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

<table>
<thead>
<tr>
<th>Facility &amp; Units</th>
<th>NQC</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 Unit 1</td>
<td>106</td>
<td>Dec 31, 2017</td>
<td>Retired March 1, 2017</td>
</tr>
</tbody>
</table>

*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

<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 1,2,5</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 3,4,6</td>
<td>1,163</td>
<td>Dec. 31, 2020</td>
<td>Retire units</td>
</tr>
<tr>
<td>Encina Units 2-5</td>
<td>844</td>
<td>Dec. 31, 2017 *</td>
<td>Retire units by compliance date</td>
</tr>
<tr>
<td>Harbor 5</td>
<td>229</td>
<td>Dec. 31, 2029</td>
<td>Plans to repower on Dec.31, 2026</td>
</tr>
<tr>
<td>Haynes 1, 2</td>
<td>444</td>
<td>Dec. 31, 2029</td>
<td>Plans to repower on Dec.31, 2023</td>
</tr>
<tr>
<td>Haynes 8</td>
<td>575</td>
<td>Dec. 31, 2029</td>
<td>Plans to repower on Dec. 31, 2029</td>
</tr>
<tr>
<td>Huntington Beach 1</td>
<td>215</td>
<td>Dec. 31, 2020</td>
<td>Plans to retire on Dec. 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>Mandalay 1, 2</td>
<td>430</td>
<td>Dec. 31, 2020</td>
<td>Repower with 262 MW Puente Power Project</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 7</td>
<td>493</td>
<td>Dec. 31, 2020</td>
<td>Plans to retire on Oct 1, 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, 2020</td>
</tr>
</tbody>
</table>

* 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

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