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Instructions for completing the Retrofit VARIABLE FREQUENCY DRIVE (VFD) Incentive Worksheet

General Notes:

- 1. A vendor proposal is required for an Incentive. The VFD Installation Information, page 3 may also be required.
- 2. VFDs offer a method of significantly reducing the energy consumed by fans, centrifugal pumps, and other motor-driven machinery operated under varying loads. For VFD applications not covered here, use the Custom Application.
- 3. Existing systems to be retrofit must have varying load operations such as variable flow or pressure regulation. Existing fan and pump operations using on/off cycling controls are not eligible for VFD Incentives. Systems with constant speed and variable load operation (such as conveyors) are not eligible for VFD Incentives.
- 4. Check with your specific utility for any harmonics or power quality requirements.
- 5. If power factor correction capacitors are present, they could be adversely affected by the VFD. The customer's design engineer should address this issue.
- 6. The Incentive, in conjunction with all other sources of funding, cannot exceed the total project cost.

Eligibility Requirements

- 1. Eligibility requirements can be found in the "Application Code" box in the back side of the Incentive form.
- 2. Existing VAV fans with inlet guide vanes and forward curve fan blades are not eligible for Incentives.
- 3. Fans / pumps motors must operate a minimum of 2,000 hours per year.
- 4. Applicants must demonstrate significant load diversity that will result in savings through motor speed variation.
- 5. The VFD speed must be automatically controlled by differential pressure, flow, temperature or other method.

VFD Installation Information Form

Check with your utility representative to determine if the attached <u>VFD Installation Information Form</u> needs to be completed and submitted.

Pre-Installation:

- 1. Review the Incentive eligibility requirements.
- 2. Review the proposed equipment specifications to confirm it meets the minimum efficiency requirements.
- 3. Provide to the utility representative the manufacturer's equipment specifications and confirm that it meets the minimum efficiency requirements
 - a. Motor HP (size) horsepower
 - b. Fan or Pump ID identification (example: AC-2, Air handler #2, Chilled water pump #1)
 - c. Area Served location (example: Lobby, Cafeteria, 2nd floor offices)
 - d. Fan or Pump Application Code (Table 1 on the VFD worksheet)
 - e. Verify the fan is not forward curve type.
 - f. Annual Hours of Operation

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If controlled horsepower falls between two listed values, interpolate to determine the Incentive.

Explanation of how to fill out table:

	RETROFIT VFD INCENTIVE WORKSHEET							
lte m	Motor HP	Fan or Pump ID	Area Served	Application Code ¹	Control Parameters ²	Motor Efficiency	Annual Hours of Operation ³	Incentive (\$) ⁴
Ex.	25	AC-3	Lobby	RFA	DT	91%	4,400	\$2,050
	Motor name plate	Equipment identificati on or name	Location of pump or fan	Refer to the Application Table 1 on Incentive Form	Refer to the Controls Parameter on Table 2 on Incentive Form	Refer to Manufacture's specifications	Must Exceed 2000 hrs.	Refer to the Incentive Table on Incentive Form

Post-Installation:

Utility Representative must verify that:

- 1. The equipment including the VFD, motor and line reactors has been installed and is operable.
- 2. The VFD equipment matches the Incentive application information. If the equipment has changed from what was approved for the initial Incentive offer, the substituted equipment/material specifications must be submitted and reviewed by the utility to verify compliance with technical requirements and approved before an Incentive is considered.
- 3. Verify that the prior control is disabled
 - a. inlet or outlet dampers are fully open or removed
 - b. inlet or outlet valves are fully open or removed, bypass loop valved off or removed
- 4. Observe operation of drive, motor, and driven equipment.
- 5. If possible, observe variation in drive speed with changing operating conditions.
- 6. The invoice or proof of payment has been submitted.
- 7. The Utility Representative & Customer have signed / dated the post installation inspection block on the Incentive form.

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VFD Installation Information Form

Equipment Information

Item ID reference number found in t	the incentive worksheet ta	able		
Fan or Pump ID(s)	(Exampl	e: FW-1, Feedwater Pum	p #1; CW-1, Condenser V	Nater Pump #1)
VFD Application:		(Use list of app	olications from page one, o	or describe other)
Building Type:		_ (Office, Hotel/Motel, He	althcare, Elementary/Higl	h School,
		College/University, War	rehouse, Restaurant, Mar	ufacturing, Other ?)
Type of area(s) served by fan(s) or Equipment served by the fan (s) or	pump(s): pump (s):			
If fan, note type:	(centrifugal, f	orward curve, backward o	curve, axial, etc)	
Fan or Pump Nominal HP	(if multiple mo	otors, list individual HP's)	Nameplate motor efficien	icy(s)
Fan or Pump Manufacturer:		Model:		
Full Load Design Conditions: Flow	(CFM, G	PM) Pressure	(inches static, feet o	f water, PSI, other?)
Existing Controls:	(dischar	ge damper, inlet guide va	nes, outlet control valve,	bypass valve, etc.)
Existing setpoint:	(inches static, fe	eet of water, PSI, other ?)		
Operating Hours				
The fan or pump operates the follow	ving hours: <i>(Example: 06</i>	600 to 1800)		
Summer		Winter		
Weekdays	to	_ Weekdays	to	
Saturdays	to	_ Saturdays	to	
Sundays	to	_ Sundays	to	
Number of shifts per weekday:		_ Number of shifts per w	eekend day:	
Motor Load				
Option 1: (retrofit): Measured input	power under full load:	der full load:kW, (<i>true RMS power</i>)		Power Factor
Option 2: (retrofit): Measured curre	nt and voltage under full	load:	Amps	Volts
Load calculation =	volts X	amps X	PF =	kW
Option 3: (retrofit or new): Estimate	ed Fan or Pump Load: _	%, Estin	nated Power	kW
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Proposed Operations

The proposed VFD will be automatically controlled to maintain the following set points:

Flow _		(CFM, GPM, other?) Pressure	(inches static, feet of water, PSI, other?)
Other?	(describe):		

	Sur	nmer	Winter		
% Load	Week-day	Week-end	Week-day	Week-end	
90% to 100%					
80% to 90%					
60% to 80%					
20% to 60%					
Off					
Totals	100%	100%	100%	100%	