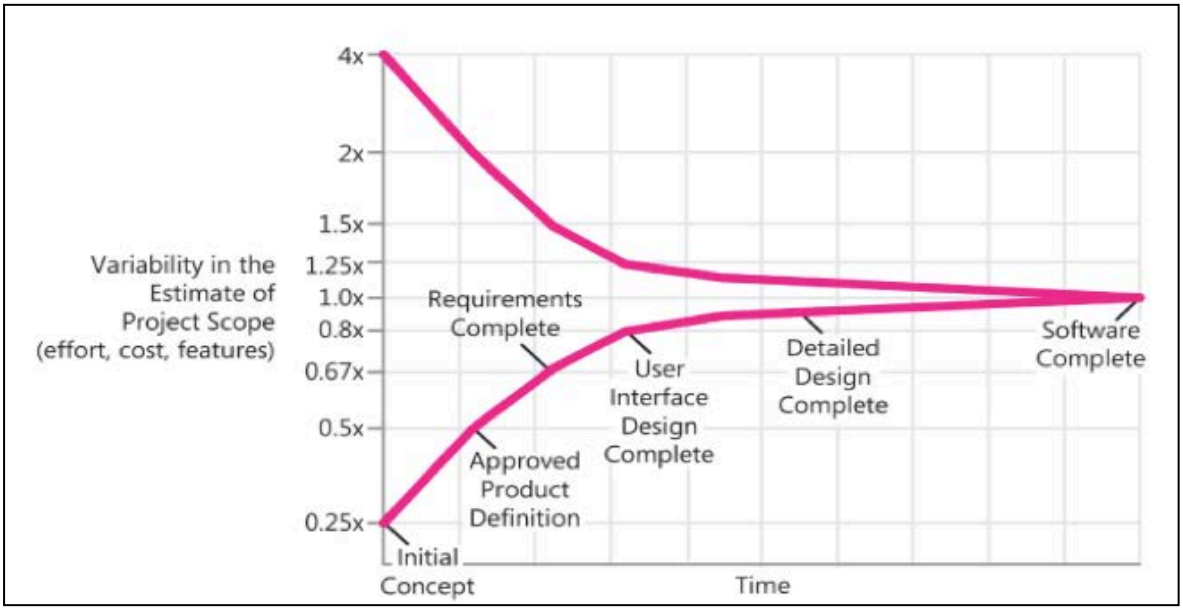
budgets through the course of Project development, it did not establish a formal capital budget until the Project was more defined. Avista had learned through its peer utility interviews, and from the support and advice of outside experts, that organizations commonly undermined the success of their software projects by making cost commitments too early in the development stages. This mistake undermines predictability, increases risk and project inefficiencies, and generally impairs the ability to manage a project to a successful conclusion.

Q. Is this typical of enterprise software projects?

A. Yes. Typically, early in the scoping of a software project, particular details of the application being designed/installed, detailed knowledge of the Company's specific business requirements, details of the solution sets, as well as the management plan, identified staffing needs, and many other variables are simply unclear. Accordingly, estimates of the potential cost of the project are highly variable. As these sources of variability are further investigated and resolved, the uncertainty in the project decreases; likewise, so does the variability in estimates of the project cost. This phenomenon, widely discussed in the literature and often

associated with author Steve McConnell[3], is known as the "Cone of Uncertainty", presented in Illustration No. 1,[4] below.

Illustration No. 1



As illustrated above, significant narrowing of the uncertainty generally occurs during the first 20-30% of the total calendar time for the project. The uncertainty will only decrease, however, through deliberate and active project research and design, required to further define the scope, requirements, implementation details and estimates of component costs. And, this uncertainty must continue to be constrained throughout the course of the project by the use of effective project controls.

[3] Software Estimation: Demystifying the Black Art. Steve McConnell, Microsoft Press, 2006
[4] id. Figure 4.2, 96.1/751.

Q. In light of this cost uncertainty, how could Avista determine that replacing its legacy system was 'cost effective' for customers well before the formal project scope and budget were developed and the actual final costs could be known?

A. The decision point for the Company in 2010 was whether to significantly reinvest in its legacy technology as the means to defer its ultimate replacement, or instead, to invest in the planning and exploration of options needed to support its replacement. The Company determined, as explained in detail in Exhibit No. 10, Schedule 1, that the timing was appropriate to replace its legacy Customer Information System. The Company's focus then was to assess its needs, evaluate options, and select a set of solutions that would meet the long-term needs of the Company and its customers at the lowest possible cost. At that point, the Company engaged in the progressive stages of project design needed to prudently define the likely scope and potential cost of the replacement project. Through this work, uncertainty around the project was narrowed and potential costs were further refined, to the point that Avista was confident purchasing the selected applications and proceeding with the work of implementation. Even though this was several months before

the budget was approved, Avista had by that time built the foundation needed to initiate a successful project: the ability to deliver a solution that would meet its long-term customer service and business requirements in an optimized approach, and in a manner that would achieve the least cost for its customers.

While Avista believed its initial estimates of scope, timeline and budget for the project were reasonable, and was committed to control the Project to best meet each estimate, it was also cognizant that the success of the project would not be defined by whether or not each estimate, including the budget, was precisely met. In contrast with a 'not-to-exceed' metric, the software budget is a management tool that allows senior leaders to make informed enterprise-level decisions, and that provides an effective tool for the project manager to control project activities in an effort to meet the estimates of each deliverable (timeline, scope, functionality, and cost). In describing the relationship between software project estimates and final results, McConnell states:

> "The primary purpose of software estimation is not to predict a project's outcome; it is to determine whether a project's targets are realistic enough to allow the project to be

> controlled to meet them."[5] "Typical project control activities include removing noncritical requirements, redefining requirements, replacing less-experienced staff with more-experienced staff, and so on."[6] "In practice, if we deliver a project with about the level of functionality intended, using about the level of resources planned, in about the time frame targeted, then we typically say that the project "met its estimates," despite all the analytical impurities implicit in that statement. Thus, the criteria for a "good" estimate cannot be based on its predictive capability, which is impossible to assess, but on the estimate's ability to support project success…[7]

Avista believes it designed and developed such an implementation plan and budget for Project Compass. By this, we mean that the overall Project record would demonstrate its proper research and design, robust planning and estimating, effective management and controls, and that its delivered scope, timeline and cost, would be reasonable, cost effective and prudent.

Q. When did Avista initially expect to place these new Systems into service?

A. A portion of the Maximo asset management application was placed into service in the fall of 2013, and Avista initially targeted September 2014 (which was later revised to July 2014) for the "Go Live" of the

[5] id. At 42/751.
[6] id. At 39/751.
[7] id. At 41/751.

remainder of the Maximo application and the Oracle Customer Care & Billing System.

Q. Did Avista believe that it might ultimately have to push out the Go Live to a later date?

A. Yes, it did. While the Go Live target date was an important project planning and management tool, its successful accomplishment was dependent on every major project activity reaching a critical and timely state of completion. As described above, the major implementation activities, which are highly-interdependent and were being executed in parallel tracks, were in and of themselves large and complex undertakings. In setting the Go Live target date, Avista was cognizant of the compounding nature of the challenges associated with launching such a large and complex system, and of the consequences of proceeding to Go Live before all systems were ready. Accordingly, in the event Avista were to determine there was a critical lag in any of the primary implementation activities, including employee training, data conversion, management reporting, System Testing, Integration Testing, User-Acceptance Testing, application hosting, post-Go Live technical support, or customer communications, it would move out the Go Live to ensure a successful launch of the System.

Q. Would it be uncommon for one of the key activities to be delayed?

A. Not at all. In any complex technology initiative such as Avista's Project Compass, issues were constantly emerging that impacted the estimated completion dates of the many project activities. When this happened, the Compass team had to take deliberate steps to make up time or reduce costs to keep the overall Project on its intended course, scope, estimated timeline, and estimated budget.

Q. Would Avista have considered a decision to push out the Go Live date, or to approve spending beyond the estimated project budget to be a failure in the delivery of the new System?

A. No. The basis for this conclusion lies in the Company's efforts to research and understand the root causes of the failed projects of other utilities, in its systematic application of those learnings to the design of the Project, and the efforts it made to aggressively control the project toward its target scope, timeline and budget. In short, as stated earlier in this testimony, Avista was confident it has selected the best-optimized solution for the Company and its customers, and that it would be delivered at the least cost, irrespective of

whether the project planning targets for the timeline and budget were explicitly met.

Q. Did Avista ultimately extend the Go Live Date during Project implementation?

A. Yes. As mentioned, the Company initially targeted September of 2014 for the Go Live of the remainder of the Maximo application and the Customer Care & Billing system. In June of 2014, the decision was made to extend the Go Live operation for the Project to the first quarter of 2015.

Q. Did the Company also revise the project budget in conjunction with the re-forecasted timeline?

A. Yes it did. In June of 2014, the Company revised the capital cost for the Project to $100 million. In November 2014, the Project budget was revised to approximately $107 million. The Company's Board of Directors supported that budget amount and authorized a spending limit of $110 million.

Q. Has Avista described the factors responsible for adjustments to the Go Live date and project budget?

A. Yes. The discussion is contained in a June 2014 report attached to this testimony as Exhibit No. 10, Schedule 3. As explained in the report, the process of coding extensions for the applications was more complex

than initially expected. Because of this complexity and the volume of code that had to be tested, the process of remediating defects in the code also required more time than was estimated in the initial project plan.

Q. As the Project approached the February 2015 Go Live date, what preparations did the Company make to ensure a successful launch of the new systems?

A. The process of taking new application systems live involves the execution of hundreds of highly-coordinated tasks that must be accomplished within a very short window of time, typically two to three days. In the first steps, the legacy systems are locked from use and the new applications are initialized in what's referred to as the "production" or operating environment. The new applications and their many integrations are then subjected to a final round of comprehensive system tests. Then, the process of extracting, transforming, and moving data from the legacy databases and systems to the new application systems begins, along with the process of validating the data. During this process, referred to as the "Cutover," neither the Company's legacy systems nor the new applications are available to support its normal business operations. As a result, and as customers continue to conduct business with Avista during this

period, several thousand transactions have to be logged manually for later entry into the new systems. Finally, the new systems are enabled and available for service in the Go Live step, while the Company's legacy systems are disabled from service.

Q. Please provide an overview of the communication program Avista developed to familiarize its customers with the new systems?

A. The process began with the identification of changes associated with the new systems (such as the assignment of a new account number) that had the potential to impact customers. An employee team was chartered to accomplish this assessment and it identified 61 points of change, grouped under 13 different categories. The team also developed initial recommendations for each change area that included the need for and timing of customer communications, as well as communication channels. An initial customer communication plan was developed and included key project messages and strategies and timelines for communicating with customers. The Company then organized a customer focus group for participants to review and provide input on the draft communication plan and customer materials. The plan was refined using this feedback and was executed through diverse communication

channels that included residential and commercial/industrial customer newsletters, a bill insert, a direct mailing to all customers with special envelope messaging, a billing envelope for two months with special messaging, on-bill messages, social media including Twitter and Facebook, and additional communications to targeted customer segments via email and direct mail. A key communications channel is Avista's website (avistautilities.com), which provides flexibility in disseminating information to customers in a dynamic environment prior to, during, and following the Cutover and Go Live. The website messaging included a home page banner and targeted landing page with special content, including a video for customers on how to read their new bill. Other customer communication channels included the automated phone system with on-hold messaging. An overview of the communication plan is provided as Exhibit No. 10, Schedule 3, and a timeline showing the individual communication activities is provided as Exhibit No. 10, Schedule 4. An example of the direct-mail communication is provided as Exhibit No. 10, Schedule 5.

Q. Please give a high-level overview of the activities associated with Post-Go Live support.

A. Post-Go Live Support is composed of two principal activities that begin immediately following the Go Live to help ensure the successful implementation of the new systems. **Project stabilization** refers to the work of making needed changes to the application Configurations, Extension code, and Integration code, and then updating the operating applications through new releases to production. **Project support** is focused on providing technical assistance to new users of the new applications, and on processing any application or work process issues that are identified during the course of operations.

Q. Briefly describe the work of project stabilization?

A. During the course of testing the new applications and working through the process of Code Defect Management, the emphasis is focused on repairing defects that are known as “critical” or “blocking.” These defects have priority because the applications and integrations cannot perform properly until the defects are removed. While most of the minor defects (those that do not impair the application’s core business performance),

are also repaired during the testing phase, it is common for some to be held for releases to production that occur after the Go Live.

In addition to these, there are inevitably some new defects that emerge during the early operation of the systems that were not identified during the application testing phase. Plus, the live operation of the new applications identifies some work process improvements that require modification of the application configurations or code. Through this process, the efficiency and performance of the new applications is improved, and important technical knowledge is transferred from the application developers to those who will have responsibility for the long-term maintenance of the systems.

Q. What are the tasks associated with the work of project support?

A. Several integrated technical teams were organized to support new users of the new applications. The support process begins when a user has a question or reports a problem to a group composed of subject matter experts/mentors who can address a range of technical and work process-related questions. This group can in turn rely on two technical support teams representing the

Maximo and Customer Care & Billing applications. These support teams answer technical questions as well as identify the source of a reported problem (e.g. a defect in the application, the need for a work process change, or a training issue). These issues are reported to either the project stabilization group, or the team responsible for managing the Post-Go Live applications, where they are ultimately resolved.

Q. Did the Company anticipate the possibility of a diminution in some service levels associated with the transition?

A. Yes. Even with its comprehensive preparations, Avista understood from the experience of others that such a transition is, at best, associated with at least a short-term decline in some service levels (e.g. call center grade of service). Even with sufficient preparation, the transition involves employees moving from very familiar practices to new work processes, using new software tools, and employing temporary manual work processes. In addition to changes for employees, customers were required to make changes to their accounts, to become familiar with a new bill format, and experience some process changes from those with which they were familiar. This combination can result in more customer

calls and longer call-handle times as everyone becomes more familiar and efficient with the new tools and processes.

Q. Did the Company prepare for these effects?

A. Yes. Avista estimated potential customer call volumes and changes in employee productivity, to anticipate and provide for likely staffing needs. In addition to staffing changes, the Company developed metrics to track its performance following the Go Live, as well as employing new tools (such as virtual hold[8]) to help ease and streamline transactions for customers during the transition.

Q. How would you characterize the overall success of the Cutover activities?

A. In short, this process was very successful. The comprehensive plan developed to coordinate the Cutover activities was very complete and was extremely useful in managing the time and resources needed to complete each of the hundreds of required tasks on a very tight timeline. The learnings from the three previous full dress rehearsals were also invaluable in completing and refining

[8] Virtual hold is the option an on-hold customer can select to retain their position in the call queue and receive a call back from the next available customer service representative.

the plan. Over 300 employees were engaged in support of the Cutover activities.

Q. Were you pleased with the first day of operation of the new systems following the Go Live operation?

A. Yes, very much so. The new systems and work processes, along with Avista's employees, performed very well on the first day of service to our customers. I believe the Company's comprehensive and prudent preparations for a successful transition to the new systems were reflected in the very successful Go Live operation.

Q. What were some of the indicators of the successful launch of the new systems?

A. At the enterprise level, the new systems performed well, not only in directly enabling the required work processes (such as accurately printing customers' bills), but also in their smooth integration and operation with over 100 other allied applications and systems. The "system performance," the measure of the capacity of the computer hardware and network systems to support the new applications "under load," was also very positive. In addition to these measures, there were no blocking defects identified, and there were fewer overall defects than had been anticipated; many of those were resolved before the

second day of operation. Finally, there were far fewer employee calls to the technical support teams than had been expected – an indicator that the employee training program had been highly effective.

From the customer's perspective, Company employees were well-equipped to answer questions, resolve issues and concerns, and perform the desired transactions. As anticipated, the high volume of calls to our contact centers, combined with the additional time spent on each call (associated with the new web format, revised transactions, new account numbers, and new tools and new work processes), resulted in a lower than normal grade of service, longer hold time, and longer average handling time. Even with these expected reductions in service, however, Avista was pleased with its overall performance on the first day of operation, in particular because our actual results were better than the forecast, even though the volume of calls was heavier than had been expected.

Results from the second day of operation were exceptionally positive. The Company's grade of service exceeded our standard (pre-Go Live) benchmark of 80%, and average handling time, which also improved from the first day, was better than had been forecasted. Performance during the remainder of the first month of operation was

essentially on par with the Company's pre-Go Live business operations, a truly outstanding implementation performance. A high-level summary of the launch of the new systems, including customer service metrics for the first five weeks of operation, is provided in Exhibit No. 10, Schedule 6.

Q. When do you expect the capital investment required to implement the new systems to be complete?

A. The last major implementation release of the new applications was completed on May 17, 2015. The close out of the capital investment for the Project is expected to be complete in the third quarter of 2015, following receipt of final invoices associated with the project.

Q. What is the expected final cost for the Project?

A. The Company expects the total capital investment for the Project to be approximately $107 million.

Q. Are there any Project development costs that will continue after the new Systems are in service?

A. Yes. As described in the foregoing testimony and schedules, the scope for Project Compass at Go Live was to replace the functionality of the Company's legacy System. Once the new systems were stabilized, the Company planned to make additional investments to add new functionality, such as the option for customers to choose their preferred

communication channel. Opportunities will continue to be identified, over time, for adding functionality to serve the evolving needs of customers, to improve the efficiency or effectiveness of the new System for employees, or to integrate new or modified applications and systems. As was the case with the Company's Legacy System, there was essentially a continuous capital development effort required to support the System from its inception, to accommodate changing technology, the growing needs of our customers, new regulatory requirements, and the perpetual effort to optimize the value of the investment.

Q. Does this conclude your pre-filed direct testimony?

A. Yes.