

Overview of 2017 Report of the Statewide Advisory Committee on Cooling Water Intake Structures

Prepared by the Inter-Agency Working Group

SACCWIS Meeting

May 4, 2017

Agenda

- Background
- Progress towards goals
- Water Usage by the OTC Fleet
- Relevant Actions by CEC, CPUC, and ISO
- Update on Existing OTC Plants & Generator Plans
- Recommendations & Next Steps

OTC Compliance and Infrastructure Planning

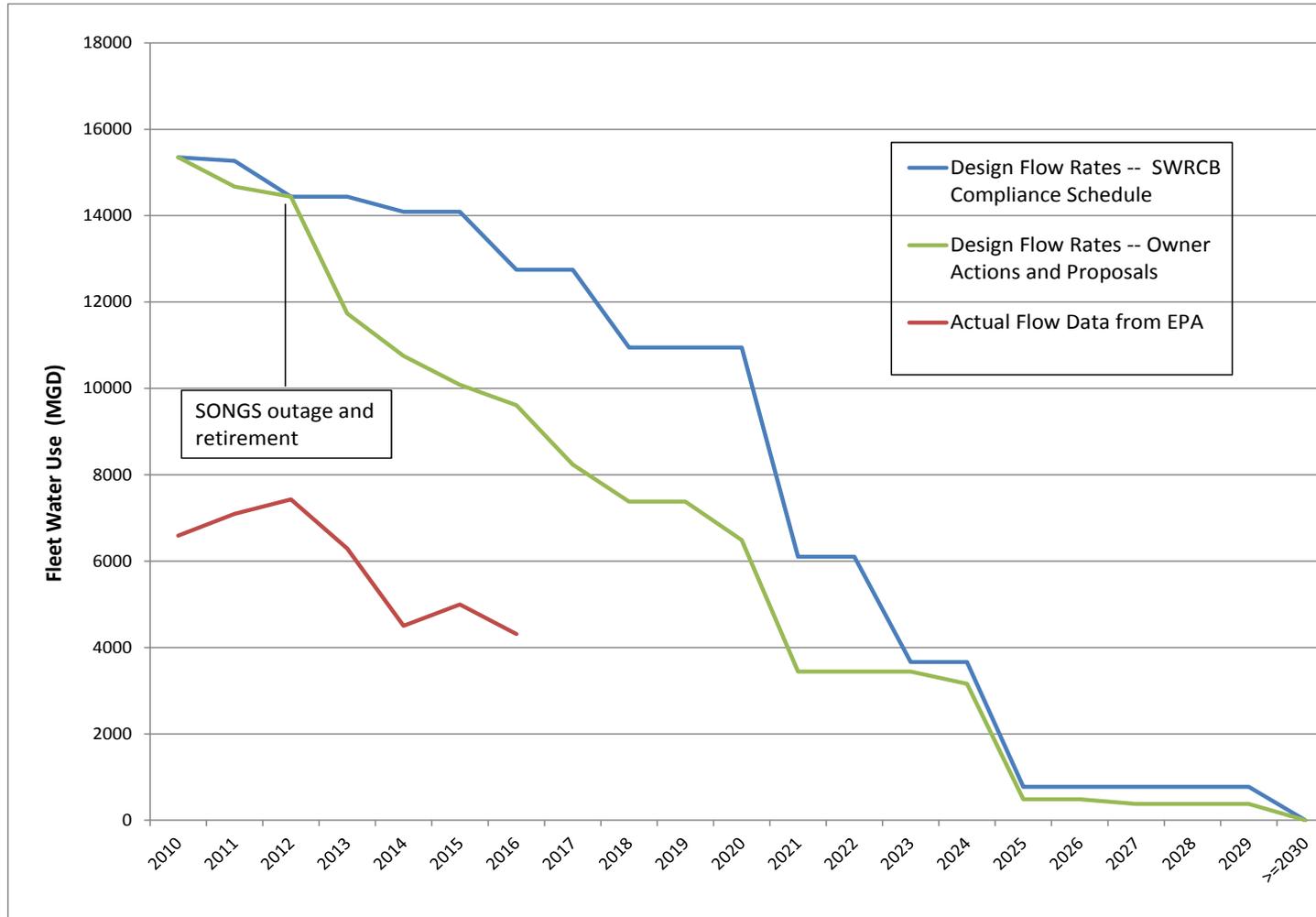
- SACCWIS annual review of adopted OTC facility compliance dates for infrastructure realities is a key element of adopted OTC policy
- CPUC, ISO and CEC continue to assess resource, infrastructure and reliability needs:
 - CPUC Long-Term Procurement Plan (LTPP)
 - ISO Transmission Planning Process (TPP)
 - CEC Application for Certification Process (AFC)

Once-Through Cooling Compliance Achievement

Facility & Units	NQC	Compliance Date	Retirement Date
Humboldt Bay 1, 2	135	Dec. 31, 2010	Retired Sept. 30, 2010
South Bay	296	Dec. 31, 2011	Retired Dec. 31, 2010
Potrero 3	206	Oct. 1, 2011	Retired Feb. 28, 2011
Huntington Beach 3, 4	452	Dec. 31, 2020	Retired Nov. 1, 2012*
Contra Costa 6, 7	674	Dec. 31, 2017	Retired April 30, 2013
El Segundo 3	335	Dec. 31, 2015	Retired July 27, 2013
Haynes 5, 6	318	Dec. 31, 2013	Retired June 13, 2013
San Onofre 2, 3	2,246	Dec. 31, 2022	Retired June 7, 2013
Morro Bay 3, 4	650	Dec. 31, 2015	Retired Feb. 5, 2014
El Segundo 4	335	Dec. 31, 2015	Retired Dec. 31, 2015
Scattergood 3	497	Dec. 31, 2015	Retired Dec. 31, 2015
Pittsburg	1,159	Dec 31, 2017	Operations ceased Dec 31, 2016
Moss Landing 6, 7	1,509	Dec. 31, 2020	Retired January 1, 2017
Encina Unit 1	106	Dec 31, 2017	Retired March 1, 2017

*Converted to Synchronous Condensers on interim basis to provide voltage support due to SONGS retirement

Historic and Projected Water Usage Combined OTC Fleet



Source: CEC and SWRCB Staff

Once-Through Cooling Compliance Plans for Remaining Units

Facility & Units	NQC	Compliance Date	Owner proposed Compliance Method
Alamitos 1,2,5	848	Dec. 31, 2020	Plans to retire on Dec.31, 2019 to allow Alamitos be repowered
Alamitos 3,4,6	1,163	Dec. 31, 2020	Retire units
Encina Units 2-5	844	Dec. 31, 2017 *	Retire units by compliance date
Harbor 5	229	Dec. 31, 2029	Plans to repower on Dec.31,2026
Haynes 1, 2	444	Dec. 31, 2029	Plans to repower on Dec.31,2023
Haynes 8	575	Dec. 31, 2029	Plans to repower on Dec. 31, 2029
Huntington Beach 1	215	Dec. 31, 2020	Plans to retire on Dec. 31, 2019
Huntington Beach 2	215	Dec. 31, 2020	Retire unit
Mandalay 1, 2	430	Dec. 31, 2020	Repower with 262 MW Puente Power Project
Moss Landing 1, 2	1,020	Dec. 31, 2020	Track 2
Ormond Beach 1, 2	1,516	Dec. 31, 2020	Retire Units
Redondo 7	493	Dec. 31, 2020	Plans to retire on Oct 1, 2019 to allow Huntington Beach repower
Redondo Beach 5,6,8	848	Dec. 31, 2020	Retire units
Scattergood 1, 2	367	Dec. 31, 2024	Plans to repower by Dec 31,2020

* SACCWIS recommended to State Water Board to amend the compliance deadline of the OTC Policy for Encina Units 2-5 from December 31, 2017 to December 31, 2018.

CEC Actions

- Alamitos – AFC was approved by the CEC on April 12, 2017.
- Huntington Beach – AFC was approved by the CEC on April 12, 2017.
- Redondo Beach – AFC is currently suspended.
- Puente Power Project (Mandalay) - AFC for a 262 MW power plant was filed on April 15, 2015, and is in process.

CPUC Actions

- Approved contracts for a total of 2,087 MW of capacity in SCE territory
 - 1,644 MW of gas fired generation
 - 443 MW of preferred resources and energy storage
 - 54.5 MW of resources under review
- Approved 500 MW re-power of Encina Power Station in SDG&E territory
- Operational 300 MW from Pio Pico in SDG&E territory

ISO Actions

- Continued facilitation of Board Approved Transmission Projects
 - Synchronous Condensers in service at Talega (SDG&E territory) and Huntington Beach (SCE territory)
 - Five other SDG&E territory and two SCE territory transmission projects expected from June 2017 through 2021.
- The 2016/2017 Transmission Plan indicates that the authorized resources and previously-approved transmission projects are working together to meet the reliability needs in the LA Basin and San Diego areas.
- The ISO's 2018 Local Capacity Technical Analysis was posted on May 1, 2017

Pittsburg (2017)

- Permanently ceased once-through-cooling operation for all three units (5, 6 and 7) and as of December 31, 2016
- NRG placed the Pittsburg units on long term outage effective January 1, 2017 to preserve deliverability status for a potential replacement project at the same location that would not use once-through-cooling
- Pittsburg Power Plant has come into compliance with its OTC schedule before its originally projected date

Moss Landing (2017, 2020)

- Moss Landing is single largest power generating facility in CA
 - Units 5-6 are old steam boilers, 750 MW each
 - Units 1-2 are new combined cycles, 510 MW each
- Units 6 & 7 retired December 31, 2016
- Variable speed drive controls on Units 1-2 completed December 16, 2016
- Units 1 & 2 are scheduled for Track 2 compliance by December 31, 2020
 - Began entrainment sampling on March 22, 2015
 - Plans to complete studies by April 2017
 - All construction is expected to occur during scheduled maintenance outages (no dual unit outages anticipated)
 - Maximum capacity factor for both Unit 1 and Unit 2 will be 78 percent of the allowable capacity factor before Track 2 compliance.
- SACCWIS does not recommend a change in compliance dates

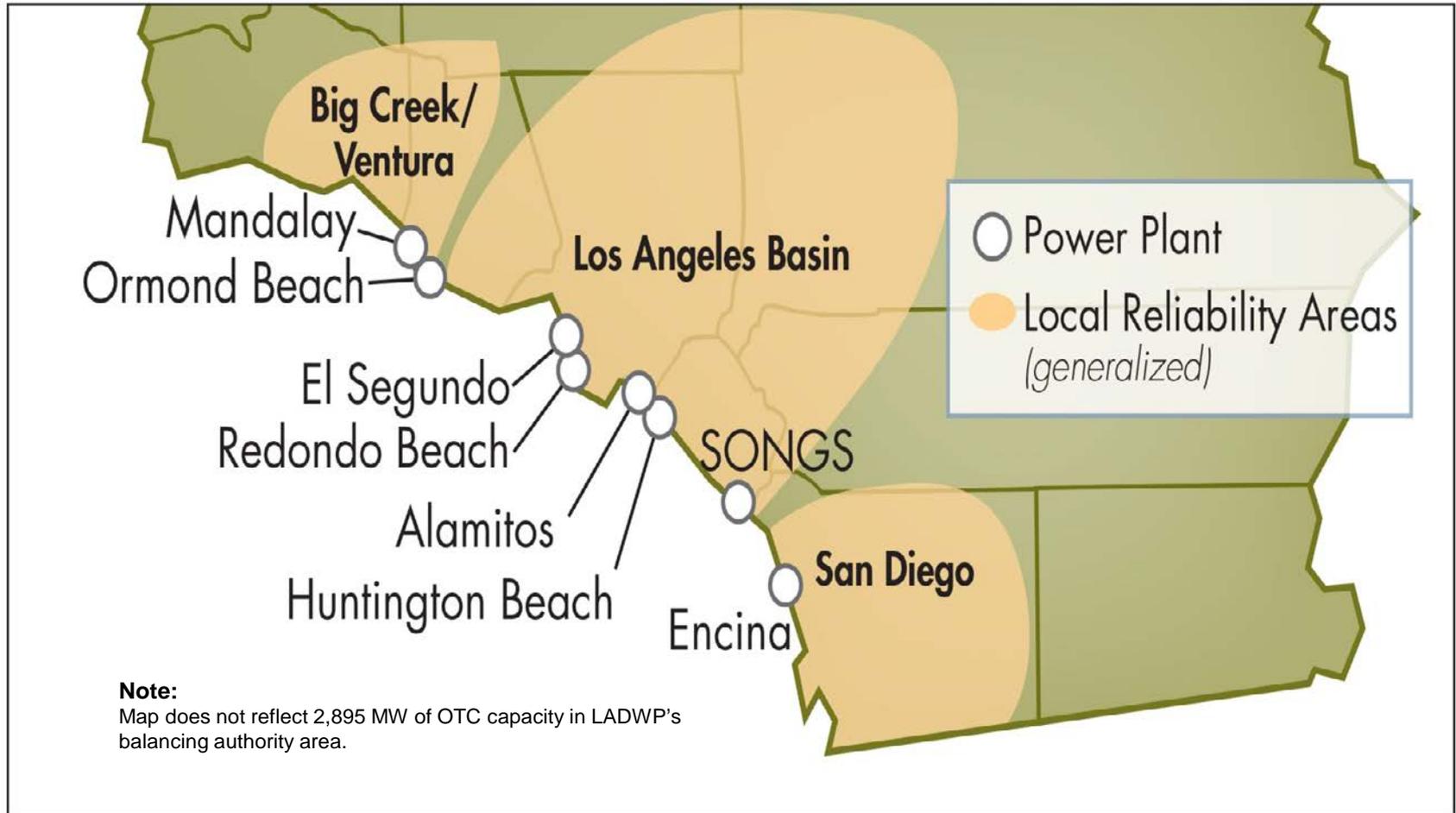
Ormond Beach (2020)

- Consists of two steam boiler units with total combined capacity of 1,486 MW
- CPUC authorized 215-290 MW in area where Ormond Beach and Mandalay are located (i.e., Moorpark subarea)
- Settlement with SWRCB in October 2014 determined Track 1 compliance infeasible
- January 4, 2017, NRG confirmed its intent to retire the facility by its compliance date with no further operations
- SACCWIS does not recommend a change in compliance dates

Mandalay (2020)

- Units 1 & 2 use once-through cooling; 215 MW each
- NRG plan to meet December 31, 2020 OTC compliance
 - build 262 MW peaker to replace Units 1 & 2 with COD of June 1, 2020 (Puente Power Project)
 - filed AFC with CEC in April, 2015; filed application with VCAPCD for air permits in March, 2015 – all applications under review
 - Decision on PPA between SCE and Puente Power Project was issued in May 2016
 - NRG's January 4, 2017 implementation plan confirmed that it is on track to achieve commercial operation by June 2020.
 - ISO modeling 262 MW project as well as 12.5 MW of preferred resources to replace Mandalay and Ormond Beach generation
 - NRG stated that it is on track to achieve commercial operation by June 2020.
- SACCWIS does not recommend a change in compliance dates

Los Angeles Basin and San Diego Local Capacity Areas



Encina (2017)

- Consists of five steam boiler generating units using once-through cooling with an aggregate capacity of 950 MW.
- May 21, 2015, the CPUC approved 500 MW of the 600 MW originally requested - allocated remaining 100 MW to preferred or energy storage
- November 2015 CEC approved 600 MW Carlsbad Energy Center Project
- November 2015 appeals were filed. The First District Court of Appeal ruled on December 1, 2016 to affirm the original CPUC decision
- Given this legal delay, NRG's commercial operation date of Carlsbad Energy Center has changed to fourth quarter of 2018
- February 23, 2017, SACCWIS adopted report recommending the SWRCB defer the once-through cooling compliance date from December 31, 2017 to December 31, 2018.
- SACCWIS report presented to the SWRCB on March 21, 2017
- Public hearing and adoption planned for August with OAL approval in December 2017

Redondo Beach (2020)

- Consists of four units; total capacity is approximately 1,300 MW
- Proposed repowering project is a natural-gas fired, combined-cycle, air-cooled electrical generating facility with net generating capacity of 496 MW
- AFC suspended November 2015
- Unit 7 is scheduled to shut down October 31, 2019 in advance of the OTC Policy compliance date
- Units 5, 6, and 8 are scheduled to shutdown December 31, 2020 on the OTC Policy compliance date.
- ISO 2015-16 TPP indicates that potential delay of Mesa Loop-In to 2021 could result in need for temporary extension of Redondo Beach or Alamitos compliance
 - In the event of a potential delay, further study is needed
- SACCWIS does not recommend a change in compliance dates

Alamitos (2020)

- Six units with a total capacity of approximately 2,000 MW and an OTC compliance date of December 31, 2020
- November 2014 AES awarded 640 MW PPA with SCE
 - Units 1, 2, and 6 are contracted through December 31, 2019 and are expected to shut down earlier than the OTC compliance date
 - Units 3, 4, and 5 will likely operate through at least December 31, 2020
- April 12, 2017 Application for Certification (AFC) was approved by the CEC
- AES indicates target approval and issuance of a license and permit to construct by the CEC and SCAQMD by May 1, 2017
- ISO 2015-16 TPP indicates that potential delay of Mesa Loop-In to 2021 could result in need for temporary extension of Redondo Beach or Alamitos compliance
 - In the event of a potential delay, further study is needed
- SACCWIS does not recommend a change in compliance dates at this time

Huntington Beach (2020)

- Units 3 and 4
 - Retired October 31, 2012 and converted to synchronous condensers to provide voltage support in 2013
 - Both contracted through December 31, 2017, at which time both will be shut down and retired.
- Units 1 and 2
 - Capacity of 226 MW with an OTC Policy compliance date of December 31, 2020.
 - RA contract has been executed that would extend the operation of Huntington Beach units 1 and 2 through December 31, 2019 and December 31, 2020 respectively
 - Will be shut down and permanently retired at those contract end dates
- Petition to Amend (PTA) was approved by the CEC on April 12, 2017.
- Repowering project - Awarded a PPA for 644 MW capacity with a planned commercial online date of March 2020 - full Energy Commission approved the revised project April 12, 2017
- SACCWIS does not recommend a change in compliance date at this time

Conclusions

- No additional recommendations for compliance date changes beyond Encina are proposed at this time.
- ISO and CPUC have authorized resources to ensure reliability.
- ISO, CEC, and CPUC will continue to monitor developments and perform additional analyses with most recent data available to ensure reliability.
 - To the extent that any proposed plans don't come to pass, staff is evaluating timelines necessary to form a contingency, which could be procuring new resources or deferring existing deadlines.
- The Water Board should recognize that it may be necessary to modify final compliance dates for some generating units.