SEAPA Board of Directors Meeting
Wrangell, Alaska 2-11-16

Director of Special Projects Report

Load Forecasting-Capacity and Energy

Capacity

3,000 kW
Kilowatts- 1000 Watts

3 kW

Energy
How long the generators run
Literally kw X hrs.

kW-hours or kWh

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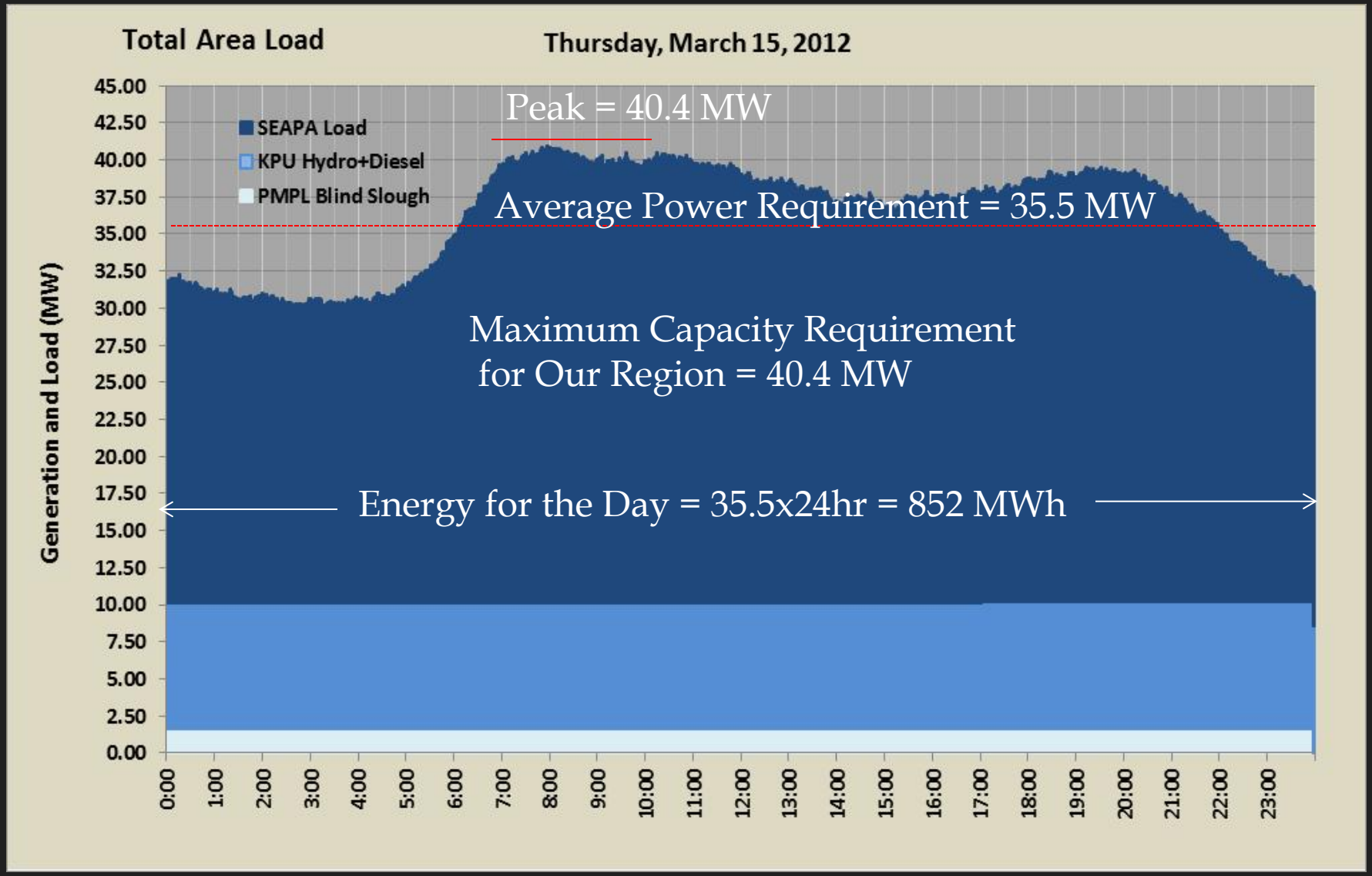
Load Forecasting-Capacity and Energy



This is total load + distribution losses plus transmission and SEAPA plant consumption

Load Forecasting-Capacity and Energy

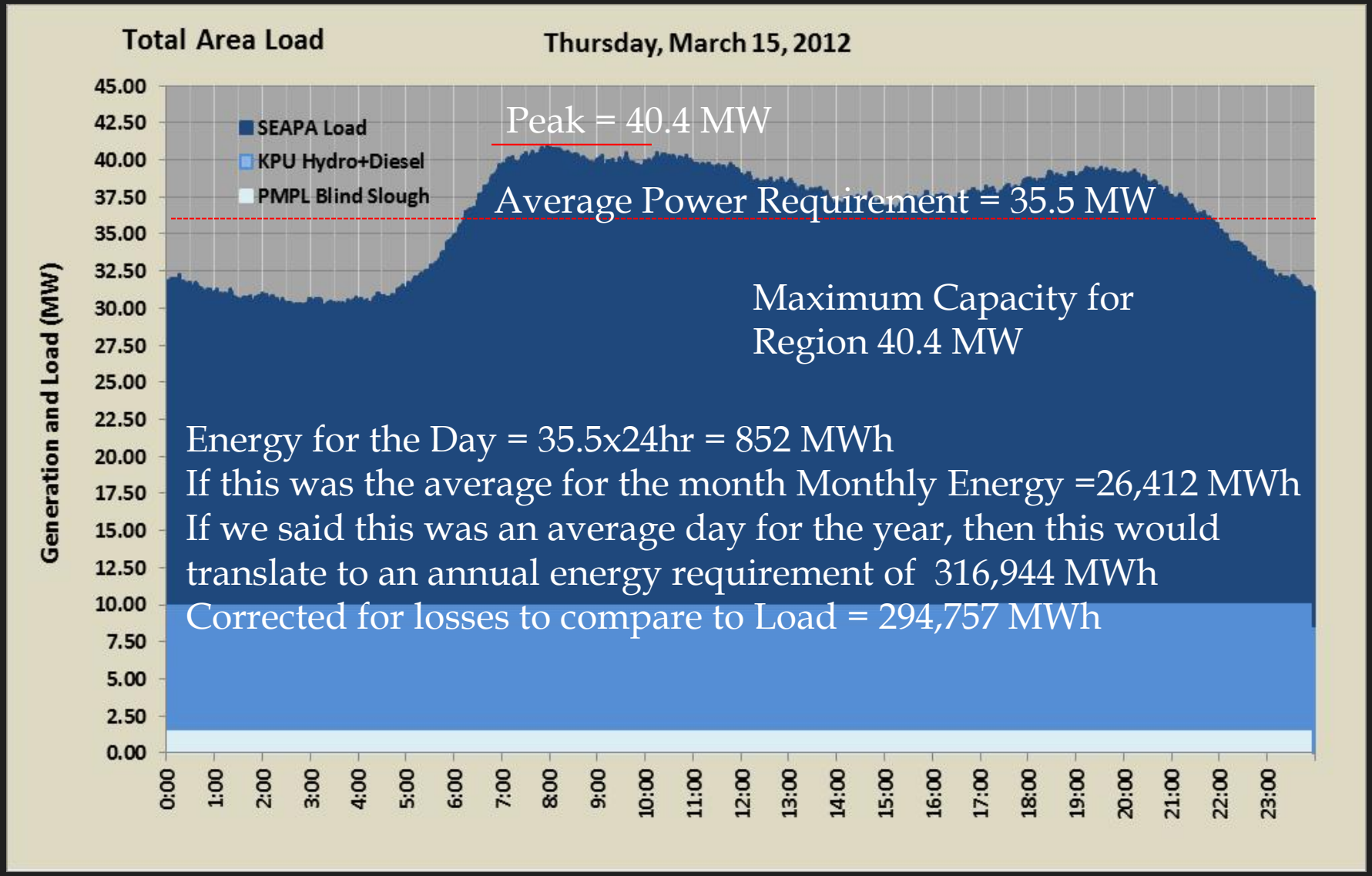
Just what is a load forecast?

It's an estimate of future capacity and energy requirements

Many power planning processes require the utility to prepare and update load forecasts

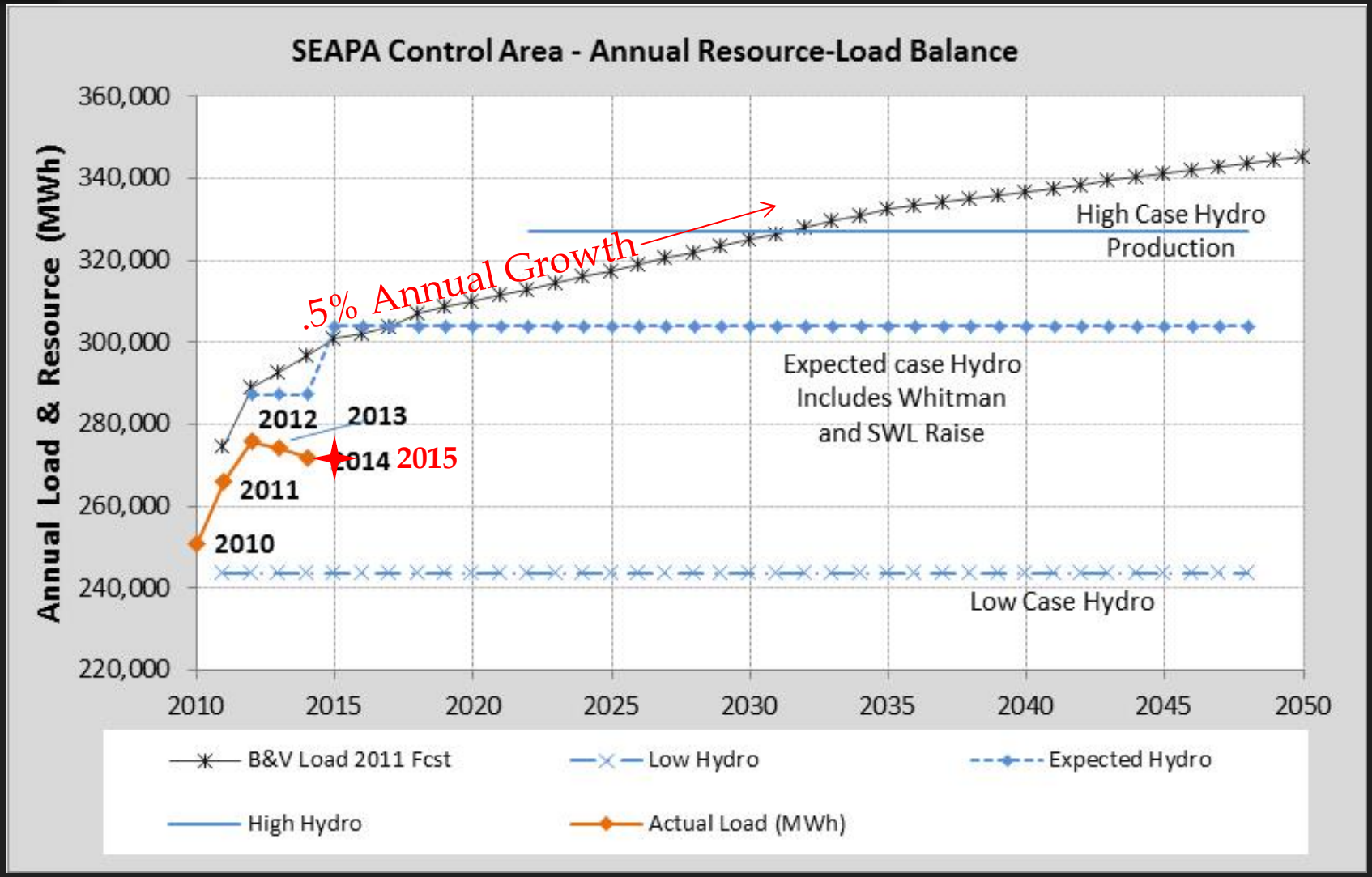
- **Annual avoided Cost updates**
- **Annual Revenue Forecasts**
- **Most Utilities update their Integrated Resource Plans every other year**
- **Studies for future generation resources**
  - **How big should it be?**
  - **How often would it operate, what would it displace?**

Load Forecasting-Capacity and Energy



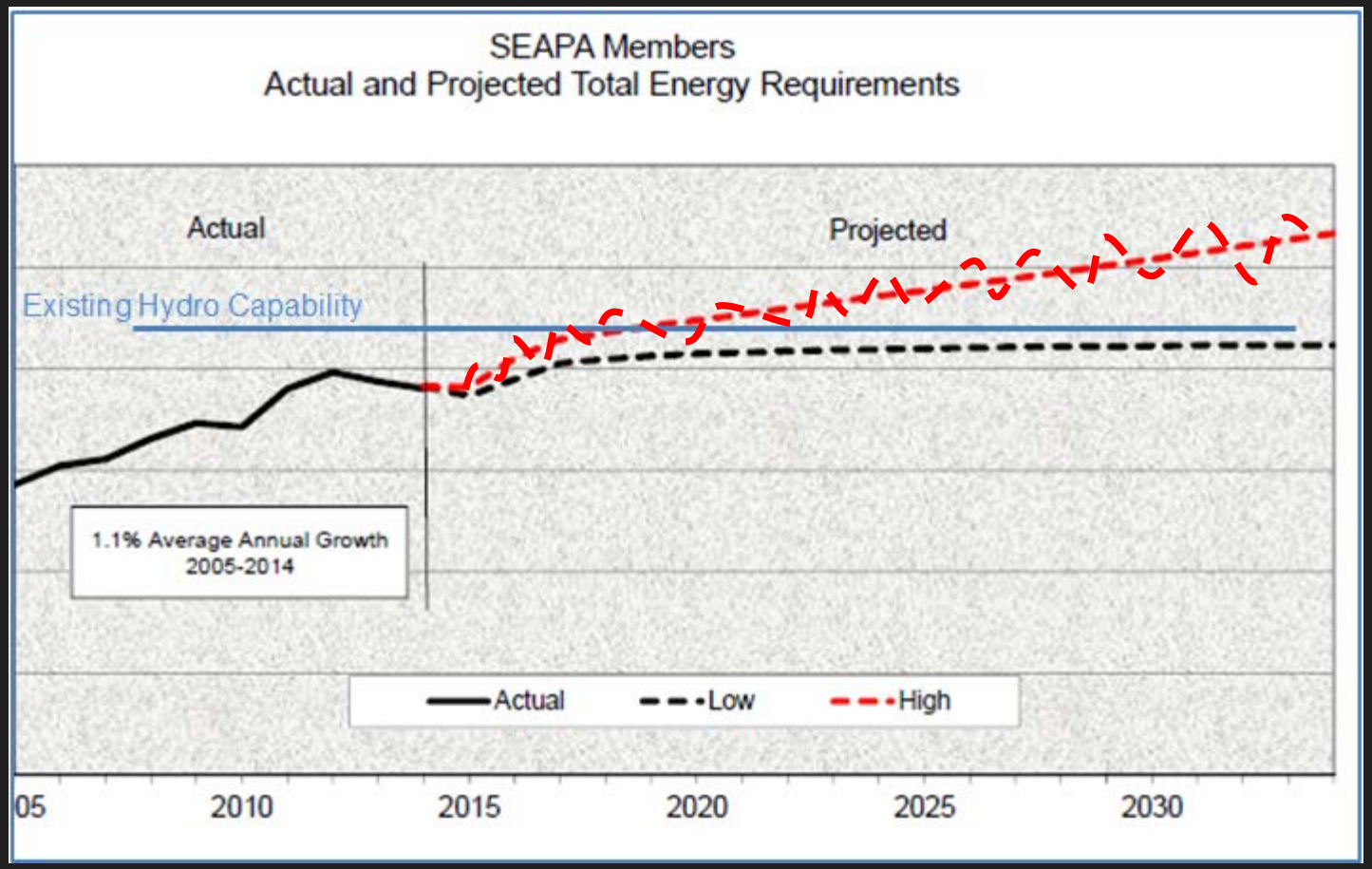
This is total load + distribution losses plus transmission and SEAPA plant consumption

Load Forecasting Effort-The previous forecast past loads



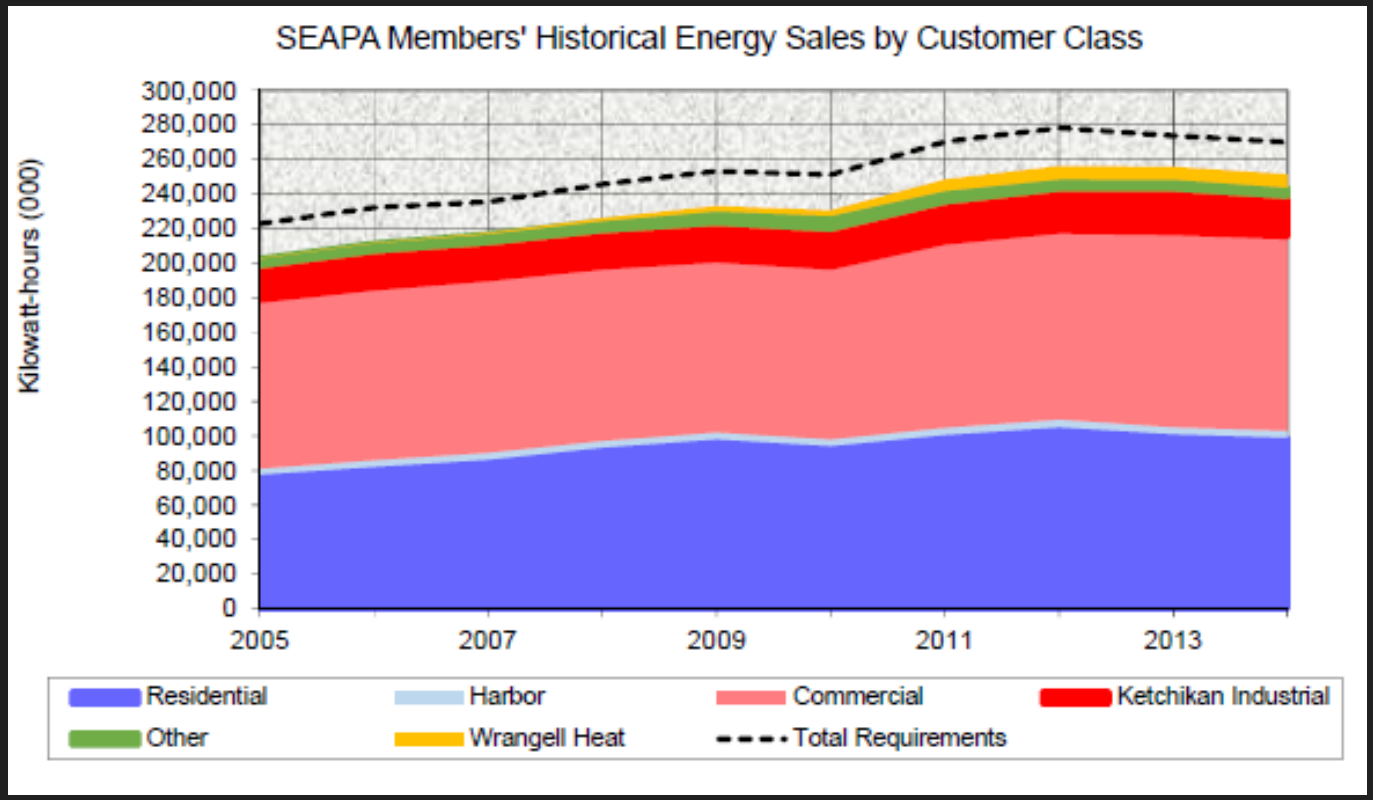
Actual Load (MWh)	2,010	2,011	2,012	2,013	2,014
KTN-PSG-WRG	250,873	266,188	275,845	274,096	271,861

Load Forecasting- This is our future needs estimate



The high and low cases of course have uncertainty and natural variation, we have asked the contractor (John Heberling to provide expected annual deviations for both cases- why isn't there just one set of deviations?

Load Forecasting-Energy Customer Class



The total energy, all year long for all three cities, is shown at left, this is what we needed in the past

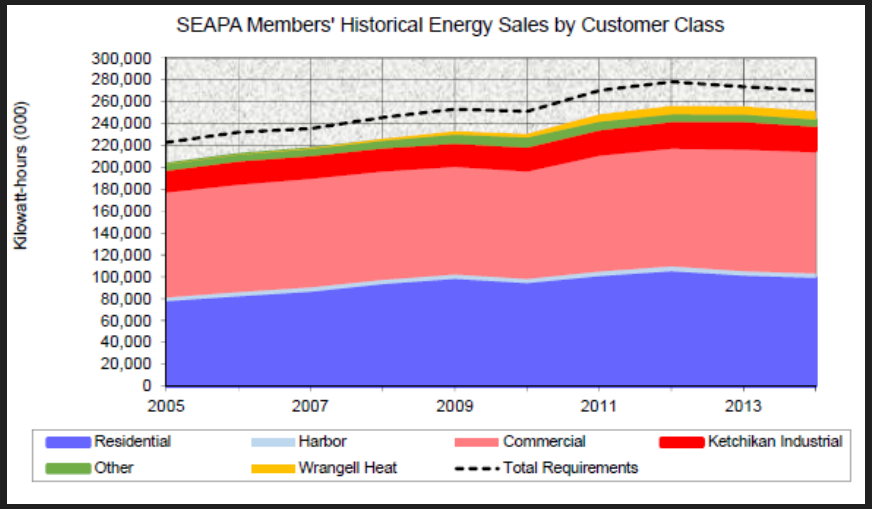
KETCHIKAN ***HIGH GROWTH***

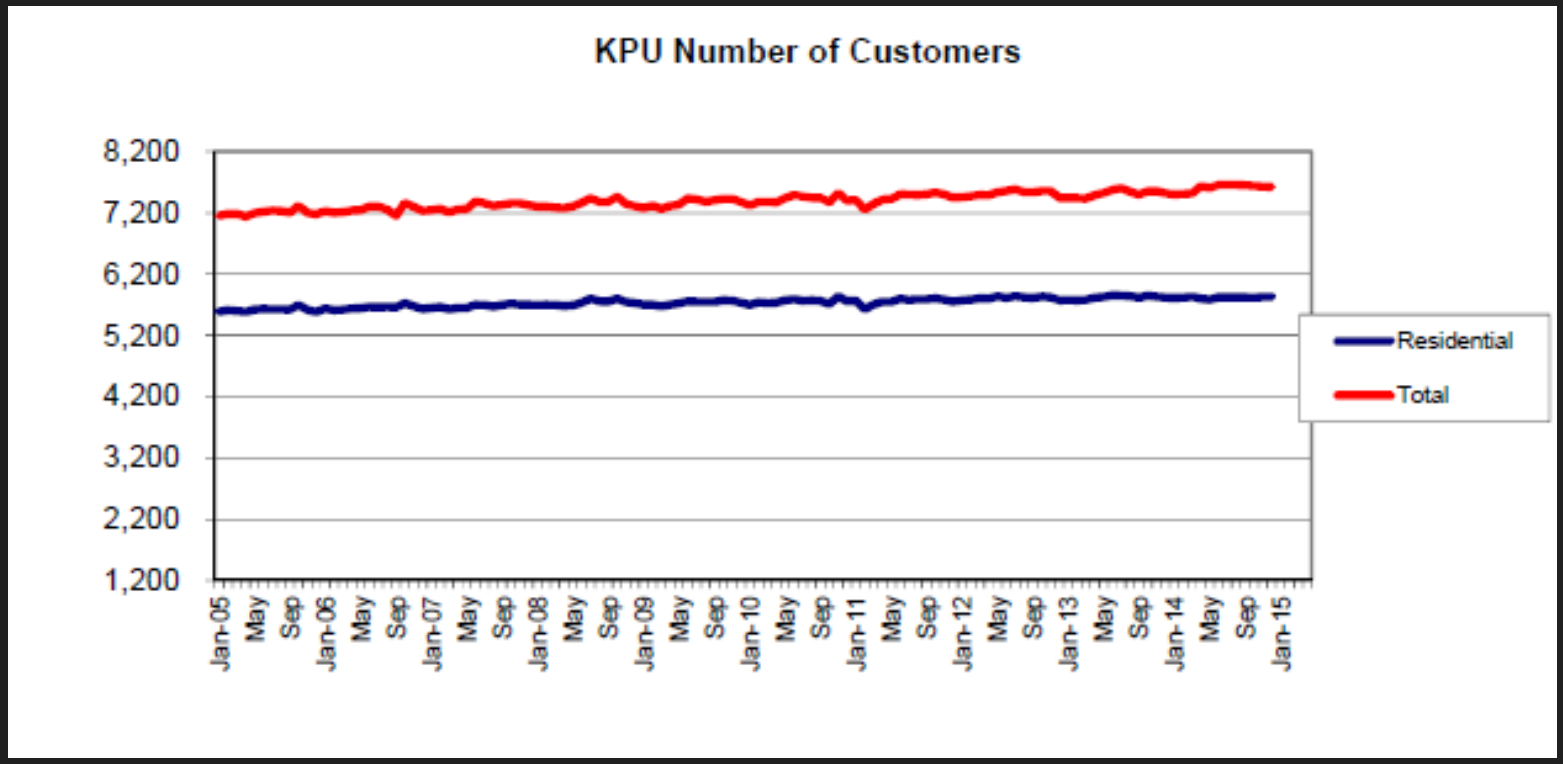
Year	Residential	Annual Change	Harbor	Commercial	Annual Change	Industrial w/o Shpyrd	Shipyard	Lighting	Total Sales	Annual Change	Own Use	Losses	Total Energy Requirements	Loss % of Total Reqs.	Peak Demand (kW)
2014 (Act.)	67,665,456		2,495,965	72,777,304		17,337,242	6,071,400	1,591,788	167,939,155		1,687,513	6,817,039	176,443,707	3.9%	30,500
2015	63,592,692	-6.0%	2,313,761	74,594,735	2.5%	17,510,614	6,071,400	1,603,019	165,686,221	-1.3%	1,700,000	6,974,426	174,360,647	4.0%	29,271

Looking at the details by customer class- this is important as things change we understand the impact as either significant or minor

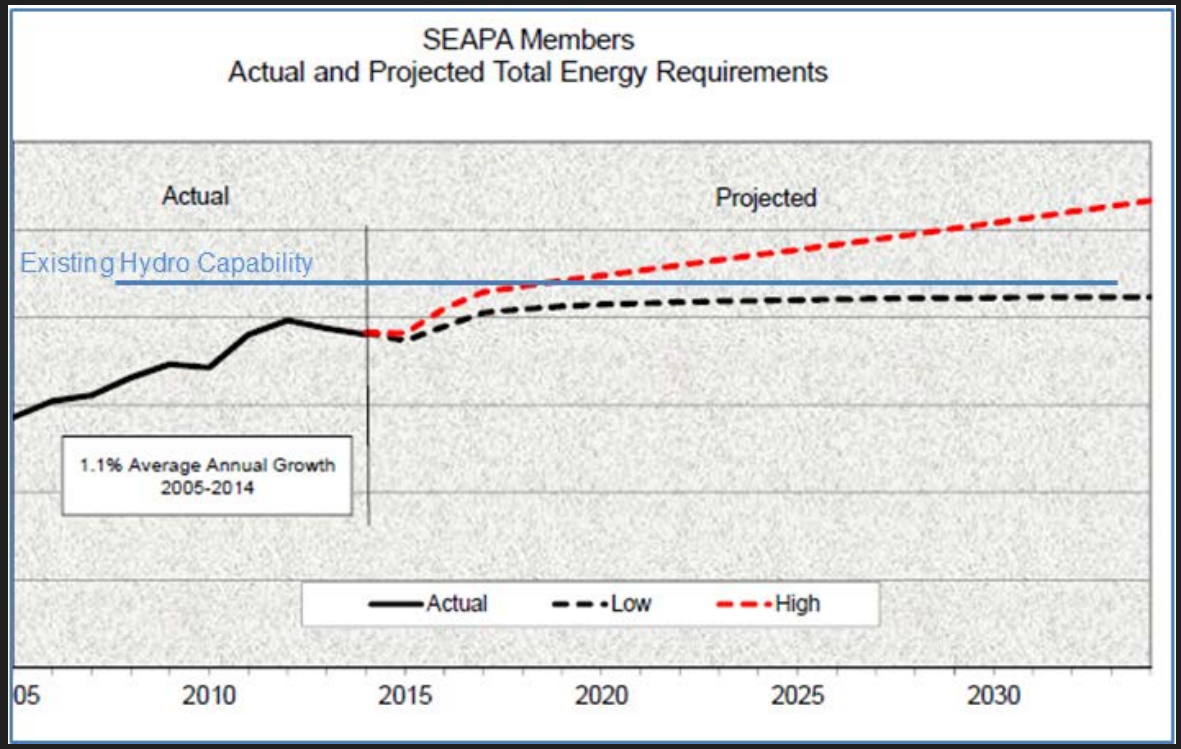
Load Forecasting

Identifying the key drivers
Economic policy, Population Trend and climate for LT energy, weather for capacity and water levels (ST Energy) in the case of this case impacts to commercial and residential resulting from population trends)





Load Forecasting- High and Low



Population- low case uses the most recent AK Dept. of Labor (DOL) report; The high case uses the resent past population rates for KTN & WRG and a bit "bullish" for PSG in contrast to the DOL report

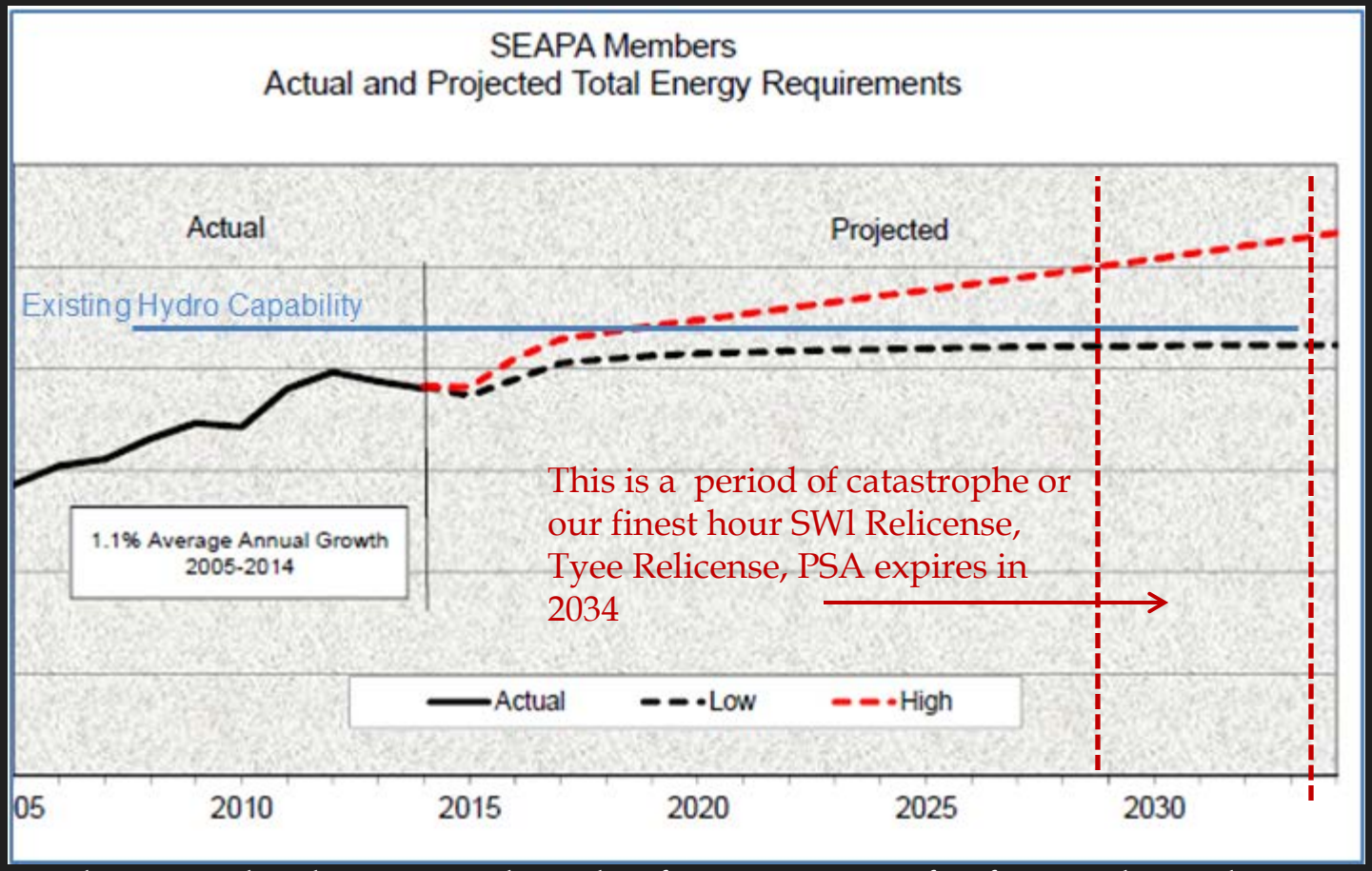
Commercial Loads- maintain for low case, continued expansion for high case based on recent past growth rates

Industrial- Fish Processing the same for both cases- based on last three years

Weather- 2015 HDD for 2015 was 80% of 2012!, low case uses NOAA average, the high case uses the maximum month of the previous 10 yrs. (each month high consecutively)

Load Forecasting

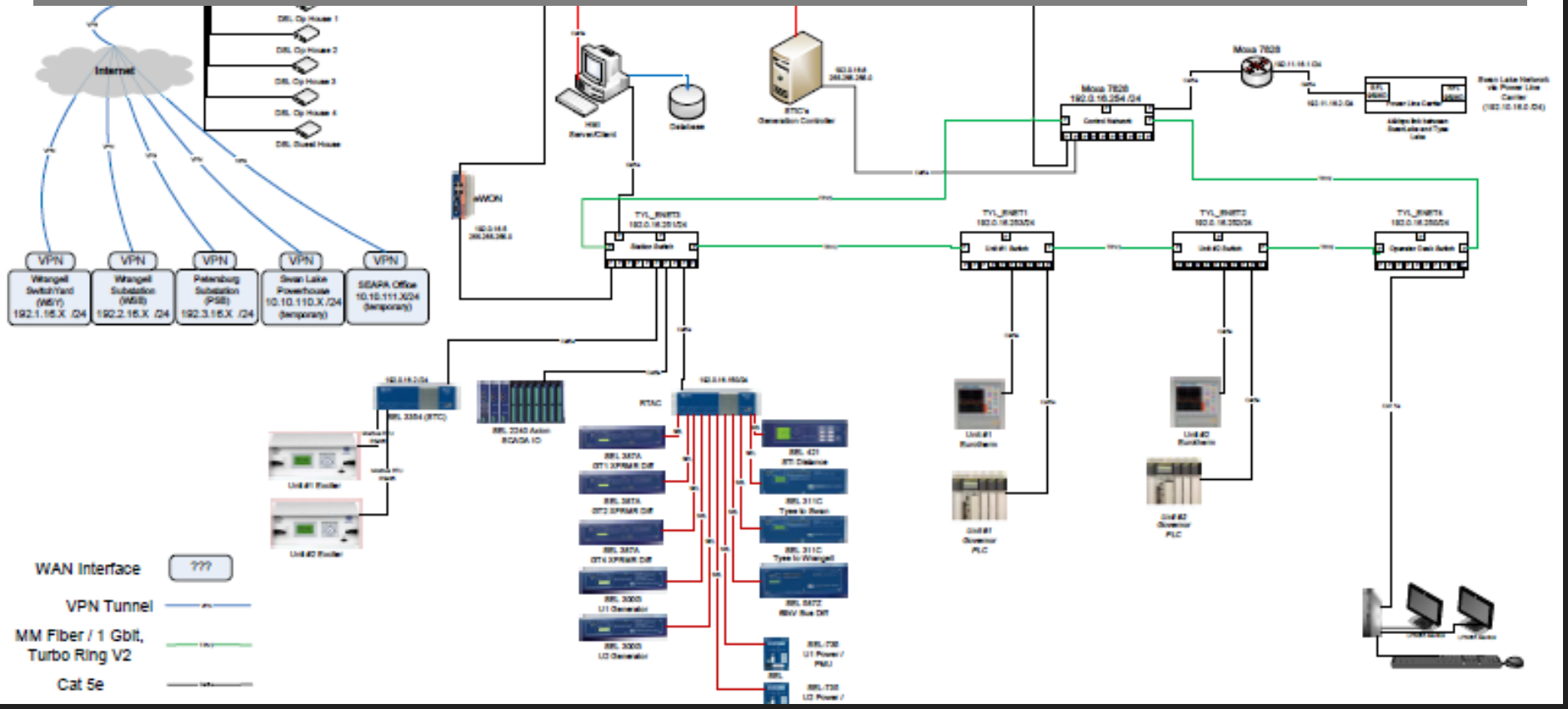
	Table of Diesel Generation and Spilled Energy (MWh)			
	KPU Non-Maintenance Diesel Generation	Swan Lake Spilled Energy	Tyee Lake Spilled Energy	SEAPA Spilled Energy
2010	0	8,456	29,043	37,499
2011	3,059	21,324	24,092	45,416
2012	727	11,318	42,458	53,777
2013	10,663	0	0	0
2014	0	23,808	19,125	42,933
2015	0	55,082	20,463	75,545
2016	0			



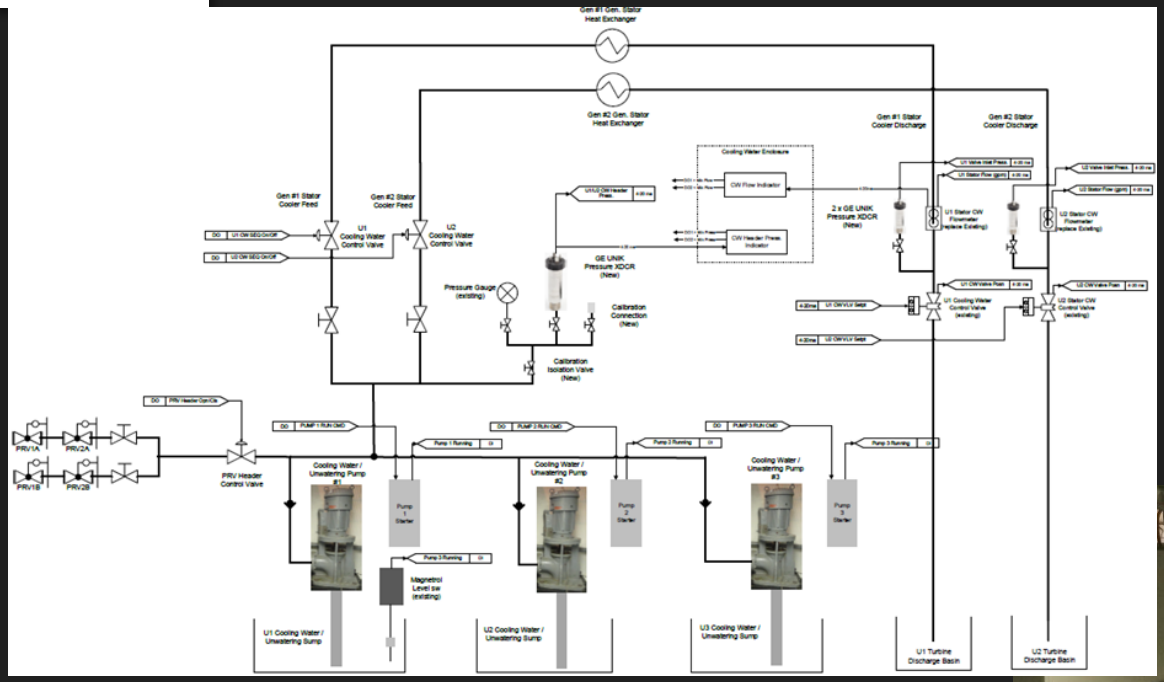
This what we think we need in the future, part of a future board conversation

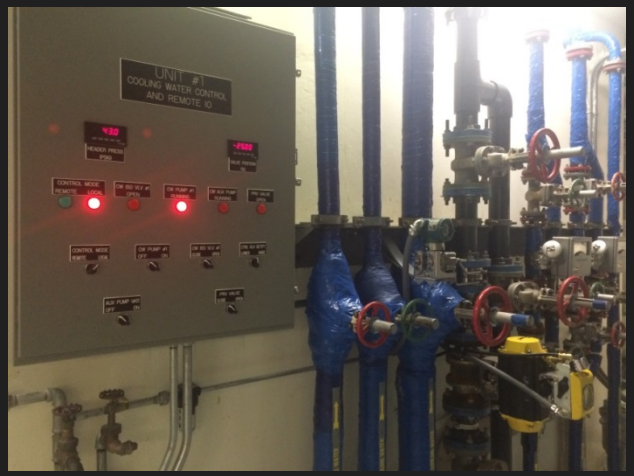
Alarm-Control-Controls- the Tyee Network

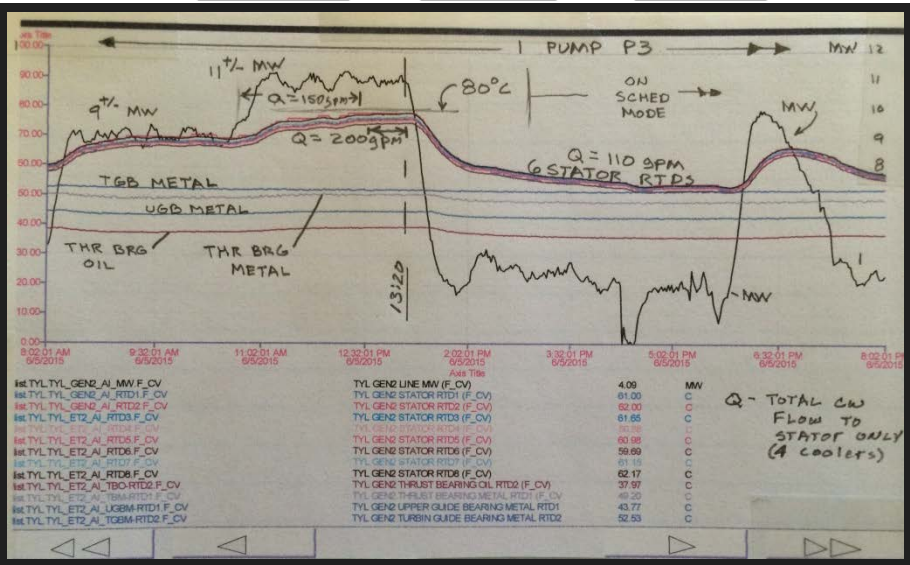
- Increase reliability through upgrade of control and protection equipment
- Integrate improved protection and alarm technology with human operator action
- Increase energy and capacity effectiveness through better control and protection- we will load machines in the future differently than we do today in part because of the SWL Raise, how we monitor and control the machines to reap that storage benefit is changing, so then must the protection



Alarm-Control-Protection-Tyee CW







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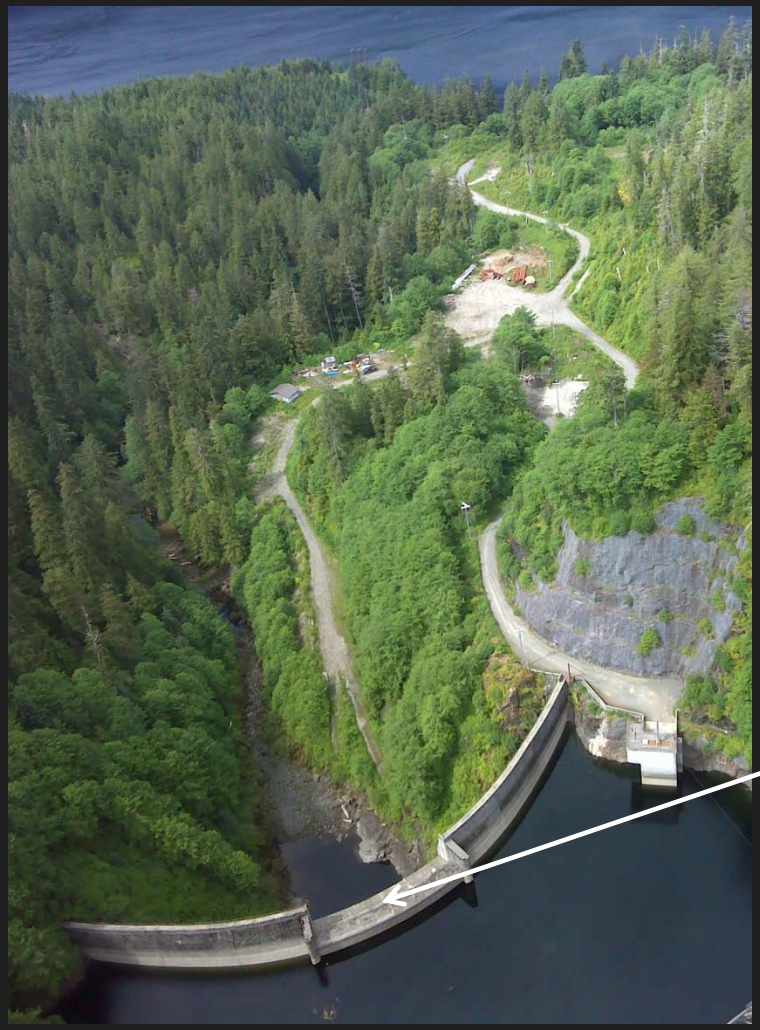
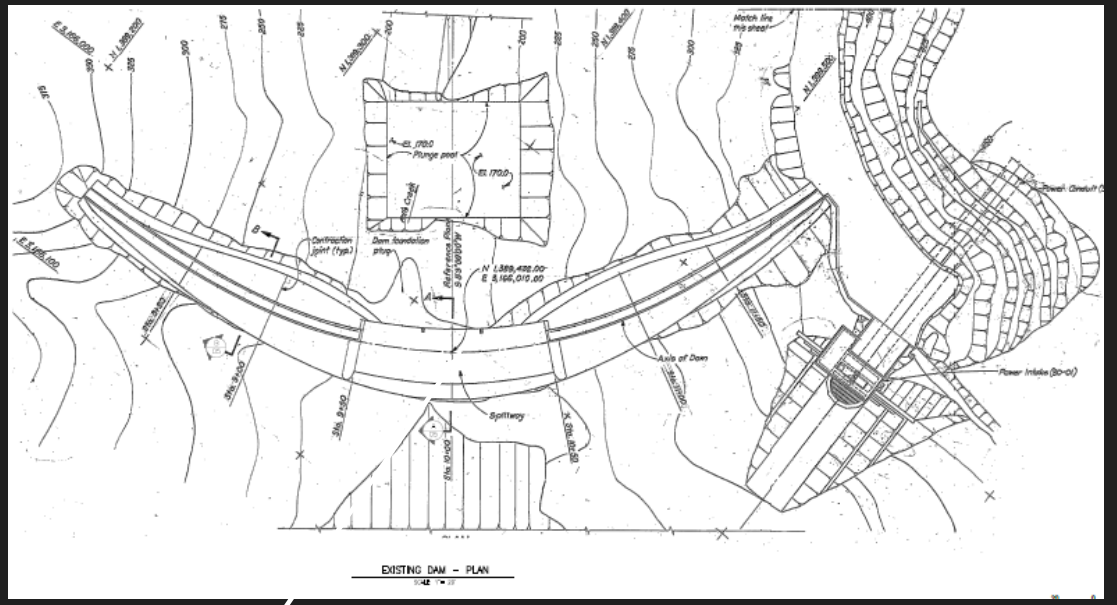
SWAN LAKE RESERVOIR EXPANSION





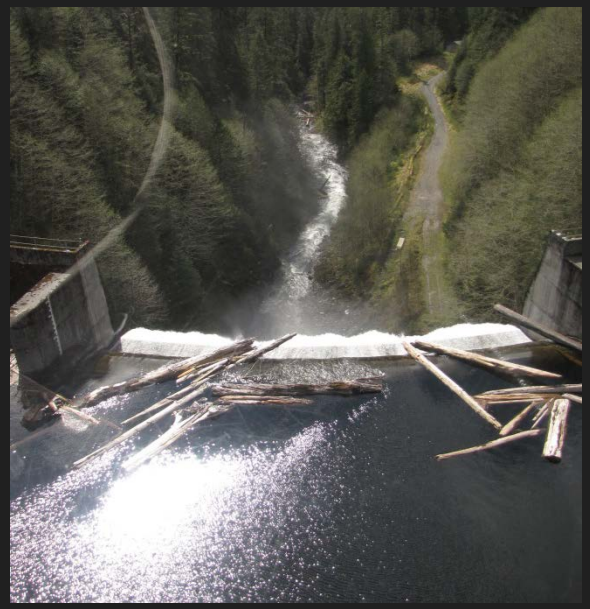
Put a spillway plug here, get a 25% increase in active storage!

What is the big deal about Storage?.....

Swan Lake Reservoir Storage Increase

Why are we doing this project?

- **Swan Lake is capacity long and energy short**
- **It improves System Efficiency**
- **This project is the biggest bang for the buck for displacing future diesel generation**



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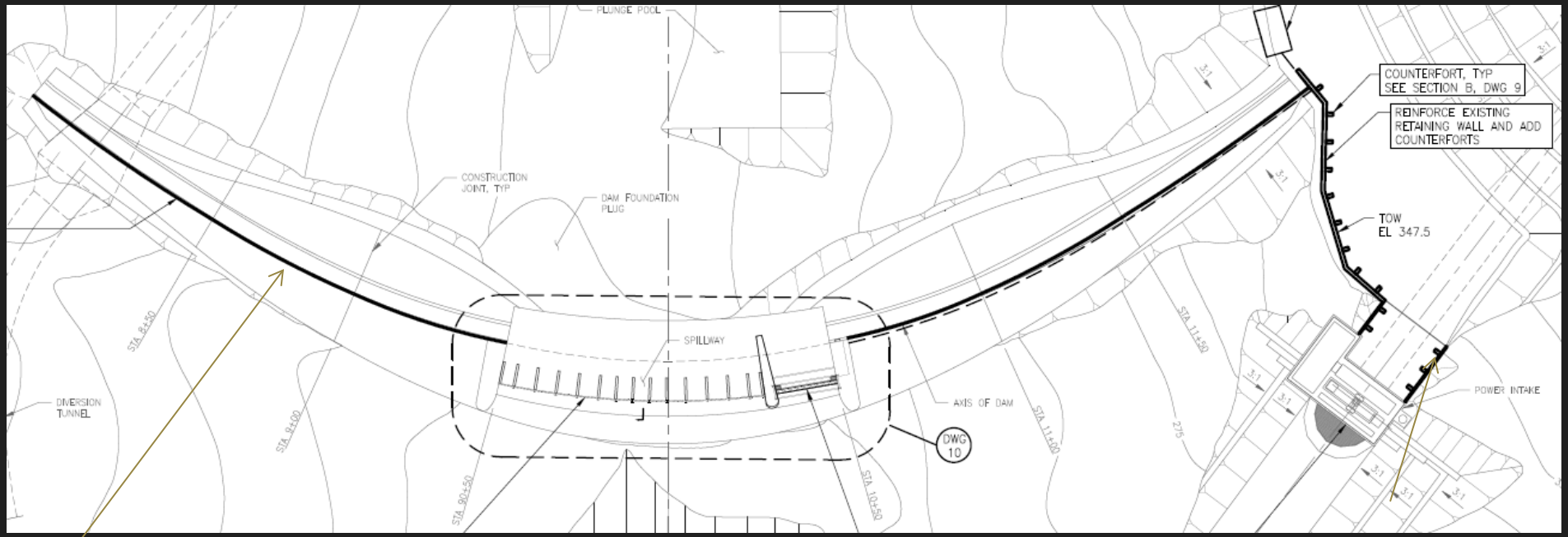
SWAN LAKE RESERVOIR EXPANSION Elevations note



- Parapet Walls along Crest & 5” base slab
- Right Abutment wall
- Raise floor of gate house control room
- New jib crane for logging & on-going log removal
- 20 ft wide vertical control gate
- 78 ft wide, 15’ tall fused panel wall

Swan Lake Reservoir Storage Increase

- We wrote and issued an RFP for the Flash-Board design build effort and signed a contract with Kuenz USA

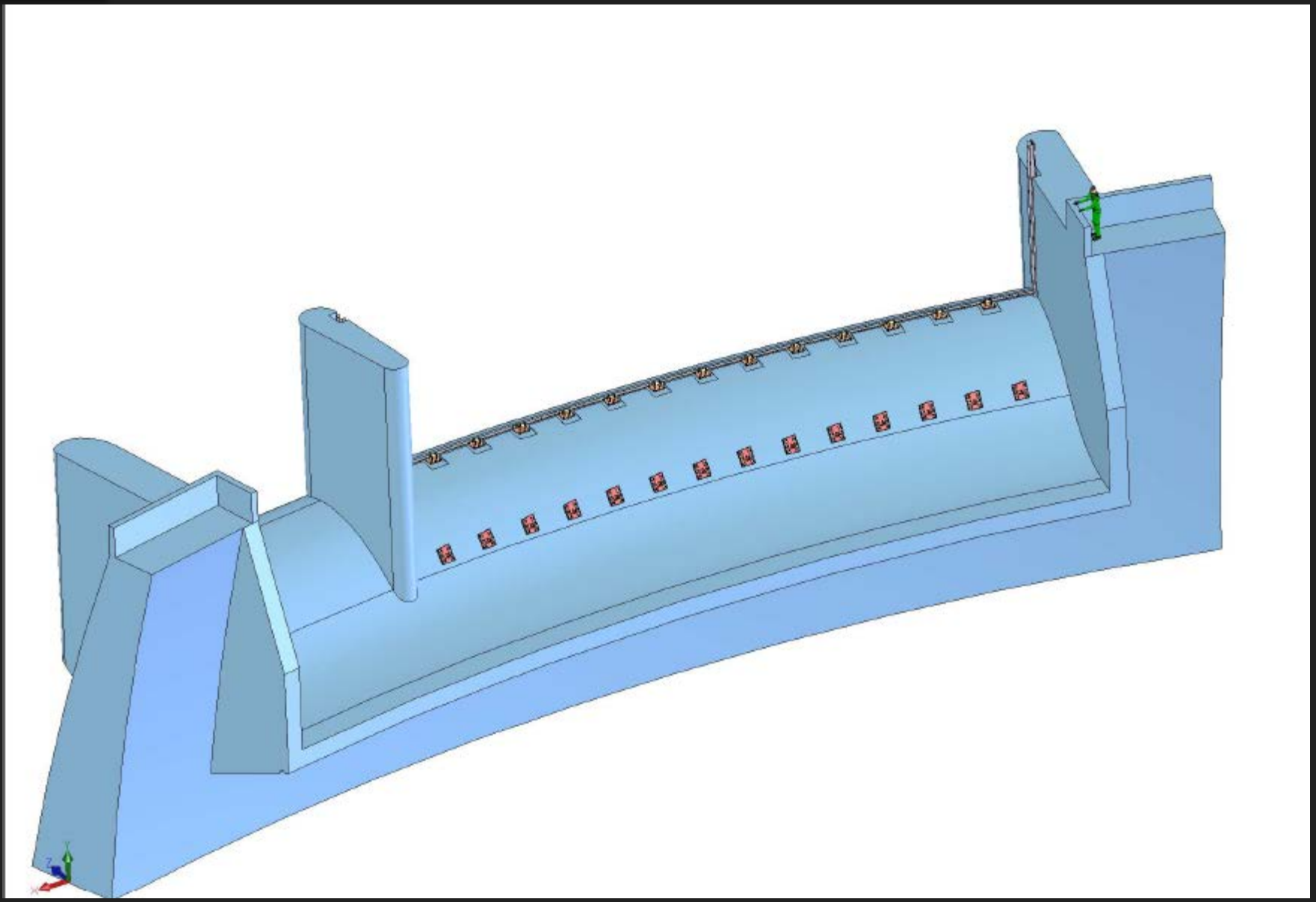
- We wrote and issued a RFP for the Fixed Wheel gate and signed and Agreement with Kuenz USA for the Gate and embedded metals
- We are wrote and issued for bid the civil construction, and we have a new business item

Task	Start	Finish
Issue Request for Bids	N/A	Monday, February 01, 2016
Mandatory Site Inspection Window	Tuesday, February 09, 2016	Friday, February 12, 2016
Deadline for Bidder Inquiries/Clarifications	Monday, February 1, 2016	Monday, February 22, 2016 at 2:00 p.m. AKST
Bids Due	N/A	Tuesday, March 01, 2016 at 4:00 p.m. AKST
Notice of Recommendation of Award	N/A	Tuesday, March 08, 2016
SEAPA Special Board Meeting for Award	N/A	Tuesday, March 15, 2016
Contract Conformance Period	Tuesday, March 08, 2016	Friday, March 25, 2016 at 12 Noon
Notice to Proceed	N/A	Friday, March 25, 2016
Preconstruction Conference	N/A	Tuesday, April 12, 2016
Mobilization	Monday, May 02, 2016	Monday, May 30, 2016
Construction	Monday, May 16, 2016	Friday, September 30, 2016
Owner Controlled Reservoir Levels	Wednesday, June 01, 2016	Saturday, October 01, 2016
Owner Furnished Vertical Gate on site	N/A	Monday, August 08, 2016
Owner Furnished Flashboard System on site	N/A	Monday, August 08, 2016
Vertical Gate Dry Testing	Thursday, September 15, 2016	Friday, September 30, 2016
Water Loaded Vertical Gate Testing	Friday, October 14, 2016	Sunday, October 30, 2016
Demobilization	Saturday, October 15, 2016	Tuesday, November 15, 2016

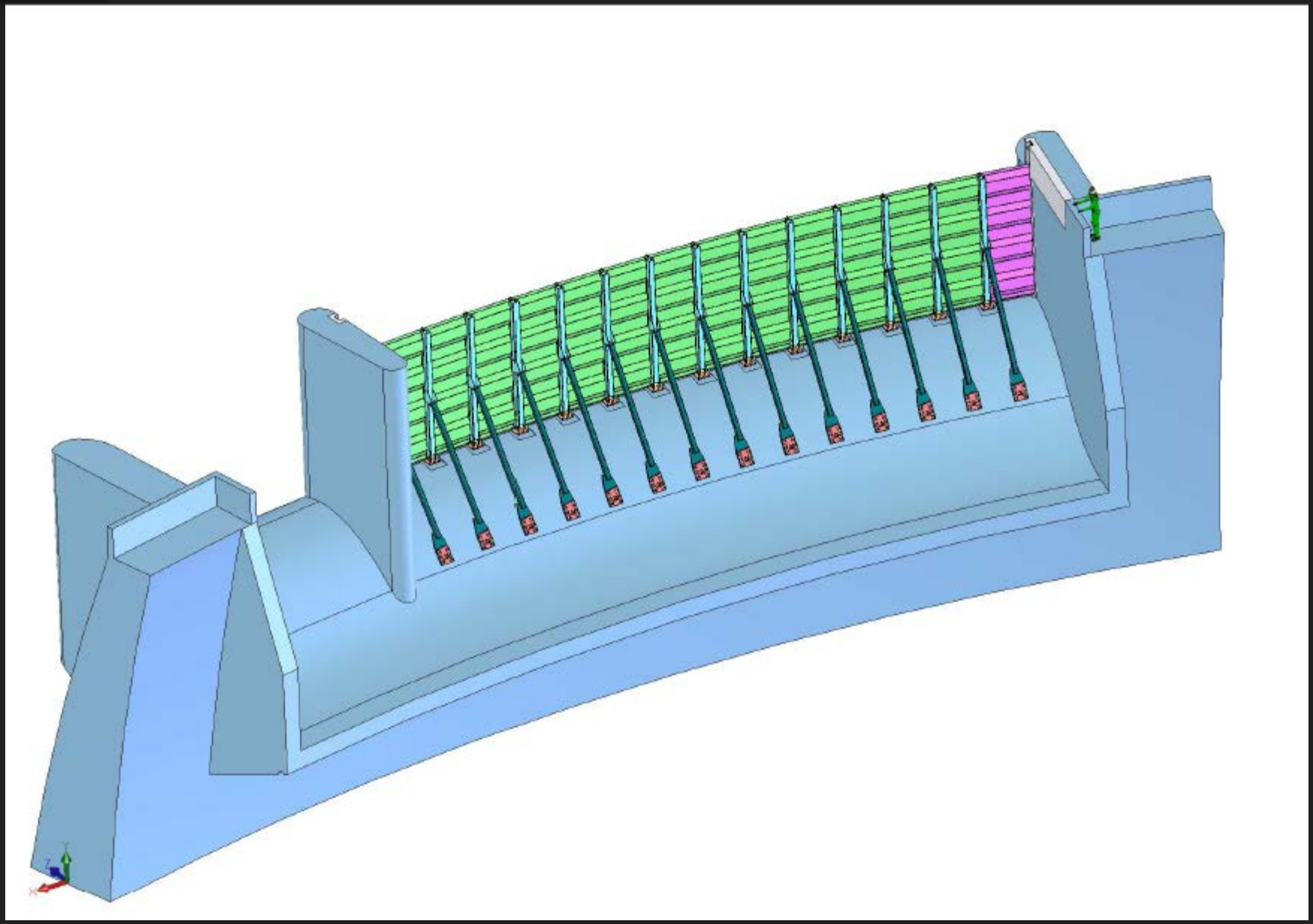
Swan Lake Reservoir Storage Increase

Open solid Works Model

Questions



Swan Lake Raise- Kuenz Solid Works



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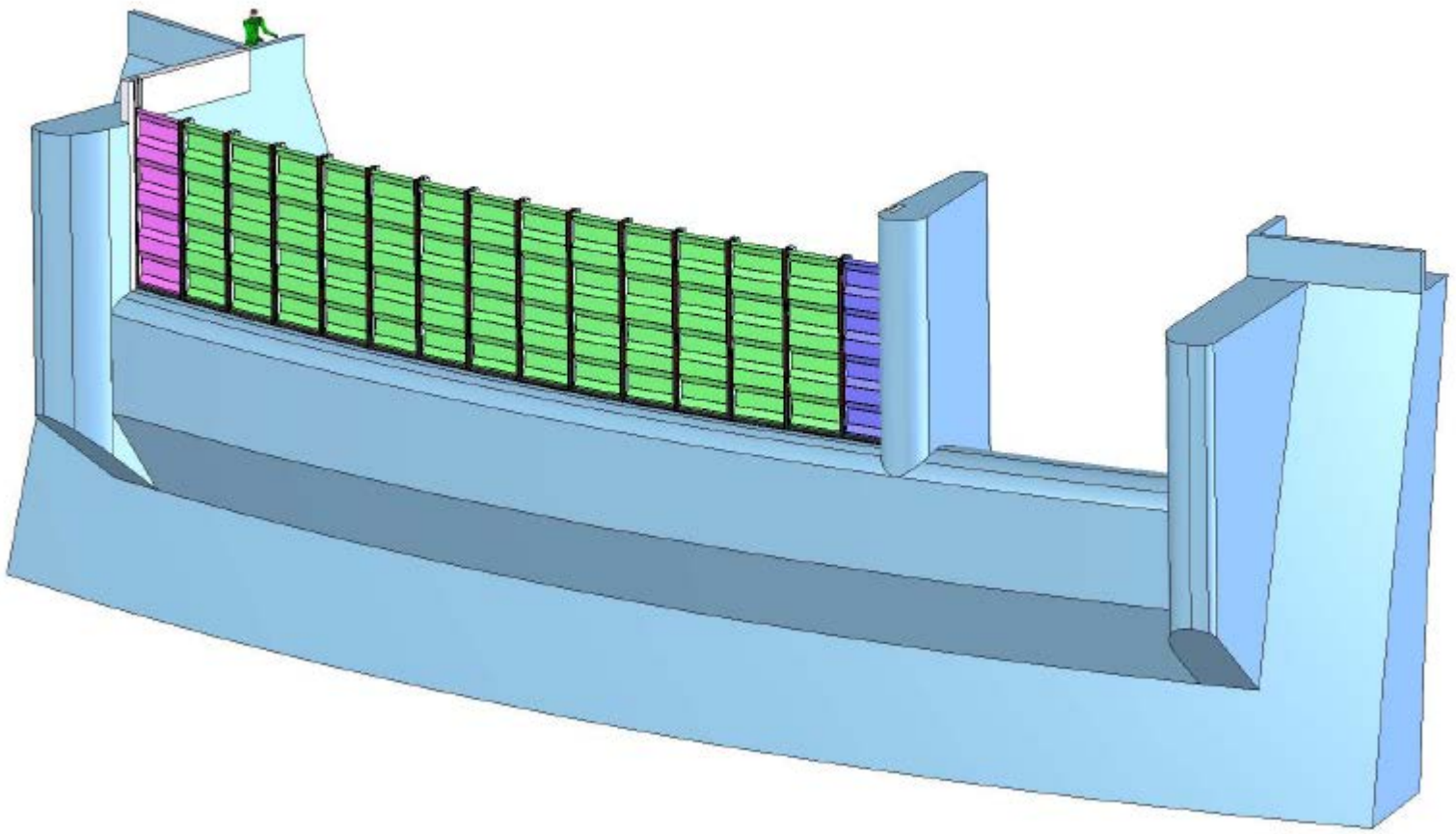
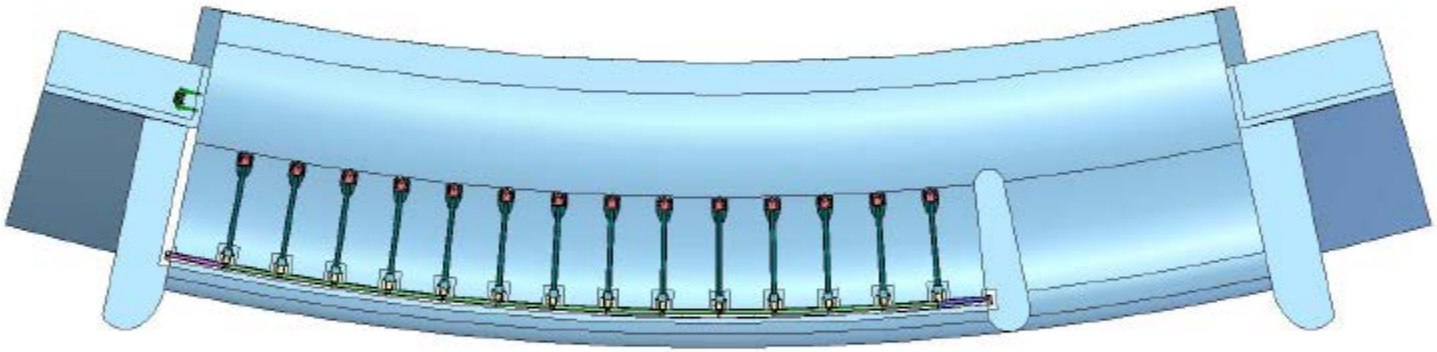
Title



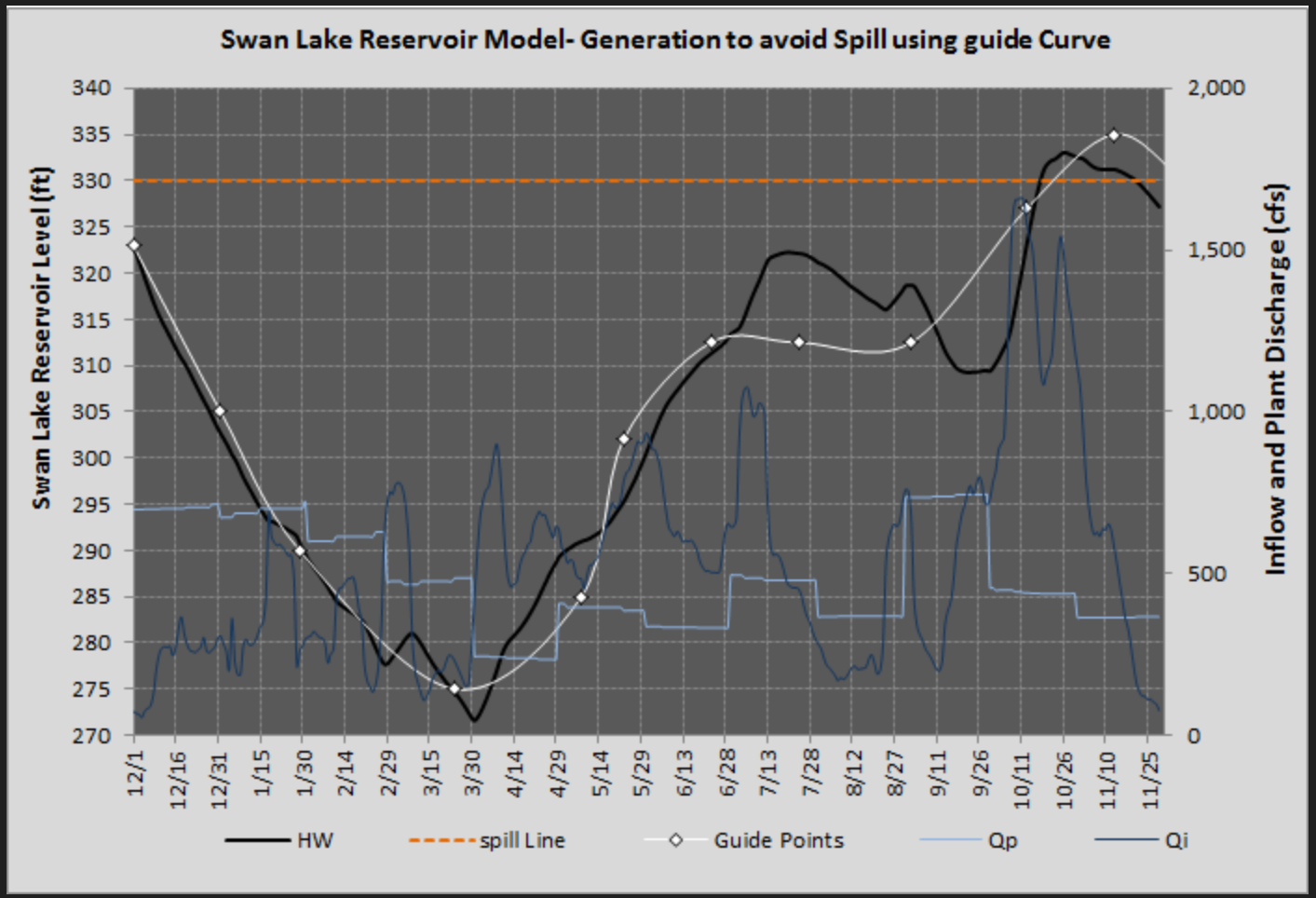


Water Management Discussion

2016 Operations Plan

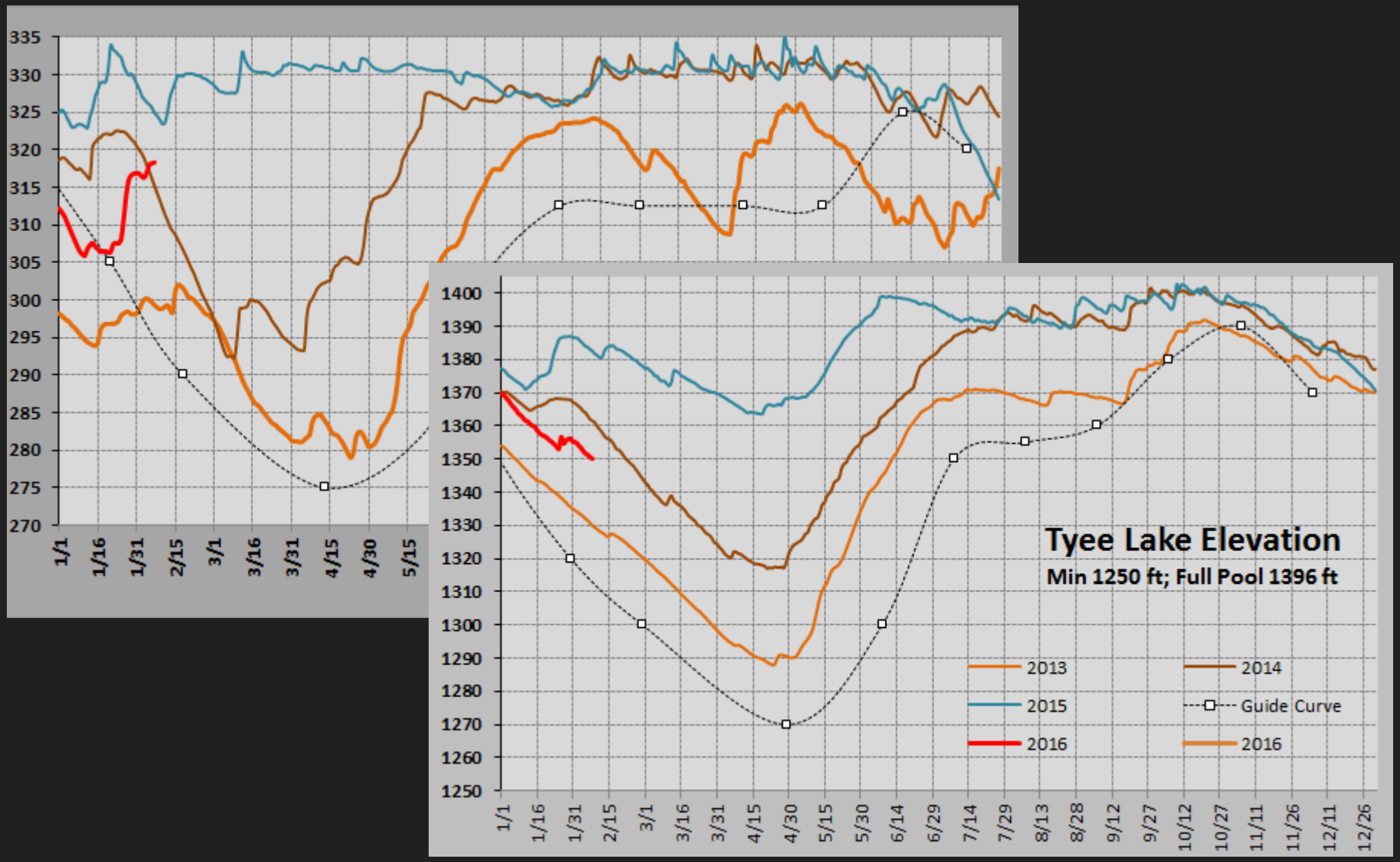
Guide	Use Schedule for Pgen?		
Points	Yes	Unit 1	Unit 2
323.0	Jan	7.0	7.0
305.0	Feb	11.5	0.0
290.0	Mar	9.0	0.0
275.0	Apr	4.0	0.0
285	May	8.0	0.0
302.0	Jun	7.0	0.0
312.5	Jul	11.0	0.0
312.5	Aug	8.0	0.0
313	Sep	8.0	8.0
327	Oct	10.0	0.0
335	Nov	8.0	0.0
330	Dec	7.5	7.5

We would need the average generation shown in the table at left to avoid spill during construction

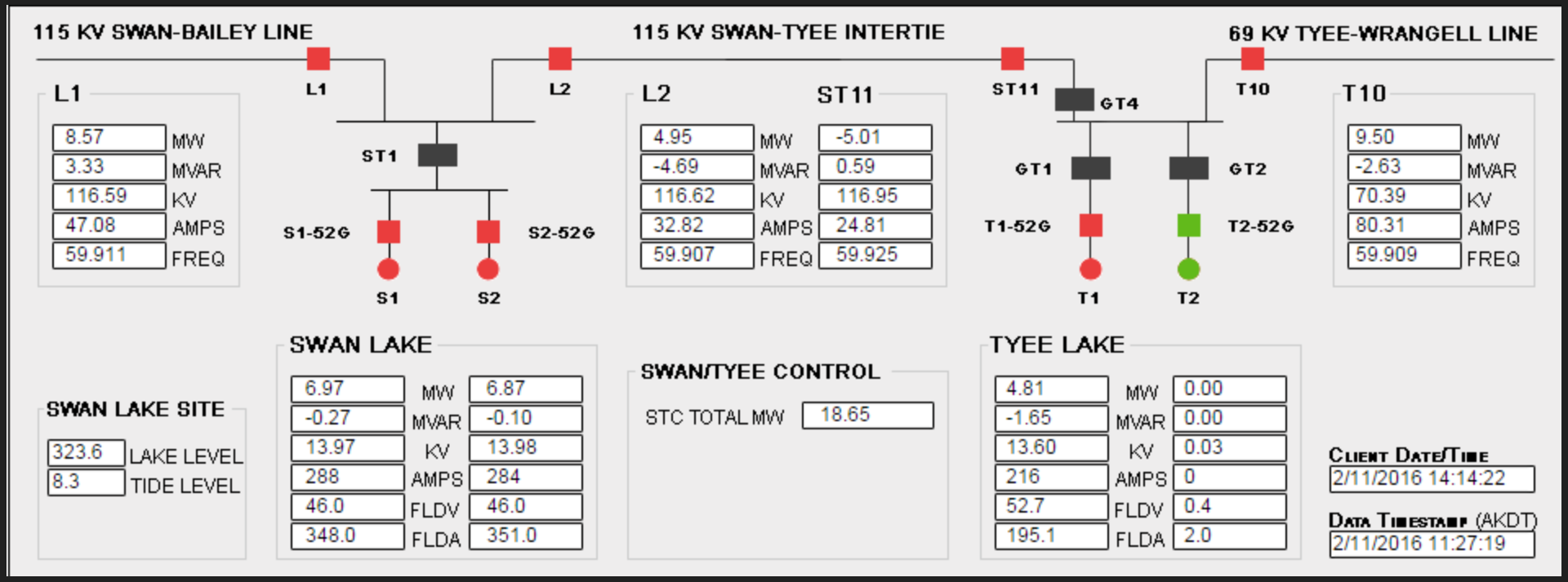


This points out the difficulty of filling for Winter and avoiding October Spill

Water Management Discussion



Get used to this, it will be different



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Questions