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

<table>
<thead>
<tr>
<th>Facility &amp; Units</th>
<th>NQC (MW)</th>
<th>Compliance Date</th>
<th>Retirement Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humboldt Bay 1, 2</td>
<td>135</td>
<td>Dec. 31, 2010</td>
<td>Retired Sept. 30, 2010</td>
</tr>
<tr>
<td>Huntington Beach 3, 4</td>
<td>452</td>
<td>Dec. 31, 2020</td>
<td>Retired Nov. 1, 2012</td>
</tr>
<tr>
<td>Contra Costa 6, 7</td>
<td>674</td>
<td>Dec. 31, 2017</td>
<td>Retired April 30, 2013</td>
</tr>
<tr>
<td>San Onofre 2, 3</td>
<td>2,246</td>
<td>Dec. 31, 2022</td>
<td>Retired June 7, 2013</td>
</tr>
<tr>
<td>Moss Landing 6, 7</td>
<td>1,509</td>
<td>Dec. 31, 2020</td>
<td>Retired January 1, 2017</td>
</tr>
<tr>
<td>Encina 1</td>
<td>106</td>
<td>Dec 31, 2017</td>
<td>Retired March 1, 2017</td>
</tr>
<tr>
<td>Mandalay 1, 2</td>
<td>430</td>
<td>Dec 31, 2020</td>
<td>Retired February 6, 2018</td>
</tr>
<tr>
<td>Encina 2-5</td>
<td>844</td>
<td>December 31, 2018</td>
<td>Retired December 11, 2018</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10,409</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Once-Through Cooling Compliance Plans for Remaining Units

<table>
<thead>
<tr>
<th>Facility &amp; Units</th>
<th>NQC</th>
<th>Compliance Date</th>
<th>Owner proposed Compliance Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alamitos 1,2,6</td>
<td>848</td>
<td>Dec. 31, 2020</td>
<td>Plans to retire on Dec. 31, 2019 to allow Alamitos be repowered</td>
</tr>
<tr>
<td>Alamitos 3,4,5</td>
<td>1,163</td>
<td>Dec. 31, 2020</td>
<td>Retire units</td>
</tr>
<tr>
<td>Harbor 5</td>
<td>229</td>
<td>Dec. 31, 2029</td>
<td>Plans to repower by Dec. 31, 2029</td>
</tr>
<tr>
<td>Haynes 1, 2</td>
<td>444</td>
<td>Dec. 31, 2029</td>
<td>Plans to repower by Dec. 31, 2025</td>
</tr>
<tr>
<td>Haynes 8</td>
<td>575</td>
<td>Dec. 31, 2029</td>
<td>Plans to repower by Dec. 31, 2028</td>
</tr>
<tr>
<td>Huntington Beach 1</td>
<td>215</td>
<td>Dec. 31, 2020</td>
<td>Plans to retire on October 31, 2019</td>
</tr>
<tr>
<td>Huntington Beach 2</td>
<td>215</td>
<td>Dec. 31, 2020</td>
<td>Retire unit</td>
</tr>
<tr>
<td>Moss Landing 1, 2</td>
<td>1,020</td>
<td>Dec. 31, 2020</td>
<td>Track 2</td>
</tr>
<tr>
<td>Ormond Beach 1, 2</td>
<td>1,516</td>
<td>Dec. 31, 2020</td>
<td>Retire Units</td>
</tr>
<tr>
<td>Redondo Beach 7</td>
<td>493</td>
<td>Dec. 31, 2020</td>
<td>Plans to retire on Oct 31, 2019 to allow Huntington Beach repower</td>
</tr>
<tr>
<td>Redondo Beach 5,6,8</td>
<td>848</td>
<td>Dec. 31, 2020</td>
<td>Retire units</td>
</tr>
<tr>
<td>Scattergood 1, 2</td>
<td>367</td>
<td>Dec. 31, 2024</td>
<td>Plans to repower by Dec 31, 2024</td>
</tr>
<tr>
<td><strong>Total Capacity</strong></td>
<td>7,933</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
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

Note: Map does not reflect 2,895 MW of OTC capacity in LADWP’s balancing authority area.
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
  – 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