

THERMAL ENERGY STORAGE (TES) SYSTEM ACCEPTANCE

CEC-NRCA-MCH-15-A (Revised 01/19)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-15-A
Thermal Energy Storage (TES) System Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
System Name or Identification/Tag:	System Location or Area Served:	

Compliance Results: AUTOMATED ("Complies" or "Does Not Comply")	Enforcement Agency Use: Checked by/Date
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Intent:	This acceptance test is intended for Thermal Energy Storage (TES) Systems that are used in conjunction with chilled water air conditioning systems as limited under Construction Inspection 2: Eligibility Criteria (below). (NA7.5.14) Submit one Certificate of Acceptance for each system that must demonstrate compliance.
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A. Construction Inspection				
Building:	Floor:	Room/Area/Zone:	Control/System:	
1	Required Documentation (check all of the following): (NA7.5.14.1)			
<input type="checkbox"/>	a.	Designs, plans, schematics, and schedules as approved by the authority having jurisdiction.		
<input type="checkbox"/>	b.	Using a California Energy Commission approved compliance software; software inputs and output results for the TES system as approved by the authority having jurisdiction.		
<input type="checkbox"/>	c.	Manufacturer specifications or tear sheets for the installed TES system as available.		
2	Eligibility Criteria. ONLY the following types of TES systems are eligible for compliance credit (check one of the following): (NA7.5.14.1)			
<input type="checkbox"/>	a.	Chilled Water Storage (NA7.5.14.1(a))		
<input type="checkbox"/>	b.	Ice-on-Coil Internal Melt (NA7.5.14.1(b))		
<input type="checkbox"/>	c.	Ice-on-Coil External Melt (NA7.5.14.1(c))		
<input type="checkbox"/>	d.	Ice Harvester (NA7.5.14.1(d))		
<input type="checkbox"/>	e.	Brine (NA7.5.14.1(e))		
<input type="checkbox"/>	f.	Ice-Slurry (NA7.5.14.1(f))		
<input type="checkbox"/>	g.	Eutectic Salt (NA7.5.14.1(g))		
<input type="checkbox"/>	h.	Clathrate Hydrate Slurry (CHS) (NA7.5.14.1(h))		
<input type="checkbox"/>	i.	Cryogenic (NA7.5.14.1(i))		
<input type="checkbox"/>	j.	Encapsulated (e.g. Ice Balls) (NA7.5.14.1(j))		
3	Compare the following characteristics of the installed TES system with the Required Documentation from section 1b above (check all of the following): (NA7.5.14.1)			
	TES system Chiller		TES system Storage	
a.	<input type="checkbox"/>	Brand and Model (NA7.5.14.1(k))	<input type="checkbox"/>	Brand and Model (NA7.5.14.1(s))
b.	<input type="checkbox"/>	Type (Centrifugal, Reciprocating, Other) (NA7.5.14.1(l))	<input type="checkbox"/>	Number of Tanks (NA7.5.14.1(t))
c.	<input type="checkbox"/>	Heat Rejection Type (Air, Water, Other) (NA7.5.14.1(m))	<input type="checkbox"/>	Storage Capacity per Tank (ton-hours) (NA7.5.14.1(u))
d.	<input type="checkbox"/>	Charge Mode Capacity (Tons) (NA7.5.14.1(n))	<input type="checkbox"/>	Storage Rate (tons) (NA7.5.14.1(v))
e.	<input type="checkbox"/>	Discharge Mode Capacity (Tons) (NA7.5.14.1(o))	<input type="checkbox"/>	Minimum Charging Temperature (NA7.5.14.1(w))
f.	<input type="checkbox"/>	Discharge Mode Efficiency (kW/Ton or EER) (NA7.5.14.1(p))	<input type="checkbox"/>	Discharge Rate (tons) (NA7.5.14.1(x))
g.	<input type="checkbox"/>	Charge Mode Efficiency (kW/Ton or EER) (NA7.5.14.1(q))		
h.	<input type="checkbox"/>	Fluid Type and Percentage (NA7.5.14.1(r))		
Construction Inspection Compliance Results: AUTOMATED ("Complies" or "Does Not Comply")				

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B. Functional Testing			
Building:	Floor:	Room/Area/Zone:	Control/System:
Part 1	TES System Design Verification. (NA7.5.14.2 Part 1)		
Steps:			Results
1	Chiller(s) start-up procedure has been completed. (NA7.5.14.2(a))		P/F
2	System fluid test and balance has been completed. (NA7.5.14.2(b))		P/F
3	Air separation and purge has been completed. (NA7.5.14.2(c))		P/F
4	Fluid (e.g. glycol) has been verified at the concentration and type indicated on the design documents. (NA7.5.14.2(d))		P/F
5	The TES system has been fully charged at least once and the charge duration noted. (NA7.5.14.2(e))		P/F
6	The system has been partially discharged at least once and the discharge duration noted. (NA7.5.14.2(f))		P/F
7	The system is in a partial charge state in preparation for step 2 tests. (NA7.5.14.2(g))		P/F
8	The schedule of operation has been activated as designed. (NA7.5.14.2(h))		P/F
9	Mode documentation describes the state of system components in each mode of operation. (NA7.5.14.2(i))		P/F
Part 2	TES System Controls and Operation Verification. (NA7.5.14.2 Part 2)		
Steps:			Results
1	Verify that the TES system and the chilled water plant is controlled and monitored by an energy management system (EMS). (NA7.5.14.2(a))		P/F
2	Indicate one of the following methods of simulation that will be used during the test. Manual selection of each operating mode (M) or Use of an EMS by inputting the schedule as indicated by the designer or manufacturer (E). (NA7.5.14.2(b))		M/E
3	Storage/charge mode. Verify that the TES system stores energy. (NA7.5.14.2(c))		P/F
4	End of charge signal. Simulate a full storage charge by changing the (manufacturer recommended) thermal storage end of charge output sensor to the EMS. Verify that the storage charging has stopped. (NA7.5.14.2(d))		P/F
5	Discharge mode. Generate a call for cooling. Verify that the storage starts discharging with the compressors off. Return to the off/secured mode. (NA7.5.14.2(e))		P/F
6	Mechanical cooling only mode. Generate a call for cooling. Verify that the storage does not discharge and the cooling load is met by the compressor only. Return to the off/secure mode. (NA7.5.14.2(f))		P/F
7	Discharge and mechanical cooling mode. Generate a call for cooling. Verify that the TES system discharges with the compressor sharing the load. (NA7.5.14.2(g))		P/F
8	Off/storage-secured mode. Verify that the storage does not discharge and all compressors are off, regardless of the presence of calls for cooling. (NA7.5.14.2(h))		P/F
9	Charge plus cool mode. IF provisions for this mode have been made by the system designer THEN verify that the tank(s) can be charged while serving an active cooling load, ELSE verify that the energy storage is disallowed or discontinued while an active cooling load is present. (NA7.5.14.2(i))		P/F
Functional Testing Compliance Results: AUTOMATED ("Complies" or "Does Not Comply")			

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	ATT Certification Identification (If applicable):
City/State/Zip:	Phone:

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

- The information provided on this Certificate of Acceptance is true and correct.
- I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
- The construction or installation identified on this Certificate of Acceptance complies with the applicable 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 Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

- 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 Certificate of Acceptance.
- I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
- The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance 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 Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance 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.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed: