

Overview of 2019 Report of the Statewide Advisory Committee on Cooling Water Intake Structures

Prepared by the Inter-Agency Working Group

SACCWIS Meeting

March 8, 2019

Once-Through Cooling (OTC) Progress and Reliability Assessment

- No changes are recommended for the OTC Policy compliance schedule at this time
 - Continue to assess need to extend compliance date for Alamitos [or Redondo Beach]
 - Recommendation to SACCWIS by Summer 2019
- Resource, infrastructure, and reliability needs are continually assessed by:
 - California Public Utilities Commission (CPUC)
 - California Independent System Operators (CAISO)
 - California Energy Commission (CEC)

Status of OTC Plants

- 10 plants have achieved compliance - some early
- 6 plants are on track to achieve compliance
- 2 replacement plant projects are under construction
- 1 plant has announced plans to retire

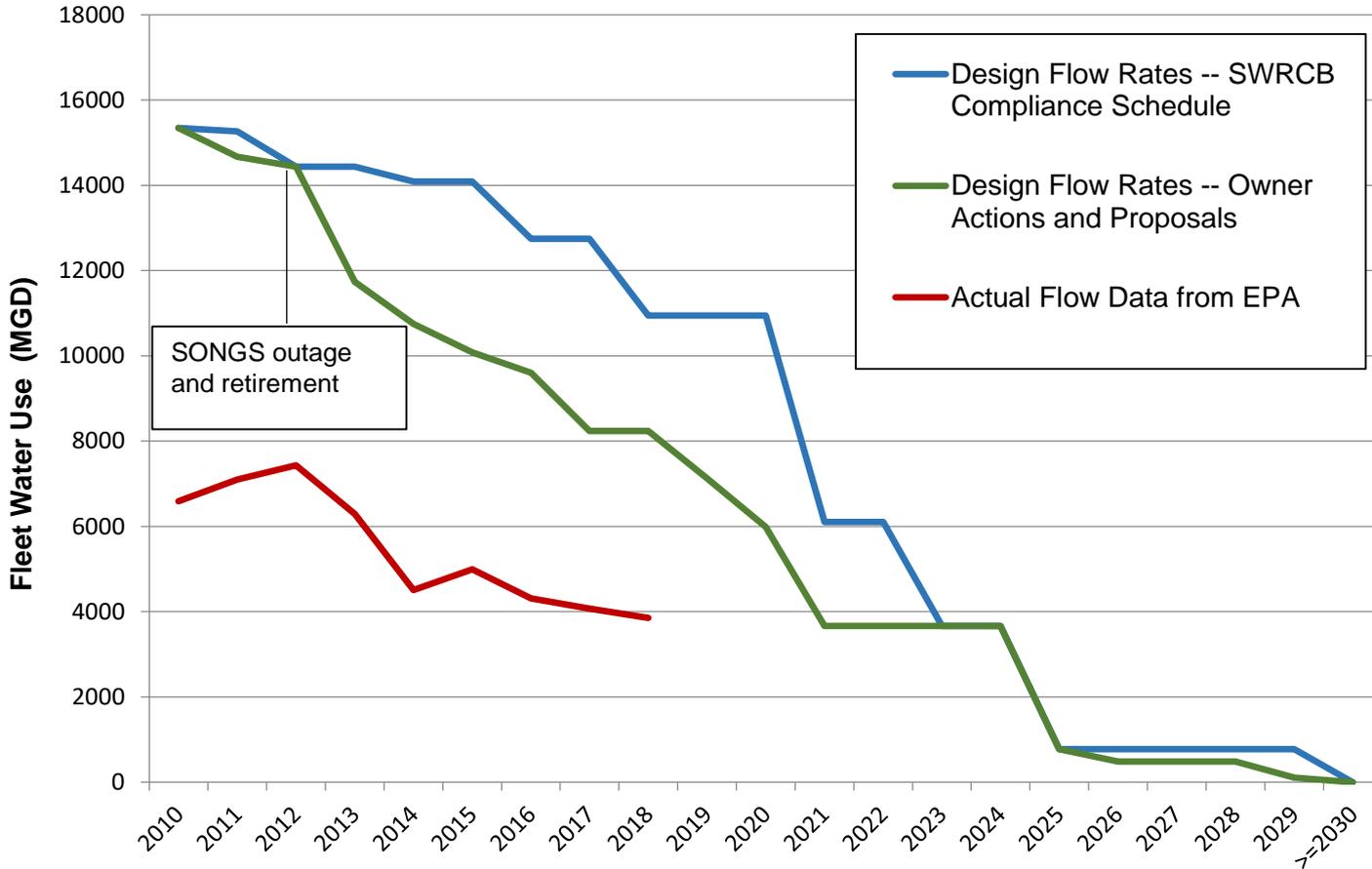
Once-Through Cooling Compliance Achievement

| Facility & Units | NQC (MW) | 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 1 | 106 | Dec 31, 2017 | Retired March 1, 2017 |
| Mandalay 1, 2 | 430 | Dec 31, 2020 | Retired February 6, 2018 |
| Encina 2-5 | 844 | December 31, 2018 | Retired December 11, 2018 |
| Total | 10,409 | - | - |

Once-Through Cooling Compliance Plans for Remaining Units

| Facility & Units | NQC | Compliance Date | Owner proposed Compliance Method |
|-----------------------|--------------|-----------------|---|
| Alamitos 1,2,6 | 848 | Dec. 31, 2020 | Plans to retire on Dec.31, 2019 to allow Alamitos be repowered |
| Alamitos 3,4,5 | 1,163 | Dec. 31, 2020 | Retire units |
| Harbor 5 | 229 | Dec. 31, 2029 | Plans to repower by Dec.31,2029 |
| Haynes 1, 2 | 444 | Dec. 31, 2029 | Plans to repower by Dec.31,2025 |
| Haynes 8 | 575 | Dec. 31, 2029 | Plans to repower by Dec. 31, 2028 |
| Huntington Beach 1 | 215 | Dec. 31, 2020 | Plans to retire on October 31, 2019 |
| Huntington Beach 2 | 215 | Dec. 31, 2020 | Retire unit |
| Moss Landing 1, 2 | 1,020 | Dec. 31, 2020 | Track 2 |
| Ormond Beach 1, 2 | 1,516 | Dec. 31, 2020 | Retire Units |
| Redondo Beach 7 | 493 | Dec. 31, 2020 | Plans to retire on Oct 31, 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 31,2024 |
| Total Capacity | 7,933 | - | - |

Historic and Projected Water Usage Combined OTC Fleet



Source: CEC and SWRCB Staff

Resources to Replace OTC

- Preferred resources
 - Energy efficiency
 - Demand response
 - Distributed generation
 - Energy storage
- Transmission solutions
 - Reactive support (e.g., synchronous generators)
 - Transmission lines and grid upgrades
- Conventional generation

CEC Actions

- Alamitos and Huntington Beach – Application for Certifications (AFC) were approved on April 12, 2017.
 - Approximately 50 percent complete and on track for an April 2020 completion
- Stanton Energy Reliability Center – AFC was approved on November 7, 2018
- Redondo Beach – AFC is currently suspended.
- NRG Puente – AFC was withdrawn by NRG on December 7, 2018.

CPUC Actions

- Approved contracts for a total of 2,087 MW of capacity in Southern California Edison (SCE) territory
 - 1,644 MW of gas fired generation
 - 443 MW of preferred resources and energy storage
- Approved 500 MW re-power of Encina Power Station in San Diego Gas & Electric (SDG&E) territory
- Operational 300 MW from Pio Pico in SDG&E territory

CAISO Actions

- Continued facilitation of Board Approved Transmission Projects
 - Sycamore-Penasquitos 230 kV Transmission line in service 8/29/2018
 - San Onofre Synchronous Condensers in service 8/16/2018
 - Mesa Loop-In Project expected March 2022
- The Draft 2018-2019 Transmission Plan (TPP) 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 CAISO's 2019 Local Capacity Technical Analysis was posted on May 1, 2018, and submitted to the State Water Resources Control Board.

Mesa Loop-In Project

- The project operational date is at risk of a delay
 - Construction commenced on November 15, 2017
 - Project is needed by June 1, 2021
 - Current schedule forecasts March 2022 in-service date
- CAISO will complete a study by Summer 2019 to assess need for Alamitos [or Redondo Beach] OTC compliance date extension to meet local capacity need in the LA Basin until the Mesa Loop-In project is in service.

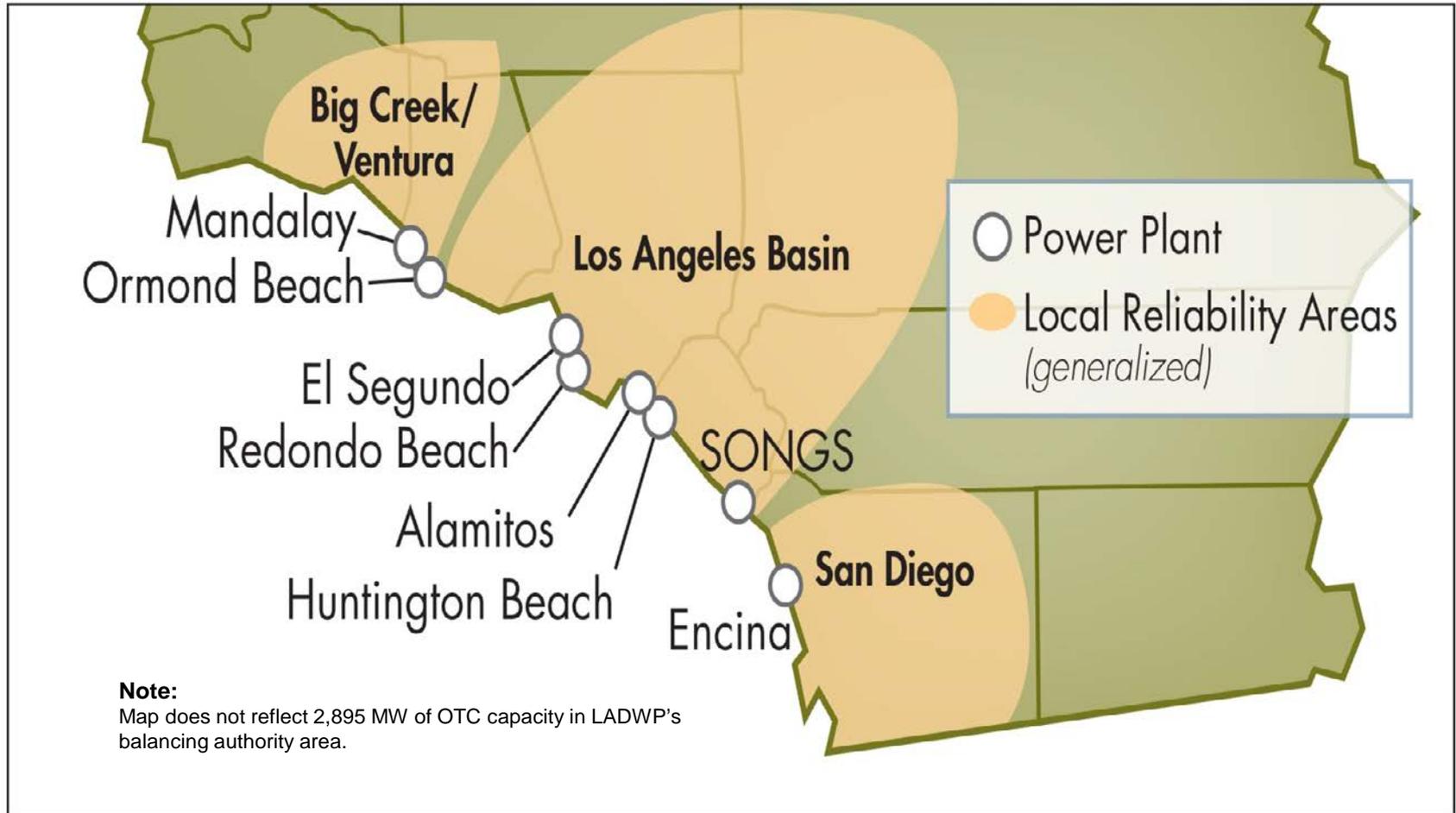
Moss Landing (2017, 2020)

- Moss Landing is single largest power generating facility in CA
 - Units 6 & 7 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
 - Installation of Supplemental Control Technology is expected to occur during scheduled maintenance outages for Units 1 and 2 (no dual unit outages anticipated).
 - Track 2 is not expected to impact operating range in MW of units or maximum achievable capacity factor.
- 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
- February 28, 2018 - NRG notified CPUC of its intention to shut down and retire Ormond Beach by October 1, 2018.
- ISO 2019 Local Capacity Technical Analysis identified need for at least one unit to meet local capacity requirements.
- CPUC Decision directed SCE to contract with Ormond through 2020
 - January 1 – November 30, 2019 contract approved by CPUC on September 26, 2018
 - December 1, 2019 – December 31, 2020 contract under review
- NRG intends to retire the two OTC units by its compliance date with no further operations
 - The need for one Ormond Beach unit will be mitigated after the Moorpark-Pardee #4 230 kV transmission project is in service, currently scheduled for December 31, 2020.
- SACCWIS does not recommend a change in compliance dates

Los Angeles Basin and San Diego Local Capacity Areas



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
 - AES has sold two parcels of the Redondo Beach site
 - If expected sale of remaining property closes in 2019, AES will terminate AFC
- Unit 7 scheduled to shut down Sept. 30, 2019 in advance of the OTC compliance date to accommodate emission offsets for new Huntington Beach combined-cycle gas turbine (CCGT)
- Units 5, 6, and 8 are scheduled to shutdown December 31, 2020, on the OTC Policy compliance date.
- SACCWIS does not recommend a change in compliance dates at this time, but the CAISO will evaluate need for potential OTC compliance date extension due to delay of the Mesa Loop-In Project and viability of extending OTC compliance date at Alamitos

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 Power Purchase Agreement with SCE
 - Units 1, 2, and 6 are expected to be retired early on December 31, 2019
 - Units 3, 4, and 5 are expected to retire by December 31, 2020 compliance date
- April 12, 2017 AFC was approved by the CEC
- Construction is underway and on track to be online April 2020.
- SACCWIS does not recommend a change in compliance dates at this time, but the CAISO will evaluate need for potential OTC compliance date extension due to delay of the Mesa Loop-In Project

Huntington Beach (2020)

- Units 3 and 4
 - Retired October 31, 2012 and converted to synchronous condensers to provide voltage support in 2013
 - Both synchronous condensers shut down and retired on December 31, 2017
- Units 1 and 2
 - Capacity of 226 MW each with an OTC Policy compliance date of December 31, 2020.
 - Resource Adequacy (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
- Repowering project - Awarded a PPA for 644 MW capacity with a planned initial delivery date of May 1, 2020
- Petition to Amend (PTA) was approved by the CEC on April 12, 2017.
- Construction is underway and on track to be online April 2020
- SACCWIS does not recommend a change in compliance date at this time

Conclusions

- No additional recommendations for compliance date are proposed at this time.
- CAISO and CPUC have authorized resources to ensure reliability.
- CAISO, CEC, and CPUC will continue to monitor developments and perform additional analyses with most recent data available to ensure reliability.
- The State Water Board should recognize that it may be necessary to modify final compliance dates for some generating units.
 - Mesa Loop-In Substation Project being closely monitored
 - CAISO will complete study by Summer 2019 to assess need for Alamitos [or Redondo Beach] OTC compliance date extension