Exhibit No. CSH-1T
Dockets UE-160228/UG-160229
Witness: Christopher S. Hancock

BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **AVISTA CORPORATION d/b/a AVISTA UTILITIES,** **Respondent.**	**DOCKETS UE-160228 and UG-160229 (*Consolidated*)**

TESTIMONY OF

CHRISTOPHER S. HANCOCK

STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION

Policy, Electric and Natural Gas Attrition Studies

August 17, 2016

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LIST OF EXHIBITS

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Christopher Scott Hancock. My business address is the Richard Hemstad Building, 1300 South Evergreen Park Drive Southwest, P.O. Box 47250, Olympia, Washington 98504.

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

A. I am employed by the Washington Utilities and Transportation Commission (Commission) as a Regulatory Analyst in the Energy Regulation Section of the Regulatory Services Division.

Q. How long have you been employed by the Commission?

A. I have been employed by the Commission since January 2015.

Q. Would you please state your educational and professional background?

A. I graduated from New Mexico State University in 2013 with a Bachelor of Business Administration degree in Economics. In 2014, I graduated from New Mexico State University with a Master of Arts degree in Economics, specializing in Public Utility Policy & Regulation. Prior to my employment with the Commission, I interned at Southern California Edison's regulatory affairs department, and served six years in the United States Air Force before being honorably discharged.

Q. Have you previously testified before the Commission?

A. Yes. I testified on traditional modified historical test years and *pro forma* capital additions in Dockets UE-150204 and UG-150205, Avista's previous general rate case. I also served as Staff's witness on cost of service, rate spread, rate design, and decoupling in Docket UG-152286, a recently settled general rate case for Cascade Natural Gas.

II. SCOPE OF TESTIMONY

Q. What is the purpose of your testimony?

A. I present Staff's policy commentary and Staff's analysis on attrition adjustments to Staff's modified historical test year revenue requirement models.

Q. Please summarize Staff's policy recommendations.

A. Staff recommends the Commission:

- Reject the use of the Energy Recovery Mechanism deferral balance as a tool to offset rate increases;
- Disapprove of the Company's request to implement two rate increases as the result of this rate case;

- Encourage the Company, in periods of large rate base additions, to adopt a test year in future rate case filings that allows for the *pro forma* period to align with the construction season;
- Approve the Company's proposal for rate changes after this rate case to take effect outside of the heating season;
- Endorse strict standards on the use of *pro forma* adjustments to attrition studies such as those used by Avista and Staff in this case.

Q. Please summarize Staff's recommendations regarding attrition.

A. Staff recommends the Commission include an attrition adjustment to the modified historical test year analysis based on the attrition studies I present. Staff witness Ms. Joanna Huang presents Staff's calculation of the revenue requirements for Avista's electric and natural gas services, which incorporates my attrition adjustment. Staff's analysis indicates that, absent an attrition adjustment, Avista will likely experience attrition and that the forces driving attrition are more likely than not outside of the Company's control.

Q. Have you prepared any exhibits in support of your testimony?

A. Yes, I have prepared nine exhibits.

Exhibit No. CSH-1T is this document, which is my written testimony.

Second, Exhibit No. CSH-2 presents my calculation of an attrition adjustment to Staff's electric modified historical test year revenue requirement model. Exhibit

No. CSH-3 presents my calculation of an attrition adjustment to Staff's natural gas modified historical test year revenue requirement model.

Third, I present Exhibit No. CSH-4 and Exhibit No. CSH-5, the results of my attrition analysis for a twelve month period ending December 2017 for electric and natural gas service, respectively.

Fourth, I present Exhibit No. CSH-6 and Exhibit No. CSH-7. These exhibits show the results of my attrition analysis for a twelve month period ending June 2018 for electric and natural gas service, respectively.

Finally, I present Exhibit No. CSH-8 and Exhibit No. CSH-9. These exhibits provides the growth in types of plant, by FERC account category, for electric and natural gas service, respectively.

Q. How is the remainder of your testimony organized?

A. In Section III, I provide commentary on the relevant policy matters in this case. In Section IV, I discuss what attrition is, and generally how Avista is affected by it. In Section V, I discuss the methodology and results of Staff's attrition studies, including *pro forma* adjustments to the attrition studies

III. POLICY CONSIDERATIONS

Q. What policy topics will you discuss in this testimony?

A. I will discuss three issues relevant to this case: the use of Energy Recovery Mechanism (ERM) balances to offset a rate increase; changing the timing of the rate case cycle; and the merits of a single rate increase rather than several rate increases.

A. Use of the ERM balance to offset a rate increase

Q. Avista is seeking to offset the impact of a proposed rate increase in 2018 by refunding a credit balance from the Energy Recovery Mechanism (ERM) deferral account. Does Staff support this proposal?

A. No.

Q. Has the Commission ever authorized a rebate of the ERM balance to offset a rate increase?

A. Yes. The Commission authorized a rebate from the ERM deferral account in Dockets UE-120436 and UE-140188, rate cases that featured settlements. It is my understanding that the decisions accepting these settlements are not precedent-setting. Importantly, the Commission has never, to Staff's knowledge, authorized such a rebate in a fully litigated rate case.

Q. What purpose does the ERM serve?

A. The ERM allows for the deferral of fluctuations in variable power costs that fall outside of an authorized band around the baseline set in a general rate case. Once the deferred power costs reach a defined total of $30 million, the balance is allowed for

recovery in base rates. The intent of the ERM is to insulate ratepayers from large annual rate fluctuations due to variations in power costs, while offering the utility protection from suffering losses in times of extreme power market volatility.

Q. Is it appropriate to use the ERM balances to offset a rate increase?

A. No. There is no compelling reason to interfere with the function of the ERM as it was designed. The ERM is a tool to blunt the impact of power cost variation, not a tool to temporarily obscure an increase in billed rates.

The ERM is designed so that any credit or rebate balance will offset fluctuations in power costs of a future period. At present, there is a $30 million "trigger" that allows for rebates or surcharges in the event that the balance becomes unreasonably large. The Commission should let the ERM function as it was designed.

The Commission follows the same procedures if the ERM has a debit (surcharge) balance, and it should continue to follow those procedures when there is a credit balance, as there is now. A useful thought experiment is to consider whether the Commission would authorize a surcharge if the balance were equally in the debit direction to offset a decrease in rates, usurping the design of the mechanism. That outcome is highly unlikely.

Q. Could you give an example of why you recommend against using the rebate balance in the ERM, please?

A. Yes. The present balance in the ERM is about $18 million in the rebate direction. The abundant hydro-generation of the Pacific Northwest has many benefits, but in years of drought our power prices can increase rapidly. If hydro-genration is much lower that normal, there will be a greater use of the natural gas plants with higher fuel costs due to greater demand which, in turn, will drive up power costs. In this situation, which is a very real possibility, the $18 million ERM rebate could be replaced with a sizable surcharge balance within a few short months.

If the rebate is granted to offset general rates, it will be a temporary rate decrease and when that rebate ends, customers see a rate increase for that reason alone. If the Company also files for another base revenue increase, there can be the double whammy of a general rate increase plus an additional rate increase due to an expiring rebate. Staff finds this potential situation well within the realm of possibility and does not want to expose ratepayers to that unnecessary risk.

B. Shifting the rate case cycle

Q. Avista has stated that it would like to shift the rate case cycle. Does Staff support the Company's proposal?

A. Yes. Mr. Morris makes the case that changing the cycle of rate case filings will benefit customers by timing rate increases outside of the heating season.[1] Staff finds this line of reasoning appealing because it will afford customers an ample period of time to prepare for increased bills, rather than experiencing a likely unexpected rise

[1] Morris, Exh. No. ___ (SLM-1T) 3:13-17.

in costs just when customers are most vulnerable. Staff has also identified other reasons to encourage Avista to file for rates to become effective outside of the heating season.

Q. What additional benefits to stakeholders would result from a shift in the rate case cycle from winter to summer/fall?

A. Since 2013, there have been eight rate case filings from four regulated energy utilities. The Commission received six of these requests in winter months – defined here as November, December, January, or February. A seventh was filed in March.

Utilities are, of course, not the only parties to these rate change requests. A general rate case places large demands on intervening parties – Commission Staff, Public Counsel, NWIGU, ICNU, and other intervenors, as well as the Commissioners themselves. When rate case filings from multiple companies are made within weeks of one another, that burden is increased further. Federal holidays in November, December, and January also slow down the discovery process for all non-Company parties.

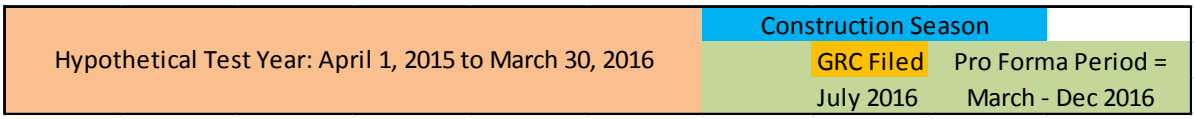
A change away from wintertime filing dates would help spread workload across the year and reduce pressures caused by coincident filings from multiple companies. Intervening parties would likely be better able to represent their constituents and provide deeper analysis and commentary to the Commission in its efforts to produce outcomes in the public interest. Staff supports practices that will lead to a more thorough discovery process, better evidentiary record, and outcomes that further the public interest.

Q. Are there any benefits to Avista in making a rate case filing in the summer?

A. Yes. Were Avista to file a rate case in the summer, it would likely use a different test period than the October-to-September one used in its recent rate cases. A change in test period and filing date could provide for a better opportunity for *pro forma* adjustments in a modified historical test year framework to reflect actual rate base additions. Let's consider a hypothetical example in which Avista files a future rate case in July, and the Company would perhaps use an April-to-March test year.

A disproportionate share of Avista's transfers to plant occur in the fall, as the construction season comes to a close. If Avista files a case in August for a July 1 effective date, Staff, Public Counsel and intervenors would file responsive testimony after the end of the construction season – perhaps mid-January. This sort of procedural schedule would then allow for *pro forma* adjustments to the modified historical test year that would include known and measurable plant transfers made between the end of the test year (March) and the end of the construction season, thereby incorporating plant transfers that apparently tend to occur late in the calendar year. Put more simply, the period for *pro forma* adjustments would be aligned with the construction season, thereby capturing the disproportionate amount of plant additions that occur during this period. The graphic below provides a visual representation of this concept.

Illustration 1



The result would be that the modified historical test year ratemaking approach would be positioned to more accurately reflect the rate base balances in the rate-effective period – thereby mitigating one cause of attrition.

Q. How much does the *pro forma* period actually matter?

A. The table below is adapted from the Company's response to UTC Staff Data Request No. 160, and demonstrates that the *pro forma* period matters quite a bit. The average percent of transfers by month is shown in the first row. The second row calculates the average total percent transfers for the eight months beginning for the month in question. Eight months is an approximate period of time over which *pro forma* additions can be verified. The table shows that an eight-month *pro forma* period beginning in January would generally only be able to capture 55% of the capital additions made by the Company over the course of a year, whereas a *pro forma* period beginning in May would generally be able to capture 75% of those capital additions.

Table 1

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg % transfer per month:	4%	9%	7%	5%	8%	8%	6%	8%	11%	8%	9%	18%
Total % transfer for 8 mos. starting:	55%	61%	60%	62%	75%	71%	72%	73%	71%	68%	68%	65%

Of course, the timing of rate case filings is completely under the Company's control.

C. One rate increase

Q. For both electric and natural gas service, the Company has proposed a rate increase to take effect in January 2017, and another for January 2018. Does Staff agree with this approach?

A. No. Staff proposes a single rate increase effective January 1, 2017, that will allow revenues sufficient to provide the Company an opportunity to achieve a return on equity of 9.20% during a rate-effective period spanning January 2017 through June 2018. Staff recommends that if this approach is adopted, it is done so with the Company agreeing not to file for a rate case in which rates will be effective earlier than July 1, 2018. Such an approach would function as a 2017 rate increase followed by a six month stay-out period.

Staff's single attrition adjustment reflects an average of the results of the attrition study models for the 12 months ending December 2017 and the 12 months ending June 2018. It is appropriate to take a simple average of these figures because they represent equal-sized periods of time, and thus deserve an equal weighting.

Q. Why does Staff oppose the Company's proposal for two separate rate increases?

A. Providing for two rate increases complicates matters for two primary reasons. One, it is administratively more burdensome. Two, it creates a circumstance where customers would experience three separate rate increases over an 18-month period: January 1, 2017, January 1, 2018, and presumably July 1, 2018.

A single rate increase is more straightforward, provides for more predictable customer bills, and avoids the irksome experience of back-to-back-to-back rate increases for customers.

IV. GENERAL DISCUSSION OF ATTRITION

A. Attrition: What it is and why it's important.

Q. What is attrition?

A. The Commission stated in Dockets UE-150204 and UG-150205, Order 05, that "attrition occurs when the test-period relationship between rate base, expenses, and revenues does not hold under conditions in the rate effective period, such that a utility's expenses or rate base grows more quickly than revenues, and a utility would likely have no reasonable opportunity to earn its allowed rate of return."[2]

Typically, modifications to the historical test year are sufficient to generate a revenue requirement figure that provides utilities with a reasonable opportunity to earn the authorized rate of return. Attrition occurs when the traditional ratemaking approach falls short of this goal.

The Commission may grant an attrition adjustment when it finds that *pro forma* adjustments to the historical test year are insufficient. The Commission defined an attrition adjustment as "a discrete adjustment to the modified historical test year that the Commission may use when it determines attrition is present."[3]

[2] *Wash. Utils. & Tranps. Comm'n. v. Avista Corp.*, Dockets UE-150204 and UG-150205, Order 05, 18, ¶ 47 (Jan. 6, 2016).
[3] *Id.* at 19, ¶ 47.

Q. What is an attrition study?

A. A properly-performed attrition study is an exercise in statistics. Staff's attrition study evaluates changes in rate base, expenses, and revenues over a representative historical period. When these changes are found to have a statistically-significant relationship with the passage of time, they are projected forward into the rate-effective period to provide estimates of the Company's operations during that time.

Q. Is Staff's attrition study reasonable?

A. Yes. First, the Commission approved a very similar model in the Company's previous rate case. The Commission described that model as "a detailed and rigorous attrition analysis"[4] that "uses a sound methodology".[5]

Second, the Commission has previously stated that "modeled results are generally acceptable if the model inputs are reasonable and the modeling is comparable in analytical rigor to what is brought to bear in making normalizing adjustments," and that a key feature of an appropriate model is "rigorously matching costs and revenues."[6] Staff's attrition study models have this exact purpose. As has been noted, Staff ensures that all escalation factors are derived from regression analyses that have statistically-significant variables and follow a predictable growth

[4] *Id.* at 37, ¶ 97.
[5] *Id.* at 42, ¶ 114.
[6] *Wash. Utils. & Transp. Comm'n. v. Avista Corp.*, Dockets UE-090134, UG-090135, and UG-060518, Order10, 22 ¶ 49 (Dec. 22, 2009) (referencing power cost models).

pattern over time. In Staff's analysis, the vast majority of the lines-of-best-fit explain well over 90% of the variation in expenses and rate base over time.[7]

Q. Does an attrition study model that produces a revenue requirement estimate for the rate-effective period render moot the traditional ratemaking approach using a modified historical test year?

A. No. Staff's attrition study – or for that matter, the Company's – does not make the analysis offered by a more traditional ratemaking approach moot. A modified historical test year with limited *pro forma* adjustments provides the Commission with a familiar benchmark for analysis. Furthermore, it provides additional scrutiny on specific rate base additions. Staff's attrition study serves as a complement to a traditional ratemaking approach, not as a substitute.

Q. Please describe the differences between the traditional ratemaking approach and the trend-based attrition study in this case.

A. This Commission's traditional ratemaking approach has been the use of a modified historical test year with limited *pro forma* adjustments. Under that approach, a "test year" is chosen to capture the most up-to-date financial data of the utility. Normalizing and restating adjustments are made to the test year Results of Operations to reflect a "normal" or "average" year. This provides a baseline from which more specific adjustments may be made, known as *pro forma* adjustments, to capture known and measurable changes to costs or rate base. The *pro forma* results

[7] The adjusted r-squared values are over 0.90.

of operations is presumed to represent the costs and rate base of the "rate year" or the rate effective period.

Q. If this rate increase produces revenues that allow the utility to earn its target return on the *pro forma* rate base, does that mean those revenues offer a reasonable opportunity to earn the return during the upcoming rate effective period?

A. Not necessarily. The sufficiency of the new rates is based on the assumption that the adjusted levels of revenues, expenses and rate base will be true through the rate year. This assumption has failed in recent years.

Q. Has the Commission approved other means to cure the infirmaties in the pro forma historical test year method?

A. Yes. Many different approaches can be taken under that traditional ratemaking framework to account for the effects of attrition and/or regulatory lag. Some are minor "tweaks" such as the use of end-of-period (EOP) accounting rather than average-of-monthly-averages (AMA) accounting for the determination of rate base. Others move further into the future including the addition of Construction Work In-Progress into rate base, deferred accounting mechanisms for expenses, and the use of multi-year rate plans.[8]

Q. What method does Staff propose in this filing?

[8]Docket UE-150204, Order 05 at 26, ¶ 62.

A. Staff proposes using an attrition adjustment to promote a more reasonable opportunity for Avista to achieve its authorized rate of return.

A trend-based attrition study, such as those used by the Company and Staff in this case, estimates the rate base, expenses, and revenues likely to prevail in the near future. Rather than using a normalized "test year" as a starting point to serve as a proxy for the rate year, a broader historical period (2007 through 2015) is analyzed with the aim of capturing how these elements change over time. The data is drawn from the Commission Basis Reports ("CBR") filed by the Company. If the relationship of the sub-components of the revenue requirements formula are found to be highly explained by the progression of time, then the attrition study can accurately forecast those components into the rate-effective period.

Each of these two approaches, a modified historical test year and a trend-based attrition study, have their own strengths and weaknesses. Together, they are complementary.

Q. Can you provide some examples of the strengths and weaknesses of modified historical test year approach?

A. Yes. As practiced by Staff, the modified historical test year approach identifies and captures only specific major plant additions that are used and useful and the costs of which are known and measurable. This cautious approach places a high degree of emphasis on certainty. The trade-off is that this often does not capture the full extent of rate base additions made prior to the beginning of the rate effective period – a characteristic known as "regulatory lag." Furthermore, this approach produces rate

base balances that fall short of the total balances in place during the rate-effective period. This characteristic is know as "attrition" when it denies the utility of the opportunity to achieve the authorized rate of return.

Q. Can you provide some examples of the strengths and weaknesses of the trending methodology?

A. The strength of the statistical approach in the attrition studies is that it uses the known and measurable performance of operations and the actual plant-in-service of the Company from recent years to produce statistically-sound estimates of future rate base balances, expenses, and revenues. A revenue shortfall in the upcoming period is determined and an attrition allowance may be granted to overcome this shortfall. Establishing this near-term financial allowance will provide the utility with the opportunity to earn its target rate of return.

However, the trending approach behind the attrition study models used by both Staff and Avista is agnostic to the *specific* investments or expenses incurred in the rate-effective period. It therefore does not apply the same level of detailed scrutiny on specific large capital additions that the modified historical test year approach features. Attrition study models succeed in producing more accurate estimates of future rate base balances and expenses at the expense of the modified historical test year's additional scrutiny of rate base and expense items.

The weaknesses of each method are overcome by the strengths of each method, giving support to the attrition study as a complement to Staff's analysis of the modified historical test year.

Q. The modified historical test year, with limited *pro forma* adjustments, has historically served the Commission well in determining revenue requirements. Why is it insufficient to the task today?

A. Over the vast majority of the modified historical test year's history, the utilities in this state had characteristics that are not present today. Prices facing ratepayers were fixed, but revenues grew because load growth was equal to or greater than increasing capital and operating costs. Electrification was actively promoted by state and federal governments. Electrification itself was partially responsible for enormous productivity growth in the economy and the rising incomes to match. Residential ratepayers adopted new, energy-intensive home appliances such as the air conditioner, the television, electric and natural gas stovetop ranges, ovens, and water heaters. All of this load growth demanded and then ate into capacity, where all parties enjoyed large economies of scale. Production plants achieved higher thermal efficiency ratings. Commissions often dealt with the popular task of lowering prices.[9]

Many of these conditions are no longer present. Despite low commodity energy prices, load growth is minimal to flat and many government policies actively discourage load growth. As the building, capital, and appliance stock of customers undergoes turnover, the replacement products are more efficient. Yet production, transmission, and distribution plant continue to depreciate, eventually requiring

[9] EDWARD KAHN, ELECTRIC UTILITY PLANNING & REGULATION 12 (1991).

replacement. Also, utilities are expected to provide a wider range of services and greater reliability than their counterparts of decades passed.

Q. When and how should the Commission grant an attrition adjustment?

A. The Commission's most recent standard for when to authorize an attrition adjustment requires that utilities demonstrate: (1) the cause(s) of attrition and (2) that those causes are beyond the utility's control.[10] In terms of how to calculate an actual adjustment, the goal should always be an unbiased, mathematically sound analysis of the relationships between revenues, expenses, and rate base.

Q. How long should attrition be a salient concern?

A. The response is twofold. First, the phenomenon of attrition will remain a threat so long as the conditions agitating towards attrition remain present. Outside of continuously filed rate cases, there do not seem to be any obvious sources of sufficient revenue growth to the company.[11] Avista has been alleging attrition since at least 2012,[12] and the Company's Net Plant After DFIT in electric operations has grown roughly $50 million per year going back to at least 2007.[13] Operating expenses show fairly consistent growth of roughly $5.5 million per year, again going

[10] Docket UE-150204, Order 05 at 41, ¶ 110.
[11] Morris, SLM-1T 15:21 ("it is necessary to increase retail rates each year").
[12] *See Wash. Utils. & Transp. Comm'n. v. Avista Corp.*, Docket UE-120436, Direct Testimony of Scott L. Morris, Exh. No. SLM-1T, April 2, 2012.
[13] *See* Andrews, Exh. No. ___ (EMA-2) 7.

back to 2007. Avista seems to believe these conditions will be present through at least 2019.[14]

The second and perhaps more interesting part of the question is how long an attrition adjustment should be available to the Company. The current environment of low revenue growth is not temporary. It is the new normal.[15] The Commission should recognize that at some point, prudent business practices would require the Company to adapt to this new normal. However, given that Avista operates in an industry that requires decades-long planning, Staff believes the Commission cannot realistically expect the Company to change course so drastically within only a handful of years. Additionally, rate base growth like Project Compass and the Spokane River Projects are, by definition, not normal.

Rate base growth will eventually decline in the coming years. The combination of a slowdown in rate base growth and a shift towards a filing date that considers a *pro forma* period that aligns with the construction season will reduce the need for an attrition adjustment.

B. Avista and Attrition

Q. Absent an attrition allowance, is Avista likely to experience attrition?

A. Yes.

[14] Andrews, Exh. No. Exh. No. __ (EMA-1T) 16 (showing Avista forecasts rate base growth and increases in operating expenses over the next three years).
[15] Docket UE-150204, Order 05 at 40, ¶ 109.

Q. What has Avista identified as causes of attrition?

A. Avista claims that flat or declining sales, persistent rate base growth, and an increasing cost of doing business are all contributing to attrition.[16]

Q. What does Staff think is causing Avista's attrition?

A. Expenses and capital investments are growing faster than revenues. The growth rates in expenses and capital investments are largely the result of factors that appear to be outside of the control of the utility. Revenue growth is flat. To the extent that revenues are a function of load growth, load growth nonetheless remains low.

Q. Please describe whether and how flat or declining sales could contribute to Avista experiencing attrition.

A. Historically, growth in sales due to electrification, persistent economic growth, and the wide-scale adoption of home appliances like refrigerators, air conditioners, and washing machines, mitigated some of the effects of growth in expenses and rate base. If sales grew at a rate that was reasonably close to the rate of growth in costs, utilities would remain financially sound. These conditions no longer exist. The vast majority of homes and businesses now have electricity and modern appliances. According to the Department of Energy, those appliances use substantially less

[16] Andrews, Exh. No. __ (EMA-1T) 7:14-17 *and* 17:6-15.

energy than just a few decades ago.[17] Sales are thus relatively flat, as Avista has shown in the testimonies and exhibits of Mr. Morris and Ms. Andrews.[18]

However, it is important to note that Avista is a decoupled utility, and as a result is less affected by flat or declining commodity sales. [19] A decoupled utility's revenues are, for all practical purposes, stabilized by design. In fact, a decoupled utility is *required* to reduce rates if quantities sold prove higher than anticipated when rates were initially set.

Therefore, a decoupled utility such as Avista does not need a revenue increase so long as the other parts of the revenue requirement formula (rate base and expenses) remain constant. Flat or declining sales, by themselves, are not a significant cause of attrition for a decoupled utility like Avista. We have engineered the Company's revenue collection to be largely indifferent to commodity sales through decoupling; revenue is more aptly described as tied to growth in customers. Avista does not just have a low sales growth problem – it has a low customer growth problem.[20] The causes of the attrition threat lay in in the relationship between practically-fixed revenues and growing costs.

[17] Modern washing machines, dishwashers, airconditioners, and furnaces use 70%, 40%, 50%, and 10% less energy, respectively, than in 1990. Refrigerators are about 80% more efficient than they were in the 1970s. U.S. Department of Energy, *Energy Efficiency and Renewable Energy*, February 2016. http://energy.gov/eere/buildings/downloads/appliance-and-equipment-standards-fact-sheet, accessed Aug. 4, 2016.
[18] Morris, Exh. No. __ (SLM-1T) 15; Andrews, Exh. No. __ (EMA-1T) 15-16.
[19] Over 81% of Avista's kWh sales since 2006 were on rate schedules that are now subject to decoupling.
[20] Over the 2007-2015 period, Spokane County (a proxy for Avista's service territory) averaged less than 1% annual growth in population. Office of Financial Management, Historical estimates of April 1 population and housing for the state, counties, and cities. http://www.ofm.wa.gov/pop/april1/hseries/default.asp

Q. Please describe whether and how rate base growth could contribute to Avista experiencing attrition.

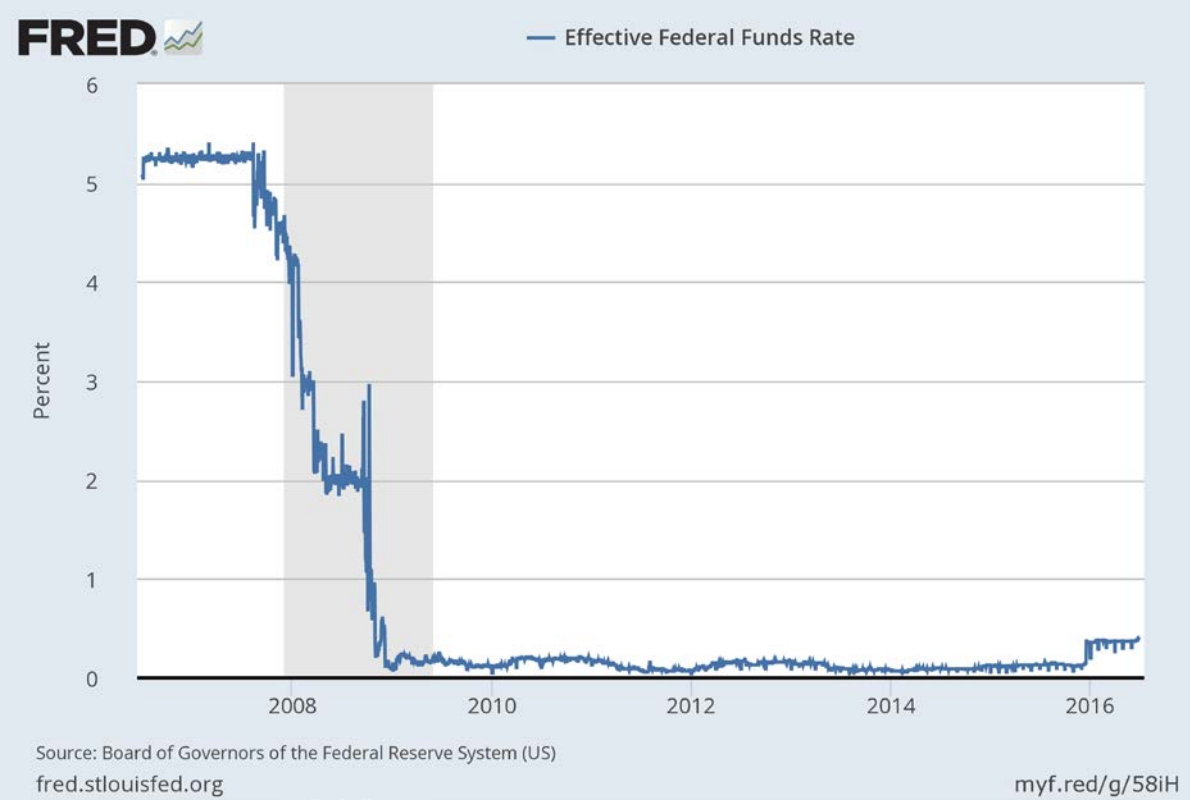
A. When rate base grows faster than revenues, which are virtually flat, the Company faces the prospect of under-recovery. Avista's Net Plant After DFIT growth is roughly $50 million per year going back to at least 2007.[21] Revenue growth has not matched the rate of growth seen in rate base.[22]

Q. What financial conditions may be driving the increased pace of rate base additions?

A. Since the beginning of the 2007-2008 financial crisis, the Federal Reserve Bank has pursued a low interest rate policy with the goal of achieving maximum employment and price stability. This extended period of low interest rates has made investment in long-term capital projects more appealing because the cost of acquiring funds for investment has fallen. These borrowing costs lower the total cost of pursuing a project, which increases the expected return on that project. Indeed, these sorts of outcomes are what is sought by the Federal Reserve's low interest rate policy.[23] The graph below illustrates the change in the effective Federal Funds Rate – the most important benchmark interest rate in American finance – over recent years, where the shaded area represents a period of recession:

[21] Andrews, Exh. No. ___ (EMA-2) 7.
[22] *See, e.g.*, Morris, Exh. No. __ (SLM-1T) 15; Andrews, Exh. No. __ (EMA-1T) 15-17; Andrews, Exh. No. __ (EMA-2); Andrews, Exh. No. __ (EMA-3).
[23] Board of Governors of the Federal Reserve System, Current FAQ's "How does monetary policy influence inflation and employment?" updated Dec. 16, 3015, https://www.federalreserve.gov/faqs/money_12856.htm, accessed August 4, 2016.

Illustration 2



Q. Are there additional factors influencing Avista's capital spending?

A. Yes. A conflating factor is that Avista has improved its financial ratings with the most prominent credit rating agencies. On December 20, 2007, Moody's upgraded Avista from non-investment grade (Ba1) to investment grade (Baa3). Similarly, on February 7, 2008, Standard & Poor's revised Avista Corp. from a non-investment grade (BB+) to investment grade (BBB-).[24] These are by far the largest and most influentiual credit rating agencies. Achieving an investment grade rating from these agencies exposes Avista to significantly more financing sources and lowers the Company's cost of borrowing.

[24] *See* Parcell, Exh. No. DCP-5.

Combined, these effects should push the Company towards accelerated investment in capital projects. Funding for these projects has likely been easier to come by and the cost of that funding is lower. As a result, more capital projects "pencil out."

Q. Please describe whether and how an increasing cost environment could contribute to Avista experiencing attrition.

A. Similar to an increasing rate base, increasing expenses can cause attrition when revenue growth does not keep pace. Over time, this difference in growth rates erodes the Company's ability to achieve the authorized rate of return.

The Company's recent rate cases document that O&M expenses are growing faster than revenues. Ms. Andrews and Mr. Morris provide support for that same premise in their testimonies.[25]

A more detailed review of Avista's expense growth is in the next section of this testimony.

Q. Are the above causes sufficiently beyond Avista's control to justify an attrition adjustment? Why or why not?

A. Staff believes that these causes are more likely than not outside of the control of the Company. Avista is facing a period of paltry load growth, low revenue growth, increasing capital expenditures, and increasing costs. The 2007-2015 dataset used in Staff's analysis is also drawn from Commission Basis Reports that the Company has

[25] Morris, Exh. No. __ (SLM-1T) 15; Andrews, Exh. No. __ (EMA-1T) 15-17.

filed, and the Commission has accepted, over a period in which the Company has sought numerous rate increases. It is thus a dataset taken from a time over which the the Commission and the intervening parties have closely scrutinized the Company's operations. The consistency and low variability of growth in this dataset, and the strength of that growth's relationship with time lend support to the claim that these factors are outside of the control of the Company.

While the modified historical test year framework provides a better avenue for evaluation of *specific* changes to rate base and expenses, the revenue requirement produced in this case, absent an attrition adjustment, is likely to be insufficient to provide a fair opportunity to achieve the authorized rate of return.

V. ATTRITION STUDIES

A. Methodology

Q. How do the attrition studies used by Staff and Avista attempt to identify and quantify attrition?

A. Both Staff and Avista largely adopt the approach used by Staff in Avista's last general rate case, Dockets UE-150204 and UG-150205. That is, both studies apply regression analysis to evaluate prevailing rates of growth in expenses and rate base. Future revenues are based on future billing determinants estimated in the Company's load forecast. The revenue shortfall in the attrition study is the difference between expected revenues at current rates, and the revenues required to make the Company whole at the estimated levels of rate base and expenses.

Finally, the estimated revenues, expenses, and rate base balances found in the attrition studies are then compared to results of the traditional ratemaking approach.[26] The difference between the two produces the attrition adjustment. In Staff's revenue requirement presentation, this is presented as Adjustment 4.08 in the electric model, and Adjustment 4.08 in the natural gas model.[27]

Staff's analysis in this case includes changes in statistical methodology to provide better estimates of future conditions.

Q. Please summarize those changes Staff proposes in this case.

A. Staff's study evaluates rate base on a more granular level. Rather than project Net Plant After DFIT in total, as the Company does, Staff's study estimates the components of Net Plant, such as distribution plant in service, for the rate-effective period. Escalating the individual components results in greater accuracy, because of the strong relationship these elements have with time. This provides for more detailed analysis of the drivers of rate base growth.

Q. What are some key premises in Staff's attrition studies?

A. Staff's attrition study model relies on the the following premises:

1. The historical period (2007-15) provides an appropriate and thorough data set from which statistical inferences can be made.
2. The statistically-significant relationships found in the historical period are strong enough to inform ratemaking in the near term.

[26] Power supply costs are excluded from the calculation.
[27] Huang, Exh. Nos. JH-2 and JH-3.

Q. What support is there for the first premise above?

A. In Avista's previous rate case, Staff used a period of 2009-2014 as a historical period, whereas the Company used 2007-2014. In discussing this difference, the Commission stated in Order 05 that "we agree with the Company's time period rather than that of Staff."[28] The Commission found the use of the longer dataset more appropriate for use. In this case, we expand the dataset by one more year to include 2015.

In addition to that clear guidance from the Commission, Staff in this case has a second reason to adopt 2007-2015. The year 2007 represents the final year of operations that drove credit ratings agencies like Standard and Poor's and Moody's to elevate Avista's credit worthiness rating to investment grade.[29] This period is therefore a period over which, in the eyes of major credit ratings agencies, Avista performed in a consistent and financially sound manner.

Q. What support is there for the second premise above?

A. Staff believes that the statistically-significant relationships in the historical period are strong enough to inform ratemaking in the near term for two reasons. The first is that the Commission accepted such practice in Avista's most recent rate case. In discussing Staff's attrition study in that case, the Commission commented that "Mr.

[28] Docket UE-150104, Order 05 at 42, ¶ 114.
[29] Staff obtained the specific dates through discovery. Mr. Thies also includes some detail of Avista's credit ratings in confidential exhibit MTT-2. Directy Testimony of Mark T. Thies, Exhibit No. ___(MTT-2C)

McGuire's attrition study uses a sound methodology for developing an escalation rate from historical data."[30]

Additionally, Staff's attrition study in this present case only uses escalation rates when the explanatory variables for the underlying lines-of-best-fit (from which the escalation rates are developed) are statistically significant. Staff's stance is a principled one: it is only appropriate to escalate a subcomponent of the revenue requirement formula when there is a statistically-significant relationship between the growth in that subcomponent and the passage of time.[31]

Q. Avista and Staff use similar attrition models, albeit with some notable differences. What are the major differences between Staff's attrition study and Avista's attrition study?

A. The major differences in Staff's attrition models are:

1. An expansion of the historical data used, to incorporate the Company's Commission Basis Report filing for the 12 months ending December 31, 2015;[32]
2. Evaluation of rate base components on a more granular level and escalation of the sub-components of Net Plant, rather than just net plant, for the rate-effective period;

[30] Order 05, UE-150204, at 42 ¶114.
[31] Time is represented by an independent variable corresponding to the given year. An alpha of 0.05 is used.
[32] Avista used a 12-months ending September 30, 2015, as that was the most up-to-date information when the Company made its filing. Andrews, Exh. No. __ (EMA-1T) 22:4-8. Staff anticipates that Avista will adopt Staff's approach here on rebuttal.

3. Higher standards on the acceptance of the Company's proposed "After Attrition Adjustments" combined with a method of calculation that incorporates Staff's more granular analysis on the growth of specific ratebase components;
4. The addition of a growth factor in natural gas service for Other Revenues;
5. The use of a mix of linear and polynomial functions, rather than only polynomial functions, in the lines-of-best-fit in the natural gas attrition model;
6. A change in the calculation of final revenue requirement figures, so as to present customers with one single rate increase rather than two;
7. A change in the O&M escalation factor, to more heavily consider the recent O&M performance of the Company;
8. Presentation of the attrition adjustment as an adjustment to the modified historical test year.

Q. Please explain the first change, the incorporation of the 2015 Commission Basis Report.

A. Due to the timing of this rate case, Avista simply did not have the information available to put forth an attrition study that incorporated the full calendar year of 2015. Circumstances were similar in Avista's last rate case, and Avista ultimately updated its position on rebuttal to incorporate the most recent full year of operations (2014) at that point.

Upon availability of the 2015 Commission Basis Report ("CBR") results, Staff issued UTC Staff Data Request No. 30, which requested that the Company update its analysis to incorporate 2015 CBR results.[33] This change allows Staff's attrition study models to draw from a broader dataset, thereby resulting in more accurate estimations. Additionally, including calendar-year 2015 allows the analysis to incorporate more recent results of the Company's operations.

Q. Please explain the second difference between Avista's and Staff's attrition studies, the evaluation of rate base components on a more granular level.

A. The Company uses a single growth factor for all Net Plant (After DFIT) components. For example, the growth factor used for Transmisison Plant in Service is the same growth factor used for Distribution Plant in Service, despite the fact that these individual components are growing at different rates. This is, however, consistent with the approach taken by Staff and accepted by Avista on rebuttal in the 2015 rate case.

In this case, Staff develops unique escalation factors for each of these elements. In making this change, the Commission can evaluate the growth in rate base components individually. For the 2017 and 2018 electric attrition models, this can be seen on page 2, at lines 32 through 45, in Exhibit Nos. CSH-4 and CSH-6. For the 2017 and 2018 natural gas models, this can be seen on page 2, lines 32 through 41, in Exhibit Nos. CSH-5 and CSH-7.

[33] The Company's response to Staff DR 30 made other updates as well. The Production/Transmission ("PT") ratio was updated, which shifted more assets towards a Washington allocation. The conversion factor was updated as well, which had the effect of increasing the revenue requirement.

This step is helpful because it informs later analysis in the growth of particular types of rate base – for example, allowing the Commission to view growth in distribution and production plant separately. Rather than showing simply that Net Plant is increasing, Staff's analysis shows the differing rates at which the components of Net Plant are increasing. If the Commission finds that the Company has not justified escalation factors for some types of plant – as it did for electric distribution plant in Avista's previous rate case – it may "zero out" the escalation of those types of plant, while retaining escalation rates that more appropriately reflect the anticipated growth for the remaining rate base elements.[34]

Staff's more granular approach is also statistically valid. The resulting escalation factors are derived from lines-of-best-fit for each component of plant growth while ensuring that the explanatory variable remains statistically-significant. Distribution plant is escalated in a manner that best reflects trends in distribution assets, and transmission plant is escalated in a manner that best reflects trends in transmission assets.

Additionally, the growth in production plant will be particularly helpful in the consideration of a *pro forma* adjustment to the attrition study as Avista proposed, and which I discuss later in my testimony.[35]

Q. Please comment on the third difference, Staff's analysis of "After-Attrition Adjustments".

[34] Docket UE-1502014, Order 05 at 44, ¶ 120.
[35] The Company's case refers to this type of adjustment as an "After-Attrition Adjustment."

A. Staff finds that the Company's application of an After-Attrition Adjustment has room for improvement. Additionally, Staff has recommendations on when and how such adjustments should be applied. These topics are discussed in greater detail later in Section V, subsection D of my testimony.

Q. Please comment on the fourth difference, the use of an escalation factor for Other Revenues in natural gas service.

A. In its natural gas attrition study model, the Company does not use an escalation factor for Other Revenues, and does not explain why. However, Ms. Andrews' attrition models note "Escalation Factor not used due to irregular growth."[36]

It is indeed the case that the explanatory power of a linear regression model produced using the historical Other Revenues data is lower than that of virtually all other modeled escalation factors in the attrition model. However, the line of best fit for Other Revenues – only for natural gas service[37] – passes a standard test of statistical significance. Staff found that the growth rate in natural gas service in Other Revenues is, statistically speaking, significantly different than zero.

Using an escalation factor on Other Revenues is therefore reasonable and certainly more reasonable than assuming zero. The escalation of Other Revenues has the effect of lowering the attrition allowance, because higher levels of Other Revenues are anticipated in the rate-effective period.

[36] This can be found on the "Other Revenues" tab of each model. Ms. Andrews' Exhibit No. __ (EMA-3) at page 4 and Exhibit No. __ (EMA-5) at page 4 show the Company uses 0.00% as an escalator for Other Revenues.

[37] The explanatory variable in Other Revenues for electric service was not statistically-significant, so it is appropriate to escalate it at a 0% rate on the electric side, as the Company did. *See* Andrews, Exh. No. __ (EMA-2) 4 and Andrews, Exh. No. __ (EMA-4) 4.

Q. Please comment on the fifth difference in Staff's attrition study, the use of a mix of linear and polynomial lines-of-best-fit rather than only polynomial functions.

A. In the last rate case, Staff (and later Avista) used linear lines-of-best-fit in the electric attrition model, and second-order polynomial lines-of-best-fit in the natural gas model.

However, in this case, Staff sought not only to identify a line-of-best-fit that most closely approximated the historical data – we also sought to ensure statistical significance in the explanatory variables that describe those lines.

Staff chose in each instance the line that best approximated the historical data, provided that the underlying variables were statistically significant. In some circumstances, a polynomial line of best fit did not have statistically-significant variables. In these instances, Staff used a linear function to produce the line of best fit, where the explanatory variable exhibited statistical significance.[38]

These changes should provide for a more accurate estimate of Avista's operations in the rate-effective period.

Q. Please comment on the sixth change, presenting customers with one rate increase rather than two.

A. As noted previously, one rate increase rather than two is administratively less burdensome and more transparent for ratepayers.

[38] The level of statistical significance used by Staff is $\alpha = 0.05$.

Q. Please comment on the seventh change, a change in the O&M escalation rates.

A. Staff finds several compelling reasons to diverge from the trend in the historical growth rate over the 2007-2015 period. These reasons are anchored in recent Commission decisions, the Company's own testimony, and utility industry measures of growth in costs. The result is to combine both Avista's trended expense growth with a reasonable, independent analysis of expense trends in the utility industry generally.

Q. Please comment on the eighth change, the presentation of an attrition allowance as an adjustment to the modified historical test year.

A. Staff makes this change because documenting the adjustment with the modified historical test year more clearly presents an attrition allowance as an adjustment to the traditional ratemaking method.

B. Overview of the Results of Staff's Attrition Study

1. Rate Base

Q. Please summarize Staff's analysis and conclusions for rate base.

A. As previously noted, Staff analyzed rate base on a more granular level than the Company's analysis. I analyzed growth rates for rate base subcomponents and then calculated best fit functions and escalation factors for each of those subcomponents. Staff's attrition rate base figure is the sum of projected totals for each of those

subcomponents. A comparison of Staff's analysis of rate base growth and that of the Company's is displayed below.[39]

Table 2

Trended Electric Rate Base Balances (Thousands)					
Staff 12ME 12.2017	AVA 12ME 12.2017	Difference	Staff 12ME 06.2018	AVA 12ME 06.2018	Difference
$ 1,427,258	$ 1,422,148	$ 5,110	$ 1,452,412	$ 1,446,578	$ 5,834

Table 3

Trended Natural Gas Rate Base Balances (Thousands)					
Staff 12ME 12.2017	AVA 12ME 12.2017	Difference	Staff 12ME 06.2018	AVA 12ME 06.2018	Difference
$ 294,954	$ 294,681	$ 273	$ 301,296	$ 301,258	$ 38

2. Expenses

Q. Please summarize Staff's analysis and conclusions for expenses.

A. Staff's analysis shows that expenses are a significant driver of Avista's attrition. The modified historical test year is likely to understate the expenses the Company will incur during the rate-effective period. The Company's expenses are also growing at a rate higher than broad measures of utility costs over the 2007-2015 historical period, and the Company's recent and proven efforts at reducing O&M costs are consistent with broad measures of utility costs.

Q. Is there relevant history for escalating Avista's O&M expenses?

A. Yes. The appropriate rate to use for these expenses was a matter of debate in Avista's most recent rate case, due to a belief that the growth rate of these expenses

[39] This is a comparison of escalated rate base figures prior to any consideration of an "After-Attrition Adjustment" or *pro forma* adjustments to account for the Spokane River Projects.

had a fundamental change beginning in 2013. Ultimately, the Commission authorized an attrition adjustment consistent with one that uses a blended rate for O&M Expense growth. That blended rate was calculated as the arithmetic average of the trends from 2007 to 2014, and the rate from 2013 to 2014.[40] Staff adopts a similar approach in this case.

3. Revenues

Q. Has Staff reviewed the accuracy of the Company's load forecasting?

A. Yes.

Q. Why is it important to review the load forecasts produced by Avista?

A. Avista uses its load forecasts to derive retail revenues for the rate-effective periods. As noted by Ms. Andrews, this is the same approach used by Avista and Commission Staff in the Company's last general rate case.[41] These load forecasts are also used in the traditional modified historical test year methodology, and have been for many years. Because these forecasts are inputs for the calculation of revenues, review of their accuracy is key to the attrition model.

Q. Are Avista's load forecasts predictive?

A. Yes. Staff issued Data Request No. 32 to Avista, seeking to compare the Company's forecasts of consumption and actual consumption between rate schedules. Between 2011 and 2015, the Company's load forecast model of total therms and total

[40] Docket UE-150204, Order 05 at 91, ¶ 297.
[41] Andrews, Exh. No. __ (EMA-1T) 23:13 - 24:3.

kilowatt-hours were accurate within 2%. Estimates of annual customer bills were accurate within 0.5% . The root mean squared error was 1.67% for kilowatt-hours and 1.74% for therms. Estimates of annual customer bills had a root mean-squared error of 0.22% for electric customers and 0.37% for natural gas customers. Within rate schedules, the Company's load forecast was accurate as well. As a result, Staff also adopts the Company's load forecasts for the rate effective period in its attrition model.

C. The Threat of Attrition

1. Attrition in Avista's Electric Operations

Q. What is the nature of the threat of attrition in Avista's electric operations?

A. Growth in operating expenses and growth in rate base continue to be important drivers of the threat of attrition. The growth in expenses appears to be the primary driver of the threat of attrition in Avista's electric service.

Q. Which types of electric rate base are growing most quickly?

A. Over the historical period, intangible plant has grown at the quickest pace, with intangible plant in service estimated to grow by 9.28% during calendar year 2016. When considering the total value of rate base additions, distribution plant in service shows the most growth. The expected growth in distribution plant in service in 2016 would represent 42.69% of all expected growth in Plant in Service, prior to any consideration of "After-Attrition Adjustments." Distribution plant is expected to grow at a faster rate than total plant in service, meaning that distribution plant can be

expected to contine to represent an even larger share of Avista's rate base in the near future.[42]

Table 4 – Estimated growth in Plant in Service in 2016

Category of Plant In Service	Estimated growth, 2016	Estimated addition, 2016 (thousands)	Share of estimated additions, 2016
Intangible	9.28%	$13.544	12.31%
Production	2.03%	$15,809	14.47%
Transmission	4.00%	$16,071	14.71%
Distribution	5.21%	$46,651	42.69%
General	8.13%	$17,289	15.82%

Q. What are the differences between Staff's and Avista's approaches to measuring plant growth in Avista's electric operations?

A. Staff found the growth in particular types of electric plant growth over the historical period. Staff's analysis found the stastically-significant rate of growth for each type of plant, and then developed escalation factors specific to those elements.

Avista's analysis only evaluated growth in Net Plant After DFIT, which does not provide the same degree of insight as to which types of plant are driving rate base growth. Instead, Avista applies the same escalator to all trended components of rate base. A comparison between Staff's escalations and Avista's escalations show the importance of using a specific escalation rate for the respective type of plant. Intangible plant has not grown at the same rate as Production plant, or at the same rate as Net Plant After DFIT. Depreciation and amortization rates vary as well.

[42] Total plant in service is the sum of intangible, production, transmission, distribution, and general plant.

Table 5

		Electric, 12ME Dec 2017			
		Staff Escalator	AVA Escalator	Staff $	AVA $
Plant in service	Intangible	18.56%	7.79%	$ 26,908	$ 11,692
	Production	4.06%	7.79%	$ 31,619	$ 59,880
	Transmission	8.00%	7.79%	$ 32,142	$ 30,772
	Distribution	10.42%	7.79%	$ 93,302	$ 68,433
	General	16.25%	7.79%	$ 34,578	$ 15,938
Accum. Depr. & Amort.	Intangible	17.67%	7.79%	$ (4,407)	$ (1,934)
	Production	8.18%	7.79%	$ (27,876)	$ (26,232)
	Transmission	7.68%	7.79%	$ (9,977)	$ (9,920)
	Distribution	10.03%	7.79%	$ (27,225)	$ (21,312)
	General	12.726%	7.79%	$ (8,957)	$ (5,338)
Net Plant		-	-	$ 140,107	$ 121,979

Table 6

		Electric, 12ME Jun 2018			
		Staff Escalator	AVA Escalator	Staff $	AVA $
Plant in service	Intangible	23.20%	9.74%	$ 33,635	$ 14,615
	Production	5.07%	9.74%	$ 39,523	$ 74,850
	Transmission	10.00%	9.74%	$ 40,177	$ 38,465
	Distribution	13.03%	9.74%	$ 116,628	$ 85,541
	General	20.32%	9.74%	$ 43,223	$ 19,923
Accum. Depr. & Amort.	Intangible	22.08%	9.74%	$ (5,509)	$ (2,418)
	Production	10.23%	9.74%	$ (34,845)	$ (32,790)
	Transmission	9.60%	9.74%	$ (12,471)	$ (12,400)
	Distribution	12.54%	9.74%	$ (34,031)	$ (26,640)
	General	15.33%	9.74%	$ (11,196)	$ (6,673)
Net Plant		-	-	$ 175,134	$ 152,474

Q. Both Avista's and Staff's analysis shows that distribution plant is expected to grow by the largest dollar amount. What explains the growth in distribution assets?

A. Avista supports its claims for the prudency of distribution plant growth by citing reliability concerns and the cost of connecting new customers. [43]. The Company, through the testimony of Ms. Rosentrater, notes the Company's continued wood pole replacement program, compliance requirements, and unplanned maintenance and other externally-driven forces.[44] Additionally, Avista witness Mr. Thies notes that "Avista's plans call for a continuation of utility capital investments in . . . distribution systems to preserve and enhance service reliability for our customers."[45] Reliability is a theme of Avista's case.

As it stands, these are hard claims to endorse or refute, and Staff has previously voiced concern regarding this issue.[46] It is worth emphasizing that the burden of proof on this matter ultimately lies with the Company, and the Company has an information asymmetry that uniquely positions it as the party best able to prove that increasing distribution system costs are out of the Company's control.

To get a better sense of an appropriate level of distribution investment, Staff has begun working with an expert consultant to develop an econometric study which will evaluate a utility's distribution investment given its unique service territory characteristics. This study will estimate a utility's reliability given the circumstances it faces, and this estimate can be compared to a utility's actual reliability performance. Staff will have a better understanding of the overall prudency and efficiency of distribution investment as a result of this work.

[43] Morris, Exh. No. __ (SLM-1T) 13:8-12 *and* 14:15-20. Rosentrater, Exh. No. __ (HLM-1T) 31:14 - 32:11.
[44] Rosentrater, Exh. No. __ (HLM-1T) 34-37.
[45] Thies, Exh. No. __ (MTT-1T) 2:4-5.
[46] *See Wash. Utils & Transp. Comm'n. v. Avista Corp.*, Docket UE-150204, Direct Testimony of Christopher R. McGuire, Exh. No. CRM-1T 21 – 25, July 27, 2015.

Q. Are distribution projects ill-suited for incorporation as *pro forma* adjustments to a modified historical test year?

A. Yes. Despite the fact that distribution is the largest component of plant in service, and that it has historically grown at a faster rate than plant in service as a whole, individual distribution projects tend to be small. These projects tend to not meet the standard for a major project, and are thus not considered for *pro forma* treatment. The result is that the traditional ratemaking method tends to understate distribution plant in the rate-effective period.

Ms. Huang presents Staff's analysis using the traditional ratemaking method. She identifies electric projects that meet Staff's definition of major, and has found that no electric distribution projects to meet this standard – meaning that $0 of distribution projects are given *pro forma* treatment in Staff's modified historical test year analysis.

Q. Staff's more detailed analysis also shows that production plant has grown the slowest over the historical period. Why is this particularly relevant for this case?

A. In this case, Avista proposes an "After Attrition Adjustment" (a *pro forma* adjustment) to the results of the attrition study for the Spokane River Projects. These are all hydroelectric production projects of significant size. Slow growth in this particular type of electric utility asset class lends support to the claim that the historical record does not sufficiently capture the growth in production plant

anticipated by the rate-effective period. This issue is discussed in more detail later in Section V, subsection D of my testimony.

Q. Does Staff have any further detailed analysis on the growth in rate base?

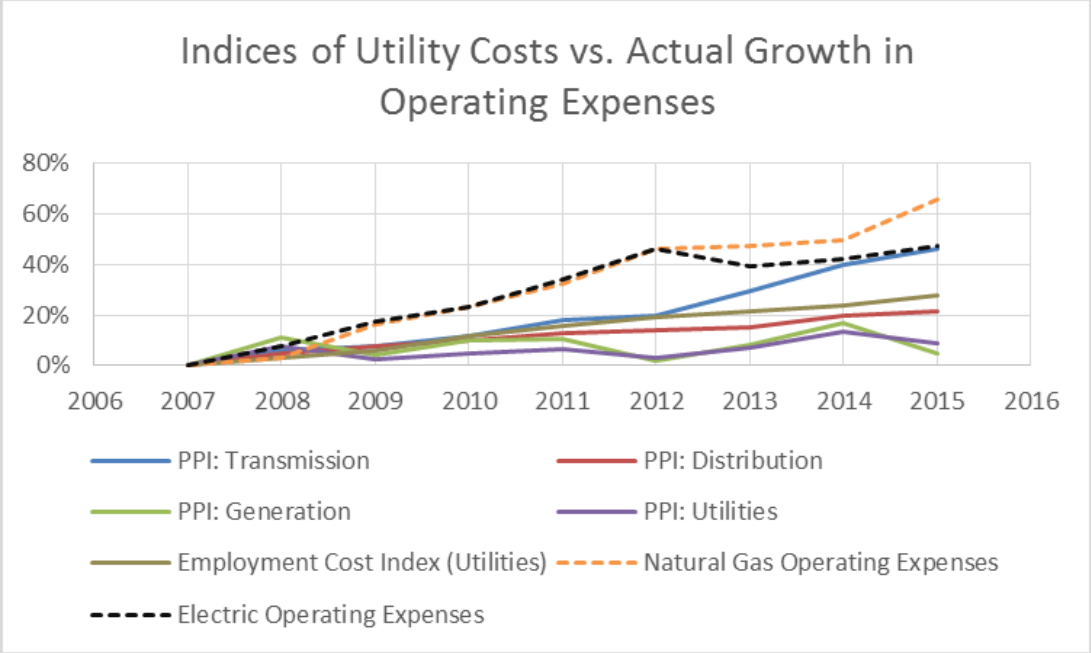
A. Yes. My exhibits provide a more detailed, numerical analysis. Exhibit No. CSH-8 shows growth in Avista's plant in service, by FERC account, over the historical period. For example, my exhibit CSH-8 shows that meters are expected to grow by 6.96% in 2016, faster than Distribution plant as a whole (5.21%).

Q. Moving from rate base to expenses, what is the nature of expense growth in Avista's electric operations, and is that growth reasonable?

A. Staff's attrition analysis shows that the Company's Operating Expenses have grown at a 4.07% rate over the historical period.

The chart below displays several measures of costs that utilities face, and lends support to Avista's claims that growth in operating costs is outside of its control.

Illustration 3



Q. Please explain the above graph, Illustration 3.

A. The illustration above shows four measures of Purchasing Power Index that are specific to utilities. The purple line, labeled PPI: Utilities, is a generic measure for both natural gas and electric utilities,[47] while the blue, green, and red lines measure specific **electric-only** utility functions.[48]

Also displayed in brown is the Employment Cost Index, a measure of compensation costs for employees. This index is specific to utilities.[49] All five indices are collected and maintained by the Bureau of Labor Statistics.

[47] This measure does include water and sewage utilities as well. FRED Economic Data, Federal Reserve Bank of St. Louis, Data series PCU221221 at http://fred.stlouisfed.org accessed Aug. 4, 2016.
[48] Transmission (blue) is data series PCU221121221121; Distribution (red) is data series PCU221122221122; Generation (green) is data series PCU2211102211104. All can be found at FRED Economic Data, Federal Reserve Bank of St. Louis, http://fred.stlouisfed.org.
[49] This measure includes water, sewage, natural gas, and electric utilities. Data series CIS20144000000000I at http://fred.stlouisfed.org.

Finally, the growth in Avista's operating expenses in natural gas service (orange dashed line) and in electric service (black dashed line) are displayed. These two data series are the same data series reported in the Commission Basis Reports.

Q. What conclusions does Staff draw from the above graph/data?

A. Here we see five measures of utility costs, gathered from utilities across the nation by an eminently reputable statistical agency, which all show increasing costs across the same time frame as used in Staff's attrition study model. Avista's natural gas and electric services both show increasing costs in operating expenses across this timeframe that outpace these measures.

It is worth noting how Avista's electric operating expenses slow in growth from 2012 through 2015. This is consistent with the "significant reduction in expenses starting in 2013" testified to by Company witness Ms. Andrews.[50] Importantly, it is also consistent with the two most broad measures of utility costs presented above: Employment Cost Index, and PPI: Utilities. Note that the brown line (Employment Cost Index), the purple line (PPI: Utilities), and the black dashed line (Avista's electric operating expenses) are all roughly parallel from 2012 and on.

Q. What is Staff's recommendation on the escalation of O&M costs for the rate-effective period in electric service?

Staff recommends an adjustment to the Company's historical O&M trend. Operating Expenses are perhaps the component of revenue requirements most under the

[50] Andrews EMA-1T, at 34:8-9.

Company's control. Avista's growth in operating expenses over the 2007-2015 historical period are also above those of broad measures of utility costs. Avista acknowledges the slowdown in growth of O&M expenses beginning in 2013 through the testimony of Ms. Andrews, and that slowdown is consistent with the growth seen in a broad measure of utility employment costs (Employment Cost Index) and inputs (PPI: Utilities).

For these reasons, Staff finds it appropriate to adjust the escalator for electric O&M costs away from what the historical trend suggests, and towards a blended average. A blended average is consistent with the determination by the Commission in Avista's last rate case as well.[51]

The blended average used by Staff is found as follows: one-quarter weight is given to Employment Cost Index, one-quarter weight is given to PPI: Utilities, and one-half weight is given to the historical trend from 2007-2015. The result is a 3.04% annual growth rate[52] – comparable to the 2.42% used by the Commission in Avista's last rate case.[53] This weighted average thus incorporates the historical performance of the utility and the unique circumstances it faces, as well as broad measures of utility operation costs that are consistent with the recent slowdown in electric O&M costs that the Company has acknowledged.

Q. Why use these weights?

[51] Order 05, UE-150204, at 45 ¶123.
[52] A 3.04% annual growth rate translates to an escalator of 6.08% into 12 ME Dec 2017, and 7.60% for 12 ME Jun 2018.
[53] Docket UE-150204, Order 05 at 45, ¶ 123.

A. Applying a weight of one-half to the historical trend is consistent with the method used by the Commission in Avista's last general rate case.[54] The other half of the calculation amounts to an average of the Employment Cost Index and the PPI: Utilities index. The Employment Cost Index is a broad measure of utility labor costs, while the PPI: Utilities index is a broad measure of non-labor costs that utilities face.

Performing the calculation in this manner appropriately weights the actual growth in expenses that Avista has experienced, while also giving an equal weight to a proxy of reasonable growth in expenses across the utilities industry.

Q. Staff was able to evaluate rate base components on a more detailed level. Why hasn't the same approach been taken to expenses?

A. Commission Basis Report results do not lend themselves to more detailed analysis of expenses. Expenses are not reported on the same granular level as rate base components.

2. Attrition in Avista's Natural Gas Operations

Q. What is the nature of the threat of attrition in Avista's natural gas operations?

A. Again, growth in rate base and growth in expenses are the primary drivers of the threat of attrition in Avista's natural gas operations.

[54] *Id.*

Q. Which types of natural gas rate base are growing most quickly?

A. Staff's attrition analysis suggests that distribution plant will be the dominant driver of growth in plant in service.

Table 7 – Estimated growth in Natural Gas Plant in Service in 2016

Category of Plant In Service	Estimated growth, 2016	Estimated addition, 2016 (thousands)	Share of estimated additions, 2016
UG Storage	-0.31%	($79)	-0.27%
Distribution	6.29%	$22,672	78.36%
General	8.39%	$6,339	21.91%

Q. What are the differences between Staff's and Avista's approaches to measuring plant growth in Avista's natural gas operations?

A. Similar to the analysis of electric service, Staff found the growth rates for particular types of natural gas plant growth over the historical period. Staff's analysis found the stastically-significant rate of growth for each type of plant, and then developed escalation factors specific to those elements. Avista's analysis only evaluated growth in Net Plant After DFIT.

A comparison between Staff's escalations and Avista's escalations show the importance of using a specific escalation rate for the respective type of plant. Note that in Staff's analysis, general plant uses an escalation rate based on a linear function, while Avista's broad escalator for Net Plant After DFIT, and Staff's

escalators for underground storage and distribution plant, are based on polynomial functions.[55]

Table 8

		Natural Gas, 12ME Dec 2017			
		Staff Escalator	AVA Escalator	Staff $	AVA $
Plant in service	UG Storage	-0.62%	10.91%	$ (158.4)	$ 2,813
	Distribution	12.57%	10.91%	$ 45,343.3	$ 39,238
	General	16.79%	10.91%	$ 12,677.4	$ 7,984
Accum. Depr. & Amort.	UG Storage	10.29%	10.91%	$ (1,018.9)	$ (1,083)
	Distribution	12.12%	10.91%	$ (14,739.4)	$ (13,214)
	General	15.26%	10.91%	$ (3,164.3)	$ (2,057)
Net Plant		-	-	$ 38,940	$ 33,681

Table 9

		Natural Gas, 12ME Jun 2018			
		Staff Escalator	AVA Escalator	Staff $	AVA $
Plant in service	UG Storage	-0.77%	13.64%	$ (198.0)	$ 3,516
	Distribution	15.72%	13.64%	$ 56,679.2	$ 49,048
	General	20.99%	13.64%	$ 15,846.8	$ 9,980
Accum. Depr. & Amort.	UG Storage	12.86%	13.64%	$ (1,273.6)	$ (1,354)
	Distribution	15.15%	13.64%	$ (18,424.3)	$ (16,518)
	General	19.07%	13.64%	$ (3,955.3)	$ (2,571)
Net Plant		-	-	$ 48,675	$ 42,101

Q. Both Staff and Avista project distribution plant to be the overwhelming driver of additions to Net Plant. What explains this growth?

[55] *Compare* Hancock Exhibit Nos. CSH-5 and CSH-7 *and* Andrews, Exh. No. __ (EMA-3) at 9 and Exh. No. __ (EMA-5) at 9.

A. Distribution is, by far, the largest component of Net Plant and it displays large, consistent growth over the historical period. It is worth noting that in natural gas service, "distribution" plant encompasses what is analogous to distribution and transmission plant in electric service. Mains alone – perhaps most analogous to transmission lines – represented over 49% of 2015 distribution plant additions.

Avista also continues long-standing pipe replacement programs such as the Isolated Steel Replacement project and the Aldyl A Replacement project. Staff's modified historical test year analysis considers both of these projects to be major projects, and the Company also expects both to be major additions to distribution plant in natural gas service in the near-term.

Q. Does Staff have any further detailed analysis on the growth in natural gas rate base?

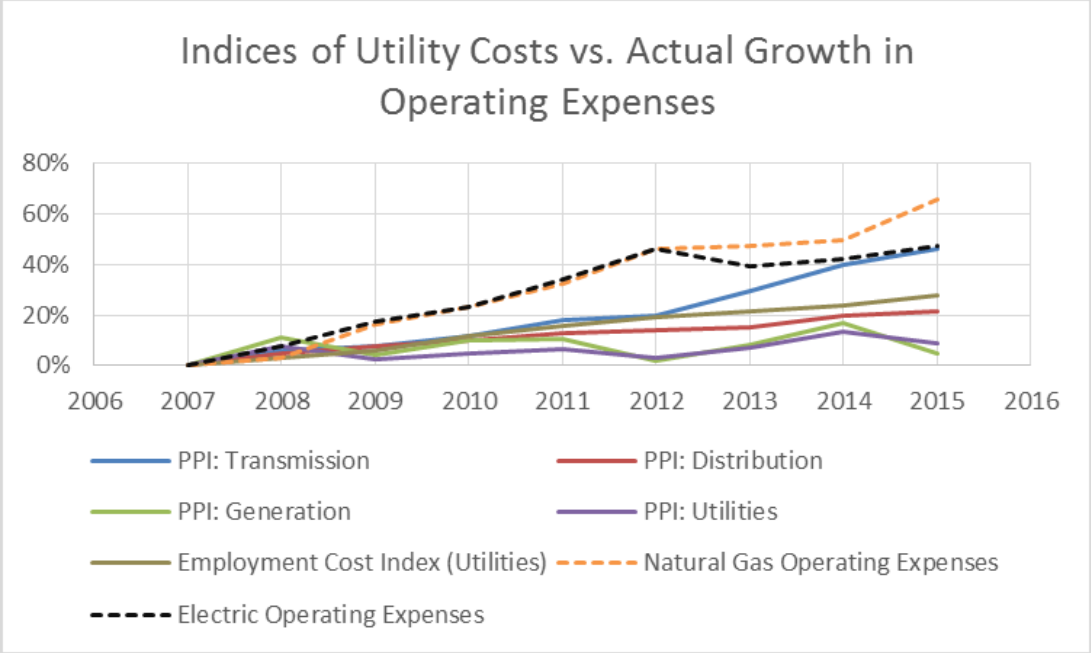
A. Yes. My Exhibit No. CSH-9 shows growth in Avista's natural gas plant in service, by FERC account, over the historical period.

Q. What is the nature of expense growth in Avista's natural gas operations, and is that growth reasonable?

A. Staff's attrition analysis shows that the Company's Natural Gas Operating Expenses have grown at a 4.23% rate over the historical period.

We can refer again to the chart previously shown in this testimony's discussion on electric services.

Illustration 4



Consider now the orange dashed line, representing the adjusted operating expenses found in the Company's Commission Basis Reports from 2007 through 2015. Between 2012 and 2014, we see a mostly horizontal line, representing little to no growth, and consistent with what we observed with electric service. This is consistent with the "significant reduction in expenses starting in 2013" testified to by Company witness Ms. Andrews.[56] And again, it is also consistent with the two most broad measures of utility costs presented above: Employment Cost Index, and PPI: Utilities.

Q. What is Staff's recommendation on the escalation of O&M costs for the rate-effective period in natural gas service?

[56] Andrews, Exh. No. __ (EMA-1T) 34:8-9.

For similar reasons to those in electric service, Staff finds it appropriate to adjust the escalator for natural gas O&M costs away from what the historical trend suggests and towards a blended average.

The blended average used by Staff is found as follows: one-quarter weight is given to Employment Cost Index, one-quarter weight is given to PPI: Utilities, and one-half weight is given to the historical trend from 2007-2015. The result is a 3.46% annual growth rate[57] – somewhat above that of the 2.42% used by the Commission in Avista's last rate case.[58] This weighted average thus incorporates the historical performance of the utility and the unique circumstances it faces, as well as broad measures of utility operation costs that are consistent with the recent slowdown in natural gas O&M costs that the Company has acknowledged.

Q. Why use these weights?

A. The rationale is the same as I note in Section V, subsection C.1., above, for electric service.

D. *Pro Forma* Adjustments to Attrition Models

Q. Ms. Andrews recommends that "After-Attrition Adjustments" be made to the results of the electric and natural gas attrition studies. What is the purpose of such an adjustment?

[57] A 3.46% annual growth rate translates to an escalator of 6.92% into 12 ME Dec. 2017, and 8.65% for 12 ME June 2018.
[58] Docket UE-150204, Order 05 at 45, ¶ 123. In the previous rate case, O&M escalation was not unique to each service.

A. An "after-attrition adjustment" is made to the results of an attrition study due to the belief that the trend lines produced by the analysis do not adequately reflect the near future levels. In this sense, they are analogous to a *pro forma* adjustment in the familiar modified historical test year ratemaking framework.

One reason for an "After-Attrition Adjustment" may be that future capital additions are composed of abnormal projects that aren't reflected in the historical record. Another reason may be that the data from which the historical trend is derived fails to reflect a "new normal" regarding the pace of capital additions.

In Avista's last rate case, an "after-attrition adjustment" was made to accommodate a large capital addition known as Project Compass.

Q. Staff has made it a point to use different terminology for such an adjustment. Why?

A. There are two reasons for this. First, it is to clarify language so that the function of such an adjustment is presented in terms more familiar to those involved in and impacted by this rate case. *Pro forma* adjustments are made in the traditional modified historical test year approach as a way to adjust base figures to more accurately represent figures as they are anticipated to be in the rate year. That is precisely the function served by the "after-attrition adjustments."

A second reason is to emphasize that "attrition" is not a treatment, but rather the phenomenon we wish to treat. "Attrition" is not something granted or given or allowed to the Company; it is a ratemaking problem that, if unaddressed, has the potential to put a utility in financial peril.

Q. What are some reasons to be cautious about the use of *pro forma* adjustments to the attrition study models?

A. The premise underlying the attrition study models used by Staff and Avista in the Company's previous rate case, and in this case, is that the historical record provides a dataset from which statistically-sound estimations of future rate base, expense, and revenue figures can be estimated.

A *pro forma* adjustment to the results of that model undermines that premise. The use of a *pro forma* adjustment is an admission that the model does not accurately capture future figures – in this case, rate base figures. While a *pro forma* adjustment to the results of such a statistical model may nonetheless be found to be appropriate in some circumstances, it should not be a routine or regular matter. The evidence for such an adjustment should be quite strong.

Q. What principles should guide the use of these adjustments?

A. It is not sufficient to say that such an adjustment is for an "abnormal" circumstance; the historical record used by both Staff and Avista spans a period of time in which several events occurred that would have been considered "abnormal" at the time. One such example is that of the $45 million-plus addition of Project Compass, which was transferred to plant in February 2015, and is thus included in the historical record.[59] Because Staff's attrition study (and Avista's, for that matter) is a statistical exercise drawing from a nine-year period over which some "lumpy" plant additions

[59] "Historical record" is the dataset of Commission Basis Reports from 2007- 2015.

occurred, the estimates produced by the attrition models implicitly incorporate the possibility of such "lumpy" plant additions.

In this present case, and in any future cases in which such a statistically-based approach is taken, a party advocating the use of a *pro forma* adjustment should be required to demonstrate that the historical record does not accurately capture the characteristics that the *pro forma* adjustment seeks to correct. Furthermore, the principles guiding *pro forma* adjustments in the traditional modified historical test year method of ratemaking should be adopted.[60] That is, plant adjustments should be major; known and measurable, used and useful, and prudently incurred.

Q. If the Commission were to find that there is reason to incorporate such an adjustment, what should guide its actions?

A. After accepting that such an adjustment is called for, the task then becomes the determination of the size of that adjustment. A *pro forma* adjustment to the attrition study should attempt to capture only the plant addition amount that is above and beyond what the historical trend suggests, and it should do so with enough certainty to justify the deviation from an historical trend.

This means that figure is unlikely to be the entire value of the project, unless perhaps that project is a completely new and wholly abnormal endeavor. A project that provides entirely new services or functionality may meet this standard; AMI has the potential to be such a project. But in most cases, a project being considered for

[60] Docket UE-150204, Direct Testimony of Christopher S. Hancock, Exh. No. ___CSH-1T 9-10. *See also* Docket UE-150204, Order 05 at 14-15 and at 17, ¶ 40.

treatment as a post-attrition adjustment is likely captured, in part, by the growth in rate base due to the use of escalation factors.

Q. What projects are proposed to be included as "After-Attrition Adjustments" by Avista?

A. For electric service, Avista proposes "After-Attrition Adjustments" for a group of projects known collectively as Spokane River Projects, and another adjustment for the electric portion of its Advanced Metering Infrastructure ("AMI") project. A similar adjustment is proposed in natural gas service for the natural gas portion of the AMI project.

Q. What projects is Staff including as a *pro forma* adjustment to the attrition study models?

A. Staff is including a *pro forma* adjustment only for the Spokane River Projects. Spokane River Projects is composed of three independent projects along the Spokane River. These are the Nine Mile hydroelectric dam rehabilitation project, the Post Falls south channel gates replacement project, and the Little Falls powerhouse redevelopment project.

Q. Why does Staff not include a *pro forma* adjustment to the attrition study models for the AMI project?

A. The AMI project does not fit the traditional *pro forma* adjustment principles that I describe in my guiding principles above. The reader may also refer to the testimony

of Staff witness David Nightingale for further discussion on the inappropriateness of including this project into rates.

Q. Avista notes that in the previous rate case, the Commission authorized a "post-attrition adjustment" to the results of the attrition study to incorporate an abnormal plant addition. What constitutes an abnormal plant addition?

A. Revisiting the last Avista rate case can provide some insight.

Ms. Andrews notes that in the previous Avista rate case, Project Compass was accounted for as a "post-attrition adjustment." Mr. McGuire, Staff's witness in that case, was measured in his support for such treatment.

Two elements contributed to Mr. McGuire's belief that Project Compass was an abnormal plant addition worthy of a "post-attrition adjustment." They are the size of the project and the nature of the project. Additionally, Project Compass was of a known-and-measurable size.

The "post-attrition adjustment" for Project Compass represented a $42.058 million addition to total rate base, or 2.86% of the Net Plant found in the previous year's Commission Basis Report. [61]

As to the nature of the project, Project Compass provided new functionality to the Company and its customers. Project Compass provides services to the Company and its ratepayers that simply were not present before it was placed into service. This is another way in which Project Compass was abnormal.

[61] $42.058 million divided by $1.472 billion is 0.02857, or 2.86%.

Q. Two of the three Spokane River Projects are smaller than Project Compass was. Are these projects "abnormal" in size?

A. We may use Staff's definition of "major" plant from Staff's testimony in Avista's last rate case as one way to determine if these projects are "abnormal" in size. Staff recognizes here that this amounts to assuming that "abnormal" and "major" are synonymous, and that reasonable parties may disagree.

Nonetheless, by that standard these projects may be considered to be abnormal in size; see the testimony of Staff witness Joanna Huang for discussion on "major" projects.

Recall that Staff's method of calculating the size of the *pro forma* adjustment aims to capture only the known and measurable plant addition amount that is above and beyond what the historical trend suggests. This attenuates the risk of overstating the future rate base balance for the particular type of plant.

Q. How has Staff calculated the amount of plant addition above and beyond what the historical trend suggests?

A. The calculation is performed according to the following steps:

Step 1: The annual growth for a particular type of plant is found through regression analysis. Production plant was found to have grown by $15.809 million per year.

Step 2: The monthly growth is found by dividing the annual amount by 12.

Step 3: Find the actual amount of plant transferred to service, by month. Through UTC Staff Data Request No. 12, the actual amount of production plant transferred to service from the three Spokane River Projects is found.

Step 4: The actual transfers by month are compared to the estimated transfers per month. When the actual transfer exceeds the estimated transfer, the difference is appropriate to add as a *pro forma* adjustment. If the actual transfer does not exceed the expected transfer, no *pro forma* treatment is applied, as the historical trend is assumed to capture typical production plant growth.

Q. How do the *pro forma* adjustments to the attrition study models compare between Staff and Avista?

A. As shown in the table below, Staff's method for calculating this sort of adjustment produces a lower figure than the Company has testified to. This is due to the different methodology Staff used in calculating the size of such an adjustment. Another important factor is Staff's use of AMA (average of monthly averages) figures, which is consistent with the accounting used elsewhere in the attrition study. Again, note that Staff is not supporting a *pro forma* adjustment for the Company's AMI project, in either of its services.

Table 10– *Pro Forma* Adjustments to the Attrition Study – Plant in Service

	Spokane River Projects (Electric)	AMI (Electric)	AMI (Natural Gas)
Avista	$ 71,295	$ 26,304	$ 10,946
Staff	$ 17,461	$ -	$ -

Q. Staff has expressed some skepticism over *pro forma* adjustments to its statistically-based attrition study model. Why has it chosen to support one here for the hydro-electric production projects along the Spokane River?

A. To consider the appropriateness of such an adjustment, a look at the historical growth rates of production plant was warranted. The historical growth in production plant additions suggests $15.81 million in annual production plant growth. The historical trend also shows that Production plant has been the slowest growing part of Plant in Service (2.03% annual growth).

Post Falls, the smallest of the three projects, had $9.3 million of production plant placed into service in February 2016 alone, and by the end of February the entirety of the estimated $15.81 million in production plant growth had been exceeded by over 23% due to transfers to plant associated with all three projects. The substantial difference between the growth suggested by the historical record and what is actually known to have been placed into service bolsters the argument for the use of a *pro forma* adjustment to the attrition study model's production plant results.

E. Reasonableness of Results

Q. Is it important to review the attrition study's results for reasonableness?

A. Yes. The quantitative results provide a strong basis for an attrition adjustment. As noted above, the mathematics are convincing because the vast majority of the lines-of-best-fit explain over 90% of the variability in expenses and rate base. But even

though Staff completed its analysis in an objective manner, it is still important to assess whether or not that objectively-derived answer makes sense.

Q. Please provide a brief example of how Staff reviewed its attrition-based results.

A. We can compare the analysis done by Staff in Avista's last rate case to the results of the Company's 2015 CBR. On the electric side, Staff's projections of Net Plant were off by less than 1.4%. On the gas side, Staff's projections of Net Plant were off by less than 9.6%.[62] Staff's natural gas attrition analysis in this case is more conservative than last year's due to the use of both linear and polynomial lines of best fit.

Q. When will the Commission be able to assess the reasonableness of the results of a similar model to the one used in this case?

A. Once the Commission receives the Company's 2016 Commission Basis Report, it will have the results of the Company's operations under a year in which it was granted revenues based on an attrition adjustment. The model that produced that attrition adjustment is the predecessor of the model in this case. An appropriate comparison would include the projects from all parties' attrition study models and traditional, modified historical test year models. Such a comparison will provide further evidence of the reasonableness of the methodology used in the calculation of an attrition allowance.

[62] *See* UE-150204, CRM-2, column M, page 5 (after removing 2016 growth) *and* UE-160228, CSH-4, page 2, column A (Avista's 2015 AMA CBR) for electric. For gas, *see* UG-150205, CRM-3, column M, page 5 (after removing 2016 growth) *and* UG-160229, CSH-5, page 2, column A (Avista's 2015 AMA CBR).

Q. Does this conclude your testimony?

A. Yes.