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Response to other comments to include of reciprocating compressors

Additional submitted attachment is included below.

Sullivan Palatek
AIR COMPRESSORS

January 3, 2019

Alex Galdamez
Commission Staff
The California Energy Commission
1516 Ninth Street
Sacramento, CA 95670

The following comments are on behalf of Sullivan-Palatek, Inc.

Issue: Response to other comments that have requested inclusion of reciprocating compressors to Docket # 18-AAER-05

My background: Bruce C. McFee, Chairman CEO, Sullivan-Palatek, Inc., President, Saylor-Beall Manufacturing Company, PH: 989-224-2371, ext. 229.

Our group herein referred to as Sullivan-Palatek is family owned and we have three product lines, reciprocating air compressors, electric motor driven rotary air compressors, and diesel engine driven air compressors. Our companies employ about 210 people, all located in the US. While we would be considered a small business, we have considerable knowledge, expertise and experience with our staff.

I have worked in the air compressor industry for 34 years. I have visited more than 1,000 customers, hundreds of suppliers and spent substantial time at each of our plant operations. I have two business degrees from the University of Michigan. Prior to joining the air compressor industry, I worked for six years at IBM Corp as a Systems Engineer. I also have participated with our industry association, Compressed Air & Gas Institute (CAGI) since 1990. While you might be getting sick of hearing about my credentials in previous comments, it is very late at night, but you should also know that I have Chaired the CAGI Reciprocating Section for two separate two year terms, including 2017-2018.

During the last few years, our companies participated with the Department of Energy's investigations. Navigant (contracted by DOE) consultants toured both of our facilities where we filled out lengthy questionnaires and answered many questions. In the spring of 2015, we also participated in a manufacturer's survey with Navigant that ended with a four-hour conference call to review our responses. Also, I attended and spoke at the June 20, 2016 meeting in Washington DC. In addition, I have submitted comments to four separate rule making requests for DOE when it has related to compressors and more recently submitted comments to California, Docket 18-AAER-10.

During the same period I have also worked closely with CAGI to better understand the issues and develop an accurate industry response to the DOE NOPR's. The work has included five full days of face to face meetings with other CAGI members, ten regularly scheduled industry association meetings, and numerous conference calls that have continued on for months. The whole group of core members on this CAGI committee has put in lots of hard work and has tried to come up with accurate positions that will meet the needs of DOE, the end customers, and our own companies. I have personally participated in formal CAGI responses to DOE and help drafted selected subsections.

THE COMMENTS: These remarks are in response to comments by…ASAP/ACEEE, California Investor Owned Utilities, and NEEA, ……who have all made recommendations that CEC include reciprocating compressors in their regulation. Part of the justification of these associations comes from an apparent misunderstanding of energy utilization by compressors. The statement by ASAP/ACEEE in their Dec. 21, 2018 comment leads one to believe that reciprocating compressors are a major source of energy consumption. As shown by their comment…..<<< **This is despite the fact that the shipments analysis included in the Technical Support Document (TSD) for DOE's rulemaking found that reciprocating compressors make up more than 97% of all compressors shipped in the US**>>>

Yet the industry association, CAGI has shipment statistics when combined with a DOE table on duty **cycles proves that the reciprocating models being proposed for regulation represent about 2% of the energy consumption as compared to the rotary models** be currently considered by CEC. CAGI data shows that the total KW capacity of shipments of reciprocating compressors in the categories under comparison is about 12.5% of the rotary capacity. If more detail is required, CAGI can prove this on a confidential basis. Combined with the chart below provided by DOE, the usage of reciprocating compressors is about 1/7 of a rotary compressor. Thus the energy consumption of covered recips comes about 2% of the scope of CEC's present plans to regulate.

Table IV.30 Distribution of Annual Hours of Operation by Application

Probability*	Rotary			Reciprocating		
	Base-load	Trim	Intermittent	Base-load	Trim	Intermittent
0%	4,000	2,000	1,000	1,100	650	150
20%	6,552	6,552	3,876	1,198	708	202
40%	7,446	7,446	4,400	1,361	804	338
60%	8,400	8,400	5,928	1,535	1,083	368
80%	8,400	8,400	8,064	1,601	1,474	395
100%	8,400	8,400	8,400	1,601	1,601	731

* DOE assumes a uniform distribution between the listed values

As second issue with reciprocating compressors, there is lack of an energy efficiency standard for this product category. While ISO-1217 could apply to this product line, it severely misrepresents the performance of reciprocating compressors. **The recip is designed to be an intermittent duty cycle product, yet ISO-1217 rates it only at full load.** When it operates at full duty, the Ideal Gas Law causes intercooler capacities to work less efficiently, and the excessive heat causes a reduction in isentropic efficiency of 5% or more when compared to a rotary compressor. Since almost no reciprocating compressors operate is such an environment, not even close, why should such a standard be used to measure their performance?

As third issue comes from a question about which features to measure. Many companies offer as an option, fully package compressors that contain an aftercooler as standard equipment. The less expensive models do not include this aftercooler. Under a performance test, the aftercooler will cause measured isentropic efficiency to be reduced. Yet the lost efficiency also occurs on any standard machine, **except it occurs after the measurement point**. In the case of rotary compressors, a standard applies requiring testing of this aftercooler on all models, thus they have consistency. In the case of reciprocating compressors, an aftercooler might be unnecessary in light duty applications. **These are just two of several issues that must be resolved before any fair test standard might be applied to reciprocating compressors.**

In the applications for reciprocating compressors, the machine **provides compressed air that further allows use of productivity machines at a multiple.** The point is that compressed air's benefits multiply. In California, there are installations that likely have collectively, hundreds of thousands of employees and hundreds of billions in revenues, across government, non-profits and private commerce alike. While it would be possible to focus on an energy efficiency improvement, this issue has not historically been a major criteria given the disproportion economic benefits provided to reciprocating compressor users. This is another reason that no efficiency standard has been adopted by our industry. The cost of energy differential between brands has been immaterial to the benefits to the use, in many cases issues of reliability, noise, ease of maintenance, starting power, and oil consumption are predominant for the intended use.

Given the confusion that would be created by adding reciprocating compressors to CEC's present initiative, we believe inclusion of the reciprocating compressor would encouraged CEC to significantly delay its decision on rotaries. CEC would need more time for examination of differences in reciprocating compressor products, products that would probably provide little added benefit, probably only 2%.

Sincerely,

Bruce McFee
Chairman – Sullivan-Palatek, Inc.
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