

Exploring the Next Frontier for Motor Efficiency Programs

Motor & Motor Systems Committee
Breakout Session II
June 11, 2008



Working Together, Advancing Efficiency

Session Agenda

- Check Assumptions
- Enhanced Specification Work to Date
 - Product availability
 - Preliminary analysis
- Open Discussion: “Dig in”
 - Review preliminary enhanced spec. data
 - Identify next steps: data collection and analysis

Checking Assumptions: Program Profile

- Have motor program, plan to continue
- Use NEMA Premium[®] as voluntary standard
- EISA will eliminate voluntary std. in 2010
 - Interested in filling this gap
 - Timing for new program to fill gap: submitted May 2009 to be considered for 2010 implementation
- Evaluation criteria for new programs
 - Energy savings and market potential
 - Implementation factors

Motor Program Infrastructure

- Common Spec. and Brand (NEMA Premium®)
 - Used by 48 members programs
 - Provides savings and “foot in the door”
- Related Marketing Platform: motor mgmt.
 - Motor Decisions Matter (MDMSM)
- Ability to leverage existing relationships with motor manufacturers and stakeholders
 - Information sharing (e.g. shipment data)

Motor & Motor Systems Committee: Potential New Program Options

1. Enhanced performance specification
2. Adjustable Speed Drives (ASDs)
3. Best Practice repair
4. Motor Management
5. Motor Systems guidance
6. Specifications for other motors (e.g. U-frame motors, Design C motors, etc.)

Enhanced Performance Specification: What and Why

- “Enhanced” efficiency: efficiency level above NEMA MG-1, Table 12-12 (NEMA Premium®)
- If appropriate, a new specification could:
 - accelerate production and availability of more efficient motors
 - establish a common voluntary baseline for prescriptive motor programs in U.S. and Canada
 - be easily incorporated into program portfolios (prescriptive program structure is already in place)

Enhanced Performance Specification: Exploring the Potential

- M&MS Discussions: March – May 2008
- Development Process (M&MS Committee)
 - Research technical and market potential
 - Consult with manufacturers and technical experts
 - Develop draft proposal

Technical and Market Potential: Preliminary Data Collection

- Motor Master+ International v 1.0.17
 - 1-200 horsepower (in each table)
 - NEMA Design A/B, 460 volts
 - 3 speeds: 1200 rpm, 1800 rpm, 3600 rpm
 - 2 enclosure types: ODP and TEFC
- Limitations
 - Not all data is up-to-date (range 2002-2007)
 - Incomplete data (product price information)

Technical and Market Potential: Preliminary Data Analysis

- Product Availability
 - Number of manufacturers
 - Product price range
- Energy Savings Potential
 - Efficiency level (above NEMA Premium[®], as listed in NEMA Table 12-10)
 - Estimated annual energy savings (annual kWh)

Energy Savings Potential

Potential Annual Energy Savings =

$$\frac{.746 * \text{hp} * \text{load} * \text{operating hours}}{(\text{NEMA Premium Efficiency} - \text{New Efficiency})}$$

Annual Operating Hours*	
Size Category	Hours
1-5 HP	2,745
6-20 HP	3,391
21-50 HP	4,067
51-100 HP	5,329
101-200 HP	5,200

Motor Load	0.75
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*US DOE, US Industrial Electric Motor Systems Opportunities Assessment, 1998

Totally Enclosed Fan-Cooled (TEFC) 1200 RPMs

HP	CEE Specification/ NEMA Premium		Enhanced Performance						
	Nominal Efficiency	Product Price Range	Nominal Efficiency	NEMA Efficiency Bands	Potential Annual Energy Savings (kWh)	Potential Annual Energy Savings (%)	Number of Manufacturers	Product Price Range	Total Number of Manufacturers
1	82.5	\$376 - \$533	85.5	2	65.3	2%	2	\$374-\$670	5
			84.5	1+	44.1	2%	2		
			84.0	1	33.2	1%	1		
			83.6	less than 1	24.5	1%	1		
			83.0	less than 1	11.2	0%	2		

Listed in Motor Master

Compares NEMA Premium efficiency with enhanced efficiency. Number of NEMA bands listed in NEMA Table 12-10

Number of manufacturers with product at specified enhanced efficiency level (e.g. only products at 85.5)

Total manufacturers with product above NEMA Premium (all products above 82.5)



Enhanced Performance Specification: What is important to Programs?

- Is this data sufficient? Other info?
- How should we analyze the opportunity?
 - Avg. potential energy savings across HP?
 - Potential energy savings at each HP?
 - Potential gross energy savings?
 - Energy savings as a percentage of op. hours?
- What factors are most important?
 - Number of manufacturers?
 - Number of NEMA bands?

Enhanced Performance Specification: Next Steps

- Ongoing M&MS Committee discussions
- Reach out to Motor Manufacturers
 - Updated product lists
 - Updated price information
 - Production factors
- Reach out to Technical Experts
 - Safety concerns
 - Technical issues
- CEE Industry Partners Mtg.: Oct. 15-16



Wrap up

- Next Committee Call:
 - July 16 @ 3pm or July 17 @ 3pm
- Interest in Technical Subcommittee
- Interest in Committee co-chair
- Session evaluation form

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