

**THERMAL ENERGY STORAGE (TES) SYSTEM ACCEPTANCE**

CEC-MECH-15A (Revised 07/10)

CALIFORNIA ENERGY COMMISSION



<b>CERTIFICATE OF ACCEPTANCE</b>		<b>MECH-15A</b>
<b>NA7.5.14 Thermal Energy Storage (TES) System Acceptance</b>		<b>(Page 1 of 4)</b>
Project Name/Address:		
System Name or Identification/Tag:	System Location or Area Served:	
Enforcement Agency:	Permit Number:	
<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date	

**FIELD TECHNICIAN'S DECLARATION STATEMENT**

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am the person who performed the acceptance requirements verification reported on this Certificate of Acceptance (Field Technician).
- I certify that the construction/installation identified on this form complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
- I have confirmed that the Installation Certificate(s) for the construction/installation identified on this form has been completed and is posted or made available with the building permit(s) issued for the building.

Company Name:		
Field Technician's Name:	Field Technician's Signature:	
	Date Signed:	Position With Company (Title):

**RESPONSIBLE PERSON'S DECLARATION STATEMENT**

- I certify under penalty of perjury, under the laws of the State of California, that I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this form.
- I am a licensed contractor, architect, or engineer, who is eligible under Division 3 of the Business and Professions Code, in the applicable classification, to take responsibility for the scope of work specified on this document and attest to the declarations in this statement (responsible person).
- I certify that the information provided on this form substantiates that the construction/installation identified on this form complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
- I have confirmed that the Installation Certificate(s) for the construction/installation identified on this form has been completed and is posted or made available with the building permit(s) issued for the building.
- I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Company Name:		Phone:
Responsible Person's Name:	Responsible Person's Signature:	
License:	Date Signed:	Position With Company (Title):

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**Intent:** Verify proper operation of distributed energy storage TES systems.

### Construction Inspection

1. Instrumentation to perform test includes, but not limited to:
  - a. No special instrumentation is required for the acceptance tests.

### A. Certificate of Compliance Information

*The following Certificate of Compliance information for both the chiller and the storage tank shall be provided on the plans to document the key TES System parameters and allow plan check comparison to the inputs used in the DOE-2 simulation. DOE-2 keywords are shown in ALL CAPITALS in parentheses.*

<b>a. Chiller</b>	Brand and Model:			
	Type (Centrifugal, Reciprocating, etc):			
	Capacity (tons): (Size)			
	Starting Efficiency (kW/ton): (at beginning of ice production) (COMP-KW/TON-START)			
	Ending Efficiency (kW/ton): (at end of ice production) (COMP-KW/TON-END)			
	Capacity Reduction (% / F): (PER-COMP-REDUCT/F)			
<b>b. Storage Tank</b>	Storage Type (Check): (TES-TYPE)	<input type="checkbox"/> Chilled Water Storage	<input type="checkbox"/> Ice-on-Coil	<input type="checkbox"/> CHS
		<input type="checkbox"/> Ice Harvester	<input type="checkbox"/> Brine	
		<input type="checkbox"/> Ice-Slurry	<input type="checkbox"/> Eutectic Salt	
	Number of tanks (SIZE)			
	Storage Capacity per Tank (ton-hours)			
	Storage Rate (tons): (COOL-STORE-RATE)			
	Discharge Rate (tons): (COOL-SUPPLY-RATE)			
	Auxiliary Power (watts): (PUMP+AUX-KW)			
	Tank Area (sq ft): (CTANK-LOSS-COEFF)			
	Tank Insulation (R-Value): (CTANK-LOSS-COEFF)			

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<b>B. Functional Testing</b>	<b>Results</b>
<b>Step 1: TES System Design Verification</b>	
a. In the TES System Design Verification part, the installing contractor shall certify the following information, which verifies proper installation of the TES System consistent with system design expectations:	Y / N
<input type="checkbox"/> The TES system is one of the above eligible systems <input type="checkbox"/> Initial discharge rate of the storage tanks (tons) <input type="checkbox"/> Discharge test time (hrs).	
<input type="checkbox"/> Initial charge rate of the storage tanks (tons) <input type="checkbox"/> Final discharge rate of the storage tank (tons) <input type="checkbox"/> Tank storage capacity after charge (ton-hrs)	
<input type="checkbox"/> Final charge rate of the storage tank (tons) <input type="checkbox"/> Charge test time (hrs) <input type="checkbox"/> Tank storage capacity after discharge (ton-hrs)	
<input type="checkbox"/> Tank standby storage losses (UA) <input type="checkbox"/> Initial chiller efficiency (kW/ton) during charging <input type="checkbox"/> Final chiller efficiency (kW/ton) during charging	
<b>Step 2: TES System Controls and Operation Verification</b>	
a. The TES system and the chilled water plant is controlled and monitored by an EMS.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
b. Force the time between 9:00 p.m. and 9:00 a.m. and simulate a partial or no charge of the tank and simulate no cooling load by setting the indoor temperature setpoint higher than the ambient temperature. Verify that the TES system starts charging (storing energy).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
c. Force the time to be between 6:00 p.m. and 9:00 p.m. and simulate a partial charge on the tank and simulate a cooling load by setting the indoor temperature set point lower than the ambient temperature. Verify that the TES system starts discharging.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
d. Force the time to be between noon and 6:00 p.m. and simulate a cooling load by lowering the indoor air temperature set point below the ambient temperature. Verify that the tank starts discharging and the compressor is off. For systems designed to meet partial loads the system should be run until the TES storage is fully depleted. The number of hours of operation must meet or exceed the designed operational hours for the system.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
e. Force the time to be between 9:00 a.m. to noon, and simulate a cooling load by lowering the indoor air temperature set point below the ambient temperature. Verify that the tank does not discharge and the cooling load is met by the compressor only.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
f. Force the time to be between 9:00 p.m. and 9:00 a.m. and simulate a full tank charge by changing the output of the sensor to the EMS. Verify that the tank charging is stopped.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
g. Force the time to be between noon and 6:00 p.m. and simulate no cooling load by setting the indoor temperature set point above the ambient temperature. Verify that the tank does not discharge and the compressor is off.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
<b>C . PASS / FAIL Evaluation (check one):</b>	
<input type="checkbox"/> PASS: Construction Inspection responses are complete and all tests in step 2 pass.	
<input type="checkbox"/> FAIL: Any <b>Construction Inspection</b> responses are incomplete <i>OR</i> there is one or more "Fail" responses in <b>Testing Results</b> section. Provide explanation below. Use and attach additional pages if necessary.	

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