



# California Energy Commission

## Experience with

# Power Plant Licensing and

# Once-Through Cooling

Presentation to the State Water Resources Control  
Board for September 26<sup>th</sup> 316(b) Workshop

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# CEC Authorities

- **Power Plant Licensing Authority**
  - Warren-Alquist Act of 1974 (PRC§25500)
    - Licensing authority for thermal power plants greater than 50 MW or repowers with net capacity increases of 50 MW or greater
- **Energy Policy Development**
  - SB 1389 (Bowen, 2002) (PRC§25300)
    - Directs the Energy Commission to “to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety.”
- **Public Interest Energy Research Program (PIER)**
  - Administers \$60 million annual electrical energy research program
- **All Statutes Require Balancing Energy Supplies, Reliability, Costs and Environmental Protection**



# Coastal Power Plants, Once-Through Cooling (OTC), and Repowering

- 21 Existing Power Plants Totaling 23,883 MW Use OTC
  - 39% of California's total generation capacity, 53% of natural gas-fired capacity, 100% of nuclear capacity
  - Permitted to withdraw 17 billion gallons per day
- 5 Plants Have Sought Repowering Licenses Since 1999
  - Energy Commission and other agencies had to develop new approaches
  - Data collection and analysis is expensive, time-consuming, and problematic
    - No consensus on standards and justification for current data
    - Most repower cases pre-dated 2004 US EPA 316(b) regulations
  - Commission has required off-site mitigation, in lieu of impact reduction
- Widespread Problem of Entrainment Impacts to Near-Shore / Estuarine Ecosystems Requires a Comprehensive, Collaborative Approach
  - Repowering of selected facilities under Warren-Alquist Act results in piecemeal approach to once-through cooling issues



# Summary of 5 Repowering Cases

Power Plant and Location	New Capacity (MW)	Licensing Dates & Permitting Time	New Entrainment Studies?	Mitigation / Enhancement	Status
Moss Landing <i>Elkhorn Slough</i>	1060	Oct 2000 <i>19 months</i>	Yes	\$7 million watershed enhancement to Elkhorn Slough Foundation. \$.4 million thermal study	Operational July 2002
Potrero 7 <i>SF Bay</i>	540	Nov 2003 <i>42 months</i>	Yes	Not Applicable	Application Suspended Not Constructed
Morro Bay <i>Morro Bay Estuary</i>	1200	Aug 2004 <i>47 months</i>	Yes	\$12.5 million to Central Coast Regional Water Board	License Issued
El Segundo <i>Santa Monica Bay</i>	630	Feb 2005 <i>50 months</i>	No	\$5 million for studies and "enhancement" to Santa Monica Bay Restoration Commission	License Issued
Huntington Beach	500	May 2001 <i>6 months</i>	Yes	CEQA assessment ongoing. Mitigation TBD	Operational July 2002



# CEC Staff and Commission Products

- Coastal Power Plant Inventory – 2000 Internal Staff Report
- Environmental Performance Reports – 2001, '03, & '05
  - Identify Once-Through Cooling as significant environmental issue
- “Gap Analysis” of Existing 316 (a) & (b) Data / Studies for All Coastal Plants - 2004
  - *Dr. Michael Foster, Moss Landing Marine Labs*
- Once-Through Cooling White Paper – 2005
  - Summary of CEC work on OTC issues for Integrated Energy Policy Report
  - *Rick York and Dr. Michael Foster*
- Draft Protocol for Entrainment Impact Analyses
  - *John Steinbeck, Dr. Peter Raimondi, Dr. Gregor Cailliet, John Hedgpeth*
- Alternative Cooling Report (2003) and Workshop (2005) – PIER
- 2005 PIER Research Grant to Moss Landing Marine Labs
- 2005 Policy Statement in Draft Integrated Energy Policy Report



# Summary of Issues and Recommendations to SWB and 316(b) Team

- Once-Through Cooling is a Major, Ongoing Environmental Issue with California Power Plants
  - Contributing factor to degraded marine & estuarine ecosystems
  - Cumulative effects potentially widespread in Santa Monica Bay and SF Bay-Delta Estuary
- Impact Assessment, Reduction and Mitigation
  - Require sound science, uniform study protocols, agency cooperation, consistent regulatory approach, and ongoing research
- Few of Remaining 16 Coastal Plants Expected to Come Before Commission
- CEC Staff Seeks to Work Collaboratively with Staff from State and Regional Boards and Other Agencies
  - Cumulative impact analyses in key bays and estuaries
  - Standards for 316(b) permit renewals



# Energy Commission Policy Recommendations to Governor and Legislature in Draft 2005 IEPR

1. “Once-Through Cooling can contribute to declining fisheries and the degradation of estuaries, bay and coastal waters.”
2. Energy Commission recommends working collaboratively with agencies on OTC through the Ocean Protection Council
3. PIER should continue research on impact assessment protocols, impact reduction and alternatives to OTC
4. Commission should update its MOA with SWB, RWBs and Coastal Commission to develop consistent regulatory approaches, including investigating retrofit control technologies (BARCT)
5. Commission Staff will update Data Adequacy Regulations for License Applications and for Calif. Coastal Act consistency.



# PIER Funding

- PIER environmental area program mission is to study and minimize environmental effects from electricity production, delivery and use.
- PIER has established a research agreement with the Moss Landing Research Lab
  - To conduct research that supports the development and application of methods and technologies for assessing and resolving negative effects from the use of once-through cooling technology
  - To fund research that results in a benefit to the public, and that would not adequately be addressed by the market



# Research Agreement

- \$1.5 million for research
- Timeline:
  - Solicitation letters for the Technical Advisory Committee will be sent shortly
  - The Request for Proposals (RFP) will be sent out after the TAC is formed
- We invite staff from the RWQCB/SWRCB to be involved so the research informs the regulatory process



# Potential Research Priorities

- Identification of new tools or technologies for detecting entrainment effects, such as new techniques to identify species that are entrained and new sampling methodologies for quantifying the spatial and temporal effects (including cumulative effects) of cooling water intake.
- Determination of when monitoring is needed and the design, frequency and duration of such efforts.
- Development and testing of criteria for the proper designation of indicator species to serve as proxies for monitoring of or detecting effects, as well as other tools or techniques that might make these efforts more accurate, more effective, and/or more cost efficient.
- Development and testing of measures, including both the addition of new technology and the modification of existing water intake practices, that can reduce the ecological effects of cooling water intake and discharge.



# References for CEC Reports

- *Issues and Environmental Impacts Associated with Once-Through Cooling at California's Coastal Power Plants*, Energy Commission Staff Report in support of the 2005 Integrated Energy Policy Report, York, Foster et al, June 2005, CEC pub. no. CEC-700-2005-013. <http://www.energy.ca.gov/2005publications/CEC-700-2005-013/CEC-700-2005-013.PDF>
- *An Assessment of the Studies Used to Detect Impacts to Marine Environments by California's Coastal Power Plants Using Once-Through Cooling*, Appendix A to *Issues and Environmental Impacts* Staff Report, Dr. Michael Foster, June 2005, CEC pub. No. CEC-700-2005-13-AP-A. <http://www.energy.ca.gov/2005publications/CEC-700-2005-013/CEC-700-2005-013-AP-A.PDF>
- *Intake Structure Entrainment Study Design and Analyses*, Steinbeck, J.R., Raimondi, P. & Cailliet, G.M., California Energy Commission Consultant Report (in prep.).
- *Research on Estimating the Environmental Benefits of Restoration to Mitigate or Avoid Environmental Impacts Caused by California Power Plant Cooling Water Intake Structures*. Strange, E., Allen, D., Mills, D. & Raimondi, P., 2004 California Energy Commission PIER final project report, Report 500-04-092. [http://www.energy.ca.gov/pier/final\\_project\\_reports/CEC-500-2004-092.html](http://www.energy.ca.gov/pier/final_project_reports/CEC-500-2004-092.html)
- *Comparison of Alternate Cooling Technologies for California Power Plants*, Energy Commission PIER Consultant Report, February 2003, Report P500-02-079F. [http://www.energy.ca.gov/pier/final\\_project\\_reports/500-02-079f.html](http://www.energy.ca.gov/pier/final_project_reports/500-02-079f.html)



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