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Air-Conditioning, Heating, and Refrigeration Institute

October 31, 2011

California Energy Commission (CEC)

Re: October 13, 2011 Nonresidential Staff Workshop - 2013 Building Energy Efficiency Standards (AHRI Comments on Table 110.2-D Water Chilling Packages – Minimum Efficiency Requirements)

Dear CEC Staff:

The Air-Conditioning, Heating and Refrigeration Institute (AHRI) is the trade association representing manufacturers of heating, cooling, water heating, and commercial refrigeration equipment. Over 300 members strong, AHRI is an internationally recognized advocate for the industry, and develops standards for and certifies the performance of many of the products manufactured by our members. In North America, the annual output of the HVACR industry is worth more than $20 billion. In the United States alone, our members employ approximately 130,000 people, and support some 800,000 dealers, contractors, and technicians.

Slide 4 of the CEC staff presentation dated October 13, 2011 states that the efficiency table 110.2-D for water chilling packages was updated to match the ASHRAE 90.1 table. We compared both the tables and recommend that the following changes be made in order to satisfy CEC's original intent:

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TABLE 110.2-D WATER CHILLING PACKAGES – MINIMUM EFFICIENCY REQUIREMENTS [a,b]

Equipment Type	Size Category	Path A Efficiency	Path B Efficiency	Test Procedure[c]
Air- Cooled, With Condenser, Electrically Operated	< 150 Tons	≥9.562 EER ≥12.500 IPLV	N.A.[d]	AHRI 550/590
	≥ 150 Tons	~~3.05 IPLV~~ ≥9.562 EER ≥12.750 IPLV	N.A.[d]	
Air- Cooled, Without Condenser, Electrically Operated	All Capacities	Air-cooled chillers without condensers must be rated with matching condensers and comply with the air-cooled chiller efficiency requirements.		
Water- Cooled, Electrically Operated, Reciprocating ~~(Reciprocating)~~	All Capacities	Reciprocating units must comply with the water-cooled positive displacement efficiency requirements.		AHRI 550/590
Water -Cooled, Electrically Operated, Positive Displacement	< 75 Tons	≤0.780 kW/ton ≤0.630 IPLV	≤0.800 kW/ton ≤0.600 IPLV	AHRI 550/590
	≥ 75 tons and < 150 tons	≤0.775 kW/ton ≤0.615 IPLV	≤0.790 kW/ton ≤0.586 IPLV	
	≥ 150 tons and < 300 tons	≤0.680 kW/ton ≤0.580 IPLV	≤0.718 kW/ton ≤0.540 IPLV	
	≥ 300 Tons	≤0.620 kW/ton ≤0.540 IPLV	≤0.639 kW/ton ≤0.490 IPLV	
Water- Cooled, Electrically Operated, Centrifugal	< 150 Tons	≤0.634 kW/ton ≤0.596 IPLV	≤0.639 kW/ton ≤0.450 IPLV	
	≥ 150 tons and < 300 tons	≤0.634 kW/ton ≤0.596 IPLV	≤0.639 kW/ton ≤0.450 IPLV	
	≥ 300 tons and < 600 tons	≤0.576 kW/ton ≤0.549 IPLV	≤0.600 kW/ton ≤0.400 IPLV	
	≥ 600 Tons	≤0.570 kW/ton ≤0.539 IPLV	≤0.590 kW/ton ≤0.400 IPLV	

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Air- Cooled Absorption, Single Effect	All Capacities	≥0.600 COP	N.A. [d]	AHRI 560
Water-Cooled Absorption, Single Effect	All Capacities	≥0.700 COP	N.A. [d]	
Absorption Double-Effect, Indirect-Fired	All Capacities	≥1.000 COP ≥1.050 IPLV	N.A. [d]	
Absorption Double-Effect, Direct-Fired	All Capacities	≥1.000 COP ≥1.000 IPLV	N.A. [d]	
Water Cooled Gas Engine Driven Chiller	All Capacities	1.2 COP 2.0 IPLV		ANSI Z21.40.4

~~Table Footnotes:~~

[a] ~~a.~~ No requirements for:

- Centrifugal chillers with design leaving evaporator temperature (Tchws des) < 36 F
- Positive displacement chillers with design leaving fluid temperature (Tchws des) ~~<~~ ≤32F
- Absorption chillers with Tchws des < 40F

[b] ~~b.~~ Must meet both ~~COP~~ full load and IPLV of either path A or path B

[c] ~~c.~~ Ssee section 101 definitions

[d] ~~d.~~ NA means not applicable

~~e. NR means no minimum requirement in this field.~~

Lastly, all test procedure references need to be changed from ARI to AHRI. If you have any questions or wish to discuss this further, please do not hesitate to call me at (703) 600-0383.

Sincerely,

Aniruddh Roy
Regulatory Engineer
Air-Conditioning, Heating, and Refrigeration Institute

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