Council Meeting
March 14 and 15, 2016
Portland, Oregon

Tuesday, March 14

Council Chair Henry Lorenzen called the meeting to order at 1:30 p.m. All Members were in attendance.

Reports from Fish and Wildlife, Power and Public Affairs committee chairs

Fish and Wildlife Committee

Committee Chair and Council Member Jennifer Anders reported on six items:

1. A bull trout presentation from the Fish and Wildlife Service looked at the biology and life history of bull trout. Their habitat overlaps with salmonids, but they have unique habitat and biological requirements. The Four Cs drive the species: "cold, clean, complex and connected water." The committee heard comments from states about the species' treatment as a single DPS (distinct population segment). Judy Neibauer, fish and wildlife biologist with the Fish and Wildlife Service, will take those comments back to her superiors to see what might be done.

2. Cost savings workgroup – Bonneville reported that through the mechanistic, cost-savings approach, it found a project ramping down that will provide $77,000 in cost savings. An RRS project in the Deschutes will generate $110,000 in savings for fiscal years 2018, 2019 and 2020. The group talked about questions they received on the sturgeon RFI. They received seven proposals: two would expand existing work, one would add a new work element to an existing Accord project, and four are for new work. The group needs to ask clarifying questions on some of the proposals before it comes back to the committee.

3. Thirteen comments were received on the research plan. Entities commented on the main document and the list of critical uncertainties. There were comments on tributary habitat and hatcheries. Some commented that resident fish are not to be neglected in this process. Another set of comments asked that the document provide a definition of

research, monitoring and evaluation. Many comments stressed the importance of research, but observed that we didn't synthesize the information gathered from research. Patty O'Toole will summarize the comments and get them to the Members in the coming weeks.

4. Update on the program's fish information/data products. Nancy Leonard shared a draft webpage that provides access to the Council's fish program activities. The committee will review the site and staff will continue to improve accessibility. It represents progress in the committee's public engagement efforts to help people understand what the Council does.

5. Water markets and flow restoration. The committee heard an overview of water markets
and transactions across the Western United States. Stream flow is limiting factor for fish in the Columbia River Basin. Water markets and transactions are an effective tool in addressing these limiting factors. The scale and extent of water markets has been growing across the West. The Columbia River Basin is a leader in advancing water market approaches, including the Council's water transactions program. This is economical way to move water from agricultural to municipal and conservation uses. It can be done without seriously affecting the agricultural economy.

6. Fish and Wildlife Division retreat. Tony Grover, Fish and Wildlife Division director, discussed the retreat that took place a couple of weeks ago. Themes included developing effective strategies, managing external relations, building teams and exhibiting effective leadership. Outcomes included looking at mid-program assessments for the Fish and Wildlife Program.

Power Committee

Power Committee Chair and Council Member Tom Karier reported that staff issued an RFP to complete a survey to help define the industrial sector's energy use, as well as the region's electric-efficiency and demand response potential. In 2016, research was conducted on 14 of the 20 segments and this RFP is to finish up the project.

A Washington State University study reviewed greenhouse gases from reservoirs. It concluded that most studies underestimate it. Different methods were to blame. It was interesting how much concern applies to Northwest reservoirs. Calculations shows that emissions from Northwest reservoirs are relatively low compared to power generation. Between 1–6 percent are from gas plant operations. Emissions from Northwest reservoirs are even lower because of low productivity of organic materials. It's not clear that changes would avoid small releases.

PGE's Franco Albee presented an overview of his utility's Integrated Resource Plan. PGE employs load forecasting and resource adequacy methodologies, and it is working to identify value for energy efficiency, demand response, renewables and thermal generation.

The Power Division staff presented a primer on energy markets in the Northwest and along the West Coast. It addressed energy imbalance markets (EIM), CAISO's expansion, and

some of the financial arrangements and mechanisms used in those power markets. Staff also gave an overview of the Regional Portfolio Model, which was developed by the Council. It looks at regional power system expansion, while accounting for future uncertainty.

There was the understanding that “all models are typically wrong, but some are more useful than others, and this one seems to be particularly typically useful,” Member Karier said.

Public Affairs Committee

Committee Chair and Council Member Jim Yost said the committee met last February 14. They reviewed new Council brochures to be displayed in kiosks and discussed social media advertising. Carol Winkel, staff senior writer and editor, explained that the Council is getting more hits on its website due to advertising. The committee decided to boost that. They discussed a photo library project so the Council would have that available to use on the website. The committee reviewed a draft of a public affairs plan. In addition, the committee discussed options for a congressional tour, as well as proposals for a full website review.

1. Presentation from Mike Colgrove, executive director, Energy Trust of Oregon

Colgrove explained what the ETO does, calling it one of the top performers in terms of achieving total megawatts, energy savings per load served, number of customers and penetration into new building sectors. It’s also innovative in assessing what can be done.

The ETO supports energy-efficiency and renewable-energy investments, and serves 1.5 million customers of PGE, Pacific Power, NW Natural, and Cascade Natural Gas in Oregon; and 70,000 customers of NW Natural in Washington. Just this year, the ETO started serving Avista’s Douglas County customers. The ETO is funded by a 3 percent public purpose charge for electric utility customers, and utility tariffs approved by the OPUC. It has an annual budget of $198 million, the majority of which is directed to electric efficiency. Colgrove assumed leadership last fall after Margie Harris retired.

Member Bradbury asked how Washington pays for its share of funding. Colgrove replied that ETO contracts with the state to deliver a certain target and it pays through the rate adjustment.

Colgrove talked about ETO’s annual electric savings, including the impact they’ve had in terms of savings in Oregon and Southwest Washington. 2016 was a record year, saving 60 aMW for the state of Oregon. Not only did ETO exceed is overall electric goals by about 109 percent, at a levelized cost of 2.6 cents per kWh, it also beat the individual goals for its utilities: PGE and Pacific Power. Overall savings for natural gas were 6.7 million therms, a savings of 117 percent of ETO’s goal.

Looking at renewables, in the early years, ETO was able to support utility-scale wind, which accounted for large investments in generation in 2003, 2007 and 2008. But since 2008, investment has been relegated to smaller-scale projects of less than 20 MW. ETO tends to support projects under 5 MW. In 2016, ETO exceeded solar goals by 25 percent, and ended the year strongly. Last year, it achieved 20.8 aMW of savings in clean energy generation — all solar, except for one hydro project. There is a strong pipeline of potential irrigation

modernization projects for 2018-19.

Looking back on 2016: ETO's successes were accomplished with a $160 million investment, and 59 percent went into direct investments to its customers. This was accomplished with no mega-projects. The 60 aMW in gas savings were achieved with regular and large projects.

ETO's portfolio of offerings for industrial, commercial, residential, and existing and new construction did well. It had a few underperforming tracks, but it made up for it with additional work in other tracks. It was a stellar year for LEDs: In the residential sector, over 80 percent of all the bulbs ETO incentivized were LEDs. In commercial and industrial sectors, streetlights accounted for 90 percent of lighting savings. The booming new construction markets also led to banner year. There was a more than 35 increase in new, energy-efficient homes, and a 38-percent market penetration rate. There is strong new commercial construction of multifamily buildings and data centers. ETO had a program targeting renters and moderate-income customers. There is an outreach of gas furnaces for rentals and moderate-income homes.

Two years into its five-year strategic plan. ETO is at 47 percent of its electric goal, 55 percent of its gas goal and 67 percent of its renewable energy goal. Colgrove said that they are confident of meeting the goals in its five-year strategic plan.

Colgrove has been at ETO only seven months after moving from New York. "It's important for me to get out across the state, and meet people in the communities," he said. He visited Pendleton, Hermiston and others. Since 2001, the Tamastslikt Cultural Institute has been making energy savings a priority. In 2014, it took steps to make its museum a net-zero energy facility.

Colgrove described how ETO and the Council work together. The Regional Technical Forum (RTF) serves as a sounding board for savings and analysis work. ETO provides RTF funding and serves as a member and on its policy committee. It relies on the RTF as a primary source for savings, costs, measure lives and load shapes. RTF coordinates and funds crucial research that ETO could not complete alone.

The Seventh Plan helps shape ETO's planning and direction. ETO takes 17 percent of the Council's Seventh Plan regional energy goal. Colgrove compared the potential by sector: overall, the ETO shows less potential than the Seventh Plan due to higher saturations of energy efficiency in its territory. Oregon tends to be more industrial than some other Northwest states. The region may have more electric space and water heat than among ETO's customers. Also, ETO only counts what it can influence, whereas the Council counts everything.

How ETO will approach recommendations in the Seventh Plan going forward?

- It budgets to support end-use load research through NEEA;
- Incorporates capacity value in estimates of savings;
- Conducts pilots, research and evaluation; and
- Takes a closer look at underserved markets.

Colgrove explained that Margie Harris kicked off a comprehensive diversity initiative in ETO. To continue to provide value, we need to understand communities we're both serving and also

underserving, he said. ETO is examining its baselines. “There’s an urban and rural split in markets within its existing homes program,” he said. “The general wisdom is that rural customers are underserved. But if we use Oregon as a benchmark, our existing homes program is serving rural customers to a greater degree.”

Challenges and opportunities – Those who follow the Oregon legislature know that there’s a high degree of interest in energy. ETO doesn’t lobby, but it does track bills that could impact their work. ETO also is a source of information. There are bills that would affect the public purpose charge in one way or another by adding electric vehicles or transportation electrification of an area.

ETO’s current five-year plan prioritizes emerging technologies. “We have a large number of pilots underway and starting next year,” Colgrove said. “What’s keeping us up at night is that we’re starting to rely heavily on the success in emerging technologies. We do see a drop-off potentially coming, so a reliance on emerging technologies is a way to backfill that pipeline. But right now, we’re not seeing anything to take the place of LEDs, aerators or low-flow devices.”

There’s uncertainty in short-term acquisitions and in long-term resource planning. Looking at a graph, he said there’s a common pattern in all the IRPs. The savings tend to go down, but the timing is different. You can see the impact of items such as LEDs and low-flow showerheads as they become standard.

Strategic initiatives and discussions underway include:

- Assessing ETO’s structure and readiness
- Budget review
- Diversity initiative
- Community and educational approaches
- Low income
- Utility demand response + energy efficiency
- Distribution system planning
- EVs

Member Lorenzen asked how ETO allocates resources between energy efficiency and renewable generation. It costs more to build renewables than does acquiring energy efficiency. Colgrove replied that it’s dictated by their authorizing legislation. A portion is earmarked for renewables. It’s a fixed budget.

Member Karier asked about demand response. “What’s your mission/legal obligation to pursue that?” he asked. Colgrove replied, “It’s a new area for us and a new area for the Northwest. We’re looking at that nexus between energy efficiency and demand response.” Legally, ETO doesn’t have a mandate to support or include the value of demand response, but it’s of value to utilities. “There are ways for us to coordinate with them,” he said. “As we’re delivering our efficient services, we might be able help utilities meet their demand response needs by providing matching efforts in that area. We have a great pilot with Pacific Power looking at its constrained areas, and we’re testing if we can see significant reductions.”

2. Briefing on Columbia River fish runs for 2016 and forecast for 2017

Lynne Palensky, staff program development manager, introduced a panel of fish experts to provide a look back and a look forward at fish returns in the Basin. Briefing the Council were Brian Burke, Northwest Fisheries Science Center, NOAA; Ron Roler, Washington Department of Fish and Wildlife; Tucker Jones, Oregon Department of Fish and Wildlife; and Paul Kline, Idaho Department of Fish and Game.

Burke began talking about Chinook and coho numbers, based on ocean conditions. “I’ll get the bad news out of the way,” he said. The forecast for salmon and steelhead returns to the Columbia Basin “aren’t looking very good” for 2017.

He discussed three main field samplings: Juvenile salmon sampling, funded by NOAA and BPA, Newport Line and Micronekton survey. He showed a stoplight chart showing different conditions for salmon survival in the oceans. In the last couple of years, seeing a lot of red, indicating poor conditions, he said. One exception is the ichthyoplankton, which could suggest a fair amount of food will be available for salmon. Anchovies are another food source.

Burke said that in the last couple of years, there have been poor conditions for ocean survival. Warmer-than-average temperatures in the ocean, called “the blob,” started in 2013 and lasted almost three years. It contributed to poor conditions for the copepods and krill that the fish eat.

Last March, El Niño helped degrade the blob, but the warm temperatures came back. Now the blob and El Niño are gone. While temperatures in the ocean are fairly normal right now, the impacts could be lasting, considering that salmon and steelhead spend one to five years in the ocean before returning to spawn. “There are often lags between the physics and biology,” Burke said. “The main point is that some of the responses are immediate and some are delayed. We may see changes from something that happened in the past. The ocean ecosystem has changed significantly, and is still changing.”

Burke concluded that expected returns in 2017 would be well below the 10-year mean. The caveat on 2018 forecasts is that our standard set of ocean indicators, which are sufficient in a stable regime, may not represent the complexity and variability in recent ocean dynamics.

Member Norman asked, “Relevant to ocean productivity indicators, is it a combination of all the indicators that relates to the forecast methodology or do some indicators have a stronger relationship with your forecasts?”

“Some do,” Burke replied. “The model I showed used a multivariate summary of all of them to use as a covariate in the forecasts. In other analysis, we select out some things that are important for certain groups. This is being used in lifecycle models. In that setting, we’re doing a more thorough job selecting certain types of covariates for particular stocks of Chinook.”

Member Lorenzen recalled reading a book about the blob. It didn't go away, it just went deeper and came back, he said. Burke agreed. “The diff between March 2016 and 2017 is that it came back,” he said. “It was very strong during the spring of 2016. The surface got mixed and cooled off, but down 150 meters it got warm. It takes a huge amount of energy to dissipate that heat. It’s possible the blob will come back, but for the most part it’s dissipated.”

Member Booth asked if Burke is aware that the blob may be caused by underwater volcanic activity. In 2015, there was a large eruption 300 miles off the coast of Oregon — when the blob first occurred, Member Booth said. Burke replied that one oceanographer he spoke with didn't think it was enough to influence the size and duration of the blob. There is agreement that the high-pressure ridge over the Gulf of Alaska during fall and winter of 2013 was anomalous. There doesn't seem to be a lack of plausibility to the argument that the cause was from this high-pressure ridge.

Tucker Jones discussed the status and location of sturgeon and eulachon. The further you get from the ocean, the less good things look, he said, in terms of size and productivity. Looking downstream from Bonneville, legal-sized white sturgeon abundance has increased and is similar to modeled projections. The adjusted adult abundance is slightly above the Oregon Conservation Plan status threshold for the first time since 2010. Productivity in the lower river isn't as good as we'd like to see it. Size structure in the lower river is starting to shift. You want a population dominated with juveniles. An increase in sea lion abundance is going to be problematic as well.

Columbia River Sturgeon below Bonneville Dam:

- 2016 forecast 147,000
- 2016 estimate 224,000
- 2017 Forecast: 238,000 (no harvest)

Sturgeon grows rapidly in the first year, up to about 12 inches. Then growth drops off rapidly. There was a big spike in 2009. Since, lower productivity is playing into our size structure, Jones said. We want juveniles to be 90 percent of our population, but it's at 65-70 percent. They're still relatively healthy, but the trend is not on in the right direction.

He discussed sea lion predation on white sturgeon at Bonneville Dam. Their presence has grown and a hazing program was initiated in 2005. Bonneville Dam is the best spawning area. If sturgeon aren't there, then there's a problem.

At Bonneville, we do see recruitment every year, but didn't have any in 2015–2016. Legal-sized abundance declined from around 14,000 in 2012 to about 6,000 in 2015. Adult population is about 1,000 fish right now, which isn't a positive sign.

At The Dalles Reservoir, we see relatively stable recruitment. We had a couple of years without any recruitment. Adult abundance has been stable. The heat event in 2015 will be talked about for a long time, Jones said.

At John Day Reservoir, we've seen 12 of 20 years with no detectable recruitment, including the last four consecutive years. There was a heat stress-related die-off.

Jones discussed sturgeon recruitment at the reservoirs in detail.

As stated earlier, the more you move upstream, things look less good, he said. Bonneville has largest population, then The Dalles and then John Day has been lowest. It's still 30,000 fish in John Day — a big pool by a lot of people's standards. Frasier River has 50,000 fish in its

entirety. Populations in the Snake River are 5,000. The Sacramento River has a decent number of fish in it.

McNary Reservoir has all red indicators. There were 10,000 estimated in 2011. About 40 percent were hatchery fish. Without hatchery fish, there were only about 5,700 in 2011.

Lower Snake River Reservoirs need attention to figure out what's going on there

Looking at eulachon, the Columbia River Smelt are prone to boom and bust. Numbers fell of a cliff in 2003, triggering NOAA fisheries to list them as threatened. There was a large return in 2014. It's too early to know where we're at in 2017, Jones said.

Ron Roler ran through his fish returns slides quickly. The 2017 species-specific predictions for fish arriving at the mouth of the Columbia River include:

- 160,400 upriver spring Chinook (above Bonneville Dam), compared to the actual return of 187,800 in 2016
- 63,100 summer Chinook, compared to 91,000 returning in 2016
- 198,000 sockeye, compared to 295,500 returning in 2016; this forecast includes 1,400 Snake River sockeye, an endangered species, compared to 944 returning in 2016; the Idaho Department of Fish and Game estimates 868 adult Snake River sockeye (hatchery plus wild) will cross Lower Granite Dam, the last dam the fish cross on their journey to spawn
- 130,700 upriver summer steelhead, compared to 182,736 returning in 2016
- 18,000 wild winter steelhead, compared to 22,379 returning in 2016
- 582,800 fall Chinook, compared to 641,900 returning in 2016
- 309,040 coho, compared to 196,342 returning in 2016
- Chum salmon: The managers do not forecast this run, but the 2016 run totaled about 40,000 fish, twice the 2015 return of about 20,000.

Paul Kline said he'd like to be the purveyor of better news, but things aren't looking any better in the Snake River. He discussed the numbers upstream of Lower Granite Dam into Eastern Washington and Oregon, and into the Clearwater and Salmon basins in Idaho.

Member Booth observed that the fish that make it to Idaho have already survived the harvest, which are set based on ESA take figures. He said that when you look at Idaho figures, keep in mind that they have made it through the fisheries, so it's a combination of all these factors, especially harvest levels set downstream. Kline replied that's correct: We're at the end of the line. Kline said they also are a party in negotiation with the *US v OR* agreement.

Member Bradbury asked, what is causing the decline in returns? Kline replied that during high-water years, there was good outmigration to the ocean. The fish moved into the buffet table of the ocean, and then it changed. The blob affects fish that come back earlier. "We have a good snowpack this year, no blob and I'm hoping things turn around," he said. "The

Idaho numbers are based on average catches, and it's our intention to change that from average to a better situation. We see there's a problem and will be looking to pass more fish up into lower Idaho. That will be our goal."

Member Karier said he remembers that the BiOp had AMIP (Adaptive Management Implementation Plan) have certain thresholds. Have any forecasts dropped below those thresholds? Kline replied that they have to go back and look at that, and see what those triggers are to see if they want to bring those up. It's on our radar, he said. Member Karier asked, would that impact harvest policy?

Kline replied he didn't know. He hasn't been in that situation before. Idaho produces 60 percent of the steelhead, so it's everyone's concern.

Member Karier continued, asking Burke about ocean indicators. "You calibrated by returns. I've seldom seen them by the fish. A good ocean year might take few fish in, but not return a spectacular amount back. Do you account for fish going in to the ocean versus what comes back?"

Burke said they generally look at adults coming back. The number of juveniles going out aren't that variable. Hatcheries are putting out the same number each year.

Roler said it varies if you have better outmigration. Burke said instream survival varies from 40-50 percent. Originally they did Bonneville Dam counts. Now they try to be more precise. "We started to use PIT tag data," Burke said. "We know exactly how many of those came back. The point is to look at survival versus abundance, and to do it on a stock-specific basis."

Member Yost said we haven't been transporting as many steelhead in the Snake River the last couple of years. They do well in the barges, he said. Instead we've been wasting by spilling water. Maybe not barging the steelhead is causing some of the problems with steelhead returns.

Kline declined to completely answer that. He said that in 2015, it was a low-discharge year, but it was a reasonably high spill year, and the lowest transportation year on record. Outmigration survival was normal to slightly better than normal. So that picture doesn't paint a disaster of itself. Regardless of outmigration, the ocean can trump that.

Council Member Guy Norman said, "The years from 1980 to 2000, I had the pleasure of trying to manage these runs. I look at the bright side the last 15-20 years. We do have a drop in 2017 that is out of control with the various interior measures due, to productivity shifts in the ocean. I think the picture painted here is reflected with spring Chinook and it represents that a lot of the measures being implemented in the Basin are successful — whether it's harvest management, hydro operations or habitat restoration. I just want to put that perspective out there. Not that we shouldn't be concerned – particularly with the steelhead. We have a lot of work to do, but the last 15-20 years don't look too bad."

3. Report on program hatchery assessments

Member Booth described a just-completed project to visit each of the 14 program hatchery sites, and to get an independent review. HDR Engineering visited 10, McMillen two, and BPA and Council staff visited two sites. The report is not quite done, but in May the Council will get detailed reports. They will be reviewed by staff and published on the Council's website. The goal was to evaluate the hatcheries under the current operating plan.

Mark Fritsch, staff project implementation manager, said the project is part of the Fish and Wildlife Division's strategic plan. It's the highest priority of their 2014 program.

Mark Hassebrock, HDR project manager, said they looked at 10 sites. Eight of them have a hatchery facility and two don't have a hatchery building; those fish come from other sources. Some have quite a few sites associated with them bringing the total number up to 32. They are located in Washington, Idaho and Oregon. Different facilities have different missions: adult trapping, adult holding and spawning, egg incubation, juvenile rearing, acclimation and release.

They reviewed the assessment process, including: reviewing existing information, facility data forms, site visits and drafting a summary report (facility mission and operations, specific maintenance issues, and tabulation of site elements, condition and projected costs).

Site visits vary. They generally try to follow the water through the facility. Some facilities are pretty spread out. Fritsch said they looked at mission-critical elements too.

Hassebrock said that generally, they found the facilities to be well kept — neat, clean and organized. Operators conveyed that they care about their mission. Obtaining enough water at the right temperature was a common issue. Many sites have surface water intakes. Another issue is keeping intake screens clear of debris and ice. Nine facilities rely on chillers to meet their temperature requirements. Backup power is another critical issue.

Member Karier asked if all these facilities have a backup generator. Fritsch replied that all sites have a backup except those using diesel motors. An issue is that despite testing protocol, it tells you it's working. They know if it breaks, they can't get parts to repair it.

Member Anders asked about water quantity and quality. "Is that equipment-related or is that something our dollars are going to fix? Hassebrock replied it's not a simple answer. In one case, at Umatilla, several wells aren't producing what they're designed to produce. It issue is probably related to the well itself, rather than equipment. It needs further investigation. Another they can pump, but it's not sustainable over long periods of time.

At Nez Perce, there's an issue with the chiller. The problem is the heat exchanger where water from the river flows through constricted passages. The chiller equipment itself is working fine. The Springfield hatchery chiller isn't delivering at the flow rate or temperature it's intended to.

Member Karier inquired if they are using interchangeable parts between the hatcheries, using standardized equipment. That is being done to a degree now, Hassebrock said. In some

cases, the age of the equipment makes that interchanging unworkable. They'll be looking to address these needs as they identify them.

Member Lorenzen remarked that it seems like you have facilities that are wearing out. Either you maintain them or shut them down.

4. Presentation by Independent Science Review Panel (ISRP) on Umbrella Project Review

Steve Schroder, ISRP chair, said that last month, he had the privilege of reviewing actions and activities of six umbrella projects in the Basin. These were examined using ISRP's blueprint for evaluation. He said that the first step is that if you're going to perform habitat restoration, landowners have to be involved and on your side. That means creating actions that everyone is willing to pursue. It's Zen-like — everything is connected. To do something at the reach scale, you need to understand the topography.

Strategic ecological approach: If we can remove obstacles, we can create restoration. If you want success, you need a lot of disciplines — people who can bring a lot of skills to the table and lead to effective restoration. Finally, you need to use the opportunities given to do things more appropriately. You have to assess what the problems are, then develop quantitative objectives — time sensitive objectives — and implement, monitor the implications of alterations to the habitat. And, if they don't work, you change things. You have adaptive management set up in a formal fashion.

These umbrella projects are an opportunity to execute habitat restoration in the Basin. They're affecting projects across a large geographic region.

The umbrella projects are:

1. Columbia River Estuary Habitat Restoration
2. Willamette Bi-Op Habitat Restoration
3. John Day Habitat Flow and Habitat Enhancement
4. Tucannon River Programmatic Habitat
5. Grand Ronde Model Watershed
6. Upper Columbia Programmatic Habitat

Schroder said these groups are doing an excellent job of networking with their communities. Schroder discussed different public outreach education and activities.

Looking at the objectives of the programs, many didn't have QUANTITATIVE objectives in their summary reviews. However, some, such as the Tucannon, Willamette and Estuary projects did. Some didn't have time limits on when the projects would be fulfilled, which were a slight weakness.

He described the quantitative objectives at Tucannon, where less than 30 percent of the river would be unnaturally confined.

Project selection processes were discussed. All used effective processes. Factors not often

considered are the effects of contaminants (there are a lot of contaminants in the Basin), human development, climate change, invasive species, density dependence and hatchery practices. It becomes a complicated process to figure out where to do work that will last a long period of time.

Horsetail Creek and Oxbow Dredge Mining Restoration projects were discussed. The Warm Springs tribe spent five years restoring the channel. Schroder mentioned culvert replacement projects below Bonneville Dam, where there was levee breaching.

Adaptive management project monitoring was discussed. Some groups had challenges. Even with frequent monitoring, information doesn't suit them in terms of assessing what their overall project is doing. Summing up cumulative effects on changes in habitat and fish numbers is something that has to be done in the future.

Member Karier asked what it means to be infrequently monitored.

Schroder said, "The monitoring objectives of ISEMP and others may be specifically directed toward things that are not directly linked to these small restoration actions. Even though monitoring is taking place in these sites, the data collected might not be germane to looking at how effective these restoration projects are. It may not be occurring as regularly as these folks would like. One of the big challenges these umbrella projects face is if they don't have the resources for monitoring, and if we're going to use adaptive management to help us learn and modify our projects, how are we going create the environment so they do get the necessary resources and to get the folks to help them make that monitoring available to them?"

Member Karier said, "I don't want to be in a position to defend ISEMP and CHaMP, but we may not need to monitor every one of those projects. If we are extracting data and using it regionally, that may be good enough." Schroder agreed.

Schroder summarized what was accomplished over the last two years: there were 87 restoration projects with 9,000 acres of habitat restored, 130 miles of river restored, and 45 miles of habitat were opened up. It's an impressive list, he said.

These umbrella projects have made significant progress toward using a comprehensive landscape approach for habitat restoration. They've accomplished habitat restoration actions, have an effective public engagement program, have well-defined processes for project selection and solicitation prioritization, and many provide important services to their partners, such as oversight, design administration, planning, technical assistance, funding and developing robust, cross-organizational teams that work well with federal, state and tribal governments to get things done.

They could improve working with U.S. Forest Service. The Forest Service has some pivotal holdings in this Basin. If we can foster better collaboration between these umbrella projects and the forest service it would be good for the program, Schroder said.

Places where further work is needed:

- Qualitative objectives with explicit timelines,
- Develop formal adaptive management processes.

- Monitoring plans need to be more maturely developed.
- Efforts to link project actions with overall trends in habitat and fish abundance.
- Explicit consideration of upslope conditions and processes.
- Sharing of lessons learned.

Schroder wants to hold a multiday workshop to resolve practical issues. It should include umbrella project participants, ISRP, Council staff, and other habitat and monitoring practitioners.

Member Lorenzen asked about working with the Forest Service: Is that a lack of funding? No, it's about opening communication channels, Schroder said. "We just need to engage them. Researchers are eager to talk about their work. Plus, 50 percent of the land is on Forest Service land."

Member Bradbury asked if we are continuing to do additional umbrella projects? Are we seeking other proposals? Grover said that some efforts have been around a long time. Others on the Upper Columbia River are coming together as a watershed planning exercise. Then there's the sub-basin planning group. They form and have deep roots. The accords spawned these. It provided the assurance of long-term funding, such as the John Day. Now we're facing the end of the accords. If they end, there are certainly some things worth preserving. We are in active discussions, in the Fish and Wildlife Committee to keep those things going and maybe find more. Member Bradbury said he liked getting that done.

Member Anders asked Schroder, "Do you think the umbrella projects are a good model for habitat restoration in our Basin? If so, why aren't there more? Schroder replied that it's interesting to see how the ISRB views how restoration should take place. ISRB has been informed by what umbrella projects are doing and vice versa. They are a wonderful way to have a coordinated effort across a large geographic space. It's nice to have a focused group that can interact and branch out with the Forest Service and Bureau of Reclamation. It focuses efforts. Umbrella projects are an excellent way to do it. There also are tribal and governmental agencies involved in restoration.

Stan Gregory, emeritus professor of fisheries at Oregon State University, said that all the projects showed progress in project prioritization, selection and teams. There's a lot of maturity. A place to advance in the near term is to evaluate their progress in implementing projects on a landscape scale and evaluate their outcomes.

Schroder said they didn't look at other groups with multiple projects going on. They didn't take a hard look at those differences. It does look like they formed around where they were needed.

Member Yost said he agreed with the local folks who know what they need to do, and put things together to get it done. There are lots of examples in Idaho. "I appreciate you coming by and letting us know we need more monitoring and evaluations," he said.

Dave Heller, ISRP member, said that what they're looking for is more quantitative measures. "Did we do what we said we were going to do? Without that, we're operating on 'it looks or feels good.' It's not a bunch more money, but it's a much better structure. How do you want to

quantify it? What's the outcome and the timeframe?"

Member Karier said those goals are just good management. "We've tried many ways to do this. One of our most expensive ways was ISEMP and CHaMP — $50-$60 million to evaluate those kinds of actions."

5. Briefing on CHaMP, ISEMP and AEM schedule

Leslie Bach, staff senior manager, said that for the program's tributary habitat effectiveness monitoring, Council Members requested staff to develop a schedule for reviewing and recommending actions.

The scheduled process should:

- Engage fish and wildlife managers;
- Identify products to carry-forward from ISEMP, CHaMP and AEM projects; and
- Clarify needs to inform program tributary habitat monitoring.

They need to determine what is needed to answer questions about tributary and habitat monitoring. Bach said that some actions "work" but we don't need to continue to monitor them. They need to identify and codify those, and need to document effects on limiting factors. One project will be to put those into a framework.

Bach said they set up a logic path, which dictates how to identify habitat-limiting factors and the benefits of some of these actions. We don't need to monitor every action, but we're after the cumulative effect of these actions.

The schedule going forward is that March through April, Council staff will hold technical meetings with program managers, NOAA and BPA to discuss the programs. In April, staff will develop a draft Tributary Habitat Monitoring Framework. In June, there will be a Fish and Wildlife Committee discussion on staff recommendations, before going before the full Council in July. Then efforts will be made to integrate the Council's Framework with BPA and NOAA's tributary monitoring process and products.

Member Karier said, "I'm getting worn down. I'm encouraged that staff is looking at this and has a timeline, but we're in an unusual position because we can't cut funding because nobody will tell us what's useful. These projects cost $75,000 a month. The onus is on the sponsors to tell us what to preserve. If they can't, maybe it's not worth preserving. It shouldn't take this many months."

Member Karier continued, "I want to see us do it quicker and not get confused. Our job is to make sure it's on track. Can't we give them 30 or 60 days? I like the inventory on what we need to know and don't know. I'm dubious on taking a lot more time."

Member Booth agreed with Karier and said, "You've put good work into this. It's time to circle back to the managers. There's not agreement among them. If we can meet this schedule, we can still make decisions for 2018." He asked for a one-pager on what has been learned from

CHaMP that's valuable. "All this money that has been spent … what do we have that's of value today?" he asked. "Put that in the list somewhere."

Member Yost said that after hearing Members Karier and Booth, he thought of vultures saying, "Let's go kill something."

Member Anders said she appreciates the efforts to come up with a diplomatic process to handle a difficult situation. "This isn't a snap decision, this will be a guiding effort," she said. She also said she appreciates Member Karier's persistence.

Member Norman said, "I'm going to state the obvious. The primary purpose is to inform future investments in habitat restoration and fish benefits. What struck me is the degree of certainty that's acceptable for determining fish benefits." He wondered if that will be a focus topic in coordination with the managers. The degree of certainty is debatable, but it's directly connected to the amount of investment and monitoring that's needed to make those informed decisions.

"We rely on the guidance of the 2014 program, but we might not need the same degree of certainty of scientists," Bach said.

Member Lorenzen said that what we've done here today is helpful, and he'd like to see a check-in every three months to keep this on the front burner.

Member Bradbury said that looking at the draft schedule, on July 11 and 12, "you have us looking at what you worked up," he said. "I don't understand why it goes to 2018. Is that the process of working with outside players?" Nancy Leonard, fish, wildlife and ecosystem monitoring and evaluation manager, replied that they'll be armed with a Council-approved position by July. Then they'll build up the new BiOp for 2018. That's the timeline they're on.

Member Karier said the other advice is to look to the managers for recommendations. They key is to look at how it will affect fish and wildlife with reasonable assurance. We need to understand why and to what degree we can afford it.

The meeting was adjourned for the day at 5:09 p.m.

Wednesday, March 15

Council Chair Lorenzen called the meeting to order at 9:01 a.m.

6. Update on Northwest Energy Efficiency Alliance's (NEEA) programs and accomplishments

Jeff Harris, NEEA's chief transformation officer, described what NEEA is. NEEA represents 140 utilities and 13 million customers. NEEA's work includes scanning for emerging technologies, assessing opportunities for market leverage, conduction research and product testing, and operating a limited set of savings initiatives. It also works on codes and standards.

Since its creation in 1996, NEEA has delivered over 1,409 aMW of cost- effective energy efficiency through market transformation. About one quarter of utility and Bonneville savings reported over the 2010-2015 cycle were delivered through NEEA initiatives. The cost of savings from NEEA programs has been very low — about 2.8 cents per kWh.

NEEA is in its fifth cycle of funding. It starts with new, little bits of savings and accrues to big savings over time. The real savings show up downstream.

Harris said that NEEA works through market transformation. “If we can remove barriers to those forces, we are able to help the market work better to deliver the efficiency resource at a very low cost.” Harris said NEEA had a good last year.

NEEA also acts as a regional convener. Research and evaluation is a key input into the power-planning process.

Harris reeled off some of Council’s Seventh Action Plan items assigned to NEEA, which are included in NEEA’s 2015-2019 Business Plan:

- REG-10 Regional Market Strategies coordination
- MCS-4 Regional work plan for ET
- REG-7 Stock Assessments
- MCS-7 Monitor and track Code Compliance
- REG-8 Codes and load forecasting for Goals

Not included (contingent on additional interest/resources):

- MCS-6 Best practice guides for new industries
- REG-1 End-use Load Shapes
- RES-5 Support Regional MT for Demand Response
- ANLYS-9 Research on EE in water and wastewater

Harris referred to Mike Colgrove’s presentation the prior day, when he said that the ETO is concerned that the pipeline for new energy technology is at risk of drying up. Harris said that in 2016, NEEA looked at 12 things to determine if they could be future energy-efficiency opportunities. The year before that, there were at least another 12 and so on. “Of those 12, we took three, and now they’re market transformation programs we’ll be working on in 2017,” Harris said.

Three examples of 2016 technologies:

1. Heat pump water heaters – it has 96 percent of the market covered.

2. Ductless heat pump sales are up. NEEA helped the market achieve 14 percent over 2015.

3. Low-watt lamps are gaining market share. NEEA is trying to get the market to flip on less efficient to more efficient. They’re seeing good strides in those areas.

Codes and Standards – NEEA trained over 4,000 building officials to be ready for new codes when they took effect. It held training in all four states. It collaborated with all four to influence IECC and state energy codes, and to improve code implementation across the region. Are they ending up in buildings? Do builders know how to use them? We have a great record in the Northwest, Harris said.

Member Bradbury asked for clarification on 4,000 building officials. Harris replied that NEEA holds training events when a new code comes out. There is training for contractors, home designers and engineers. In Montana, air sealing continues to be a challenge for builders.

One of our roles supporting these efforts is as a regional convener, Harris explained. We represent four states and we can pull together a diverse group. An example is commercial, industrial and consumer lighting products. The point of regional market strategies is to get all those running in one place. NEEA has what it does, but utilities have their programs. State and local programs might be in play as well. Harris said that NEEA hasn't been as coordinated as it could be, but he said he's proud to say they have a plan around these markets and are beginning to implement them.

Emerging technologies – there's never enough money to do this work. If we can pool our resources we will have a much bigger impact, Harris said. He mentioned their involvement in the Northwest Energy Efficiency Leadership Forum 2016, which is co-chaired by Member Karier, BPA's Administrator Elliot Mainzer and PacifiCorp President Stefan Bird.

Market research – NEEA has a large stock of assessment projects. It does market research, surveys, and did some specific work on dryers and heat pump water heaters. Last, NEEA does data collection in support of RTF projects. Many times, the RTF is challenged to find critical data on which to make its technical decisions. Last year provided data for new homes, pumping systems for commercial and industrial environments, and smart lighting products that are now embedded in RTF protocols and energy unit savings.

Last year, it launched NXT Level training for commercial lighting trade allies.

NEEA has SEM Online – a web tool for small to medium industrial and commercial customers. Helps engage smaller customers for a low cost.

Also, NEEA has online marketing tools for ductless heat pumps and heat pump water heaters.

Reviewing its accomplishments, NEEA checked off most of the tasks given to them in the Seventh Plan. Last year, NEEA spent a lot of time on end use load shapes. It's been a need for 20 years now. They are still using data from the late 1980s, so we've needed this for a long time, Harris said.

NEEA has had some meetings with the Council's power-planning team to take what we know and put it into the forecasting process. Historically, many utilities haven't looked at changing codes and standards for their load forecasts. It's been pretty regular every three years or so. That way, they won't overbuild for something that will be addressed by a standard in the future.

NEEA is developing a regional transformation program for demand response.

Where NEEA didn't make much progress was model conservation standards, or best practice guides for new industries, such as cannabis growing.

NEEA is embarking on strategic planning for 2020-2025. It will draft a strategic plan for Council comment in Fall 2017. It's an open process.

By 2024, it aims to add another 1,000 MW of energy efficiency through the markets they're working on.

Member Karier said, "NEEA isn't a household name, but it's represented in everyone's household." When energy-efficient light bulbs were introduced, he said, "the first ones weren't very good. NEEA worked with manufacturers to improve them and made sure they were available at Home Depots. The same with front-loading clothes washers. HDTVs are another huge win for NEEA, and someday it will be the same for water heaters."

Member Anders asked a question about Montana compliance. "The way I understood it is states receive American recovery funds and the report from Montana is that we were halfway there," she said. "Codes have changed since. How do other states compare to Montana's status? Harris replied that he'll get back to her with information.

Melinda Eden, NEEA, she'll provide Charlie Grist, staff conservation resources manager, the slide on annual savings, and conduit slides for strategic planning.

Grist said that NEEA got its start in the 1990s. It is a voluntarily funded organization and is up for refunding. He's hoping we can engage the Council in crafting NEEA's strategic plan.

7. Presentation by Pacific Northwest Utilities Conference Committee on the Northwest Regional Forecast

Shauna McReynolds, PNUCC executive director; and Tomás Morrissey, PNUCC senior policy analyst, briefed Council Members on their annual forecast of Northwest loads.

Member Lorenzen asked, "The question is, did the Council miss the mark or are we consistent with your forecast?"

Before answering, McReynolds summarized PNUCC's role for newer Council Members Baker and Norman. PNUCC is a trade association of electric utilities. Its membership is public and investor-owned utilities. PNUCC used to have an industrial arm, but it no longer has that representation since aluminum plants pulled out.

McReynolds said PNUCC has been doing the Northwest Regional Forecast since 1952. The organization stated in 1947. McReynolds was hired in 1982 and has been through every Power Plan. She wants to see how the utility forecasts compare to the Council's.

"The value of this product is it's 65 years of consistent information," she said. "It's one yardstick. It's a good indicator on where the utilities are focused." The analysis is based on:

- Normal weather loads
- Low water conditions for hydropower
- Expected operations for generation
- Long-term contracts only
- Utility forecasts of energy savings

She said the Regional Forecast loads vary significantly by utility. “It is a specific load picture in that it looks at utilities’ firm resources, not what they’d buy in the market. It also doesn’t include the independent power producers,” she said. PNUCC reports out an annual energy load resource picture, and a winter and summer peak picture. In the peak piece, there’s an assumption about the planning margin. We pad it because of uncertainties going forward, she said.

The report revealed that loads have slipped slightly and that there could be a winter deficit of 3,200 MW by 2021. The timing coincides with the closure of the Boardman coal-fired generating plant.

“We don’t have an expectation that there needs to be a build of 3,200 MW to get back to an adequate system,” added Morrissey. “As far as demand side resources, we see utilities continuing to be aggressive in energy-efficiency acquisition, and demand response will continue to look similar to last year.”

With the coal units retiring starting in 2020, we see utilities looking at how to fill that, he said.

Member Lorenzen asked if that includes Boardman and Centralia. Morrissey replied that it takes into account the loss of Boardman, but not Centralia since they don’t look at independent power producers. After 2022, Colstrip’s closures get counted in the report.

Morrissey reviewed load forecasts. Loads over the past five years haven’t materialized as predicted by utilities. That’s because of aggressive energy efficiency, and some loss of industrial load as the DSIs such as Alcoa have left the region. Alcoa isn’t starting up again.

Looking at 20 different utility forecasts, some are losing load, and a couple are forecasting robust load growth — these are smaller utilities anticipating a large load such as a data center. Also, there are few, firmly committed resources on the horizon, in part due to regulatory/energy climate uncertainty

Peak forecasts have slipped too — mostly due to DSI load expectations. Not all four states peak during the same hour.

Utilities less than 1,000 MWs have a forecast for large load growth, such as a large industrial customer in the next five years. One is PNGC Power, which has Umatilla Electric. It is forecasting some large loads in the next five years.

Energy efficiency is adding up, Morrissey said. We collect the data from utilities. We get asked how it compares to the Council’s. It’s doesn’t compare because our data looks at utility programs only. It doesn’t look at standards, NEEA and momentum savings. Utilities are predicted to acquire high levels of energy efficiency, since they did so well in the Sixth Plan.

Looking at demand response, it's similar to last year. The region as a whole has a lot of summer demand response, mostly from Idaho Power. For winter, current demand response expectations are muted. It's largely from two IOU programs at Puget and PGE. The drop is due to a couple of expiring pilots. Utilities are showing the need for capacity, especially as coal retires, and demand response is a resource that can be acquired quickly. So I wouldn't be surprised if these demand response forecasts increase, Morrissey said.

Member Bradbury said, "As we develop the seventh plan, we put a major reliance on demand response. We were aware it was a new concept in the Northwest. Are the utilities resistant to demand response or are they working toward getting it implemented?" Morrissey said it's a bit more of the latter. The Seventh Plan came out a year ago, and demand response can come online rather quickly. By 2021, we'll probably see more demand response than reflected on in the report.

McReynolds said she believes demand response is a serious consideration in the IRP processes, and there is discussions about the barriers to making that happen. Ben Kujala, Power Division director, said the Council put "at least 600" into the plan, and this is roughly in that neighborhood. The Seventh Plan relies on more in certain scenarios. But it could be very responsive to current conditions. If we end up in a bad water year, demand response programs might take off faster.

Member Lorenzen said the structure of the utility is another barrier. PacifiCorp has its generation all the way down to a direct relationship with its customers. With consumer-owned, where BPA is the wholesale supplier, it might want demand response, but it doesn't have the direction relationship with the customer.

McReynolds said that could be an issue. You might have a utility with a program in one place, but the demand response is needed in another place. Another thing to note is in some experiences, after customers sign up for it, they don't like it. It's about getting all the incentives aligned with the customers' desires. In the old days, we had big aluminum and the top quartile in demand response. But that's gone. It's about finding the right customer.

Member Lorenzen asked, "Are you finding the consumer utilities embracing the idea of going after demand response? Some, such as Seattle City Light doesn't need it, McReynolds said. They have the energy efficiency instead.

Member Booth asked how much new demand response from 2016 to five years out are you talking about? Morrissey replied the summer program of 400 already exists, so it's about 100.

McReynolds stressed that it's important to remember that hydro continues to be an incredibly valuable, carbon-free resource. "We did a *The Value of Hydropower to the Northwest Grid* paper recently, and there's a lot of water out there," McReynolds said. "On the ground, we have utility-owned 5,200 MW of hardware. That's all carbon-free resources. With normal weather, low-water conditions, it becomes 70 percent for winter peak. For energy it's 65 percent. In a high-water system, we could be back to 75 percent in a heartbeat." She added that another benefit is the growing role natural gas will continue to play, particularly as the coal goes away.

For solar and wind performance, we collect the data from the utilities, McReynolds said. We don't assume one number for all wind. Puget has higher-capacity factor wind, and that's reported. Utilities acquired some committed resources and that is included in the report. PGE's Carty gas plant is included. The upcoming solar resources are mostly PURPA, but not much else is in the pipe.

McReynolds said it's a sleepy time for getting resources built. Solar PURPA has bounced up and down. It can get online fast. The same with demand response. If you take all the loads mentioned, knowing energy efficiency, demand response, and loads, exports and planning reserves, you see that winter peak is the biggest issue. A normal-weather winter peak resource stack falls short.

Morrissey said they focus on 2020-2021 in this report, mostly because Boardman is retiring at the end of 2020. We're not the only ones looking at this, he said. A lot of IRPs are looking at what to do. A look at the Council's adequacy assessment shows it as well. It will be an interesting and pivotal year for the Northwest power system.

Member Lorenzen asked, "When you're determining the deficit, are you doing this is a deterministic way?" McReynolds replied, "Yes, absolutely. Each utility is doing that and we're bringing together their bottom line."

The summer peak picture looks more comfortable, she said. The lights aren't going out in 2020-2021 unless we have low water and other things line up.

However, looking ahead, the road is foggy, McReynolds said. Regulatory uncertainty adds to the fog. Another risk is policy. Where's that going? What are states doing versus the federal government? There's so much going on. Utilities are trying to act in that environment. Cost is also a concern. What does it mean for customers? If they have flat growth and have to build renewables to meet RPS, it's another issue. We're looking at individual IRPs.

Member Karier asked, looking ahead at BPA's investment, will that increase the capacity of hydro? Is that included in this? McReynolds replied that it would be when it's planned. They main hydro data comes from the Army Corps of Engineers. "It's not there yet," she said. "If it's an increase in generation, it will be reported in. We've had hydro efficiency in the past and what we have now is from the mid-Columbias, such as the upgrades at Grant."

Morrissey added that it's a dynamic table. It will react to what's being built in the region.

Member Norman said that with a 3,200 MW deficit projected for a winter peak, would it be correct to interpret a deficit on that line for earlier years such as 2020 of about 2,000 MW? Yes, that's a correct interpretation, Morrissey said, but we have a cushion, we hope.

Kujala said this is another good viewpoint. It takes different data and a different approach, and it's very consistent to what we're seeing. There are two flags around the same year. We hope we have a great water year. Load growth and projects might be a little different, but they're in the same direction.

John Fazio, staff senior power systems analyst, said that PNUCC has done outstanding work, but its slide on need is based on critical hydro and normal weather. They don't count imports or IPPS, and so do we need to acquire or build 3,200 mw in 2021? No. You'll see the 2022 assessment for adequacy next month. This is a consistent picture. They're looking at one point. The adequacy assessment will look at other variations. Half the time, the loads in 2021 will be greater than normal loads. Even though you have spot market to rely on, it's hard to know where to draw the line. That's where the Council comes up with the 5 percent loss-of-load probability.

8. Briefing on federal hydro-capital investments

Bonneville representatives appeared before the Council to discuss its strategy for capital investments for the federal hydro system and to provide specific details on a proposed $500 million capital investment at Grand Coulee.

BPA's new asset manager, Bill Leady, provided an overview of applying an asset management approach across the Agency. We're reinvigorating asset management at BPA, he said. The overall goal is to coordinate those activities across the entire organization. One outcome is rather than making just wise investment decisions, we'll look at portfolios of decisions.

On the transmission side, there is a lot going on. BPA has an asset management program delivery (AMPD), which is taking the maintenance program and ensuring that it's done in the most efficient way possible. They're also looking at risk: how do we know what's the most imp work to do within budget constraints?

Looking at federal hydropower capital asset planning, Leady said they know the condition of their equipment. They have failure curves and know the economic data. Grand Coulee is more important than smaller dams due to its economic impact. BPA used C55 from Copperleaf, which is an asset decision model used to build a value framework. It scores the projects on values. They get a printout and apply common sense to the equation. Some projects have court orders associated with them. They are taking a long-term look at where BPA should make its investments.

The Draft 2017 FCRPS asset plan was discussed. It shows where our projects are going to be, Leady said. There is Grand Coulee, McNary and 29 other plants. However, the risk and the benefits are largely at the first two. Leady said BPA is putting the money where it has the highest return on the system. There are safety and compliance issues as well.

McNary and Grand Coulee form the backbone of BPA's System Asset Plan in the 2020s, making up about half of the existing projects. Also, a chart showing a drop-off in 2025 is not a real drop-off. We just haven't looked out that far to prioritize them, Leady said. It's an analytical way of managing our investments.

The presentation focused to needed work at Grand Coulee Dam, which Leady called "the moneymaker" for the Federal Columbia River Power System. Jim Alders, BPA's project representative to the Bureau of Reclamation, ran through a list of Grand Coulee investments with the Council:

- G1-G18 runner replacement was finished in 2010.
- G1-G18 generator modernization is planned for FY17-18 and will go to bid very soon.
- G22-G24 is an ongoing, entire generator overhaul. It's about halfway complete. Known as the third powerhouse, it totals 2,500 MW, so it's an important investment.
- G19-G21 is an overhaul with a bid solicitation likely in FY18. There is a possibility to add about 240 MW, but the jury is still out if that's viable. The cost would probably be in the neighborhood of $100-200 million.
- Keys Pumping Station improvements.

Member Lorenzen wanted to know if there was consideration being made between just preserving the existing capabilities, and upgrading at additional cost. Leady said teams of people are examining the decision, including alternatives and the market. It's a collaborative process between BPA and the Bureau of Reclamation. The decision to put out a bid should be made this summer or fall, said Alders.

Member Lorenzen said that as a planning organization, the Council wants to be updated.

Alders talked about the switchyard breakers and fault lines. In the next year or two, they'll have that taken care of.

Member Karier asked about the Keys Pumping Station improvements. He said there was talk about upgrading it to a more-flexible storage operation. Has that decision been made? Chris Allen, BPA's hydropower program manager, replied a couple of years ago, it was decided that it didn't cost-justify fully upgrading its capabilities. The work being done on it is to maintain its current capabilities.

Member Yost asked how they figure the production of energy during that time? Are we talking about a year or year and a half? Alders said that G1-18, probably wouldn't take more than a year, the G19 – G21 overhauls would be in excess of two years per unit. Each of the units will be taken out in sequential order. There's also ongoing maintenance taking place at other units as well, which could affect how many units are out at one time.

Leady said that's one of the reasons for the long schedules. They look at outages systemwide.

Member Yost asked how many megawatts are we not going to have when you're taking units off line for planning purposes? They will follow up and will provide that. Kujala said there are standard outages in our adequacy planning.

Member Yost asked, when you do your prioritization, how do you budget for that? Is it an annual budget or compete with other funds within the budget cycle? Do you start at the top; do you draw a line? Leady replied discussing the asset strategy: what is the optimal work to do and what is the cost? For example, looking at a dam that went into service 40 years ago, the strategy would say to replace those turbines in 45 years. But you can't replace them in one year, has to be done over 7-8 years. The plan starts with budget constraints. We optimize around the budget constraints. That's the current process on spending $250 million or $275 million.

9. Presentation by the Bonneville Power Administration on cold weather operations

BPA's Peter Cosgwell introduced the panel, saying it's been an interesting winter across the service territory. Salah Kitali, internal operations manager; and John Lahti, construction and maintenance service manager, shared how BPA prepares for cold weather operations.

Kitali said that BPA doesn't have distribution, just transmission. Its transmission system passes through some high-altitude areas. Sometimes it's difficult to access some of the sites. Generation is on the east side of the system and load is on the west side. Especially in the winter, those paths can be congested. When we do winter preparedness, Kitali said, we review what challenges we had the prior winter. We do systems studies in the summer and winter, which contain engineering information on what the system can handle. We coordinate with the hydro desk to know what generators will be online.

This is important because the generators help keep the system stable. Also, there are maintenance checks of transmission, which seems to increase as the system ages. Also, certain equipment gets more stress. Dispatcher Standing Orders (DSOs) are regularly reviewed and updated; and communication protocols are reviewed for notifications during cold-weather events.

BPA works in close collaboration with the generators within the Balancing Authority footprint to ensure reliability of the system.

Lahti said BPA's transmission system is built to function in extreme conditions, but there are maintenance checks of the system, which seem to increase as the system ages. They still experience failures, such as freezing valves, ice loading, system hardening, etc. Depending on the incident, they might form an incident management team, but those are infrequent. BPA does have mutual assistance agreements in place if necessary.

Member Lorenzen asked about an outage at the Columbia Generating Station. Kitali replied there's an active investigation going on. There is one area where we had equipment where the valves may have frozen up. We'll learn from that and do some system hardening.

Member Yost asked how one hardens the system.

Lahti replied that by working with design organization to put a heavier-duty structure in a given location. In Montana, they have an interphase spacer in high-wind areas, for example.

Member Lorenzen asked about an older transmission line that goes up the Columbia River Gorge. Does it still create challenges for maintenance?

"We have lots of structures that are walk to or fly in structures," Lahti replied. "I'd like to say it's in good shape but I don't know."

Council Business

Northwest Power and Conservation Council Motion to Approve the Minutes of the January 10-11, 2017, and the February 14-15, 2017 Council Meetings

Member Booth moved that the Council approve for the signature of the Vice-Chair the minutes of the January 10-11, 2017 Council Meeting held in Portland, Oregon.

And

That the Council approve for the signature of the Vice-Chair the minutes of the February 14-15, 2017 Council Meeting held in Portland, Oregon.

Member Anders second. Minutes were approved without objection.

Northwest Power and Conservation Council Motion to Authorize the Staff to Enter into a Contract with PSR for Generation Evaluation System Model Software Development

Member Booth moved that the Council authorize staff to enter into a contract with PSR to redevelop the Generation Evaluation System (GENESYS) model software for an amount not to exceed $432,000.

Kujala told Council Members that three vendors responded. They are seeking approval of PSR to begin that negotiation.

Karier second. Voice vote carried unanimously.

There was no public comment.

Council Chair Lorenzen adjourned the meeting at 11:32 a.m.

Approved:

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Vice Chair