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August 22, 2014

United States Consumer Product Safety Commission  
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Attn: Caroleene Paul – [cpaul@cpsc.gov](mailto:cpaul@cpsc.gov)  
Table Saw Project Manager  
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SUBJECT: PTI Response to June 2014 CPSC Staff Statement and April 14, 2014 CPSC Staff Memorandum Regarding “Addendum to ‘Survey of Injuries Involving Stationary Saws: Table and Bench Saws, 2007-2008’: Evaluation of Response Integrity and Resulting Estimates for Types of Saws and Types of Drives”

Dear Ms. Paul,

The Power Tool Institute (PTI) has reviewed both of the CPSC staff documents referenced above, which are hereinafter collectively referred to as the “Addendum.” PTI has serious concerns not only with the unfounded conclusions drawn in the Addendum, but also with the opaque process under which CPSC staff undertook to re-evaluate one conclusion from the 2007-2008 Injury Report. Despite PTI’s longstanding engagement on this matter before CPSC and the position of PTI members in the table saw industry, CPSC staff never informed PTI or its members of this recent project to re-evaluate years-old data. We would be interested to know when Dr. Gass became aware of this CPSC staff project since on its face it appears to be an effort to support arguments made by SawStop.

PTI, of course, is on the record in its criticism of some of the conclusions in the 2007-2008 Injury Report. Amongst all of its flaws, however, perhaps the most glaring error is the survey language for the “drive type” question. Nevertheless, CPSC staff has attempted to use responses to that survey question as the basis to challenge the 2007-2008 Injury Report classification of injury estimates based on the type of table saw. Moreover, such 2007-2008 Injury Report classification based on the type of table saw is supported by other factors.

Rather than using responses to the flawed “drive type” question to challenge the estimated injury distribution amongst table saw categories from the 2007-2008 Injury Report, the responses to the “drive type” question should be discounted entirely.

### **Unsupported Conclusions Related to The Flawed “Drive Type” Question**

#### *Fundamental Flaws with Drive Type Survey Question*

The “drive type” question was fundamentally flawed, in that it incorporated the following descriptions/definitions of the drive system used by CPSC staff:

- *If the blade of the saw is mounted directly onto the motor output shaft, then the table saw is considered to be a direct drive.*
- *If the blade of the saw is driven by a belt or gear that is attached to the motor, then the table saw is considered to be an indirect drive.*

There is no commercially manufactured table saw that is designed with the saw blade being mounted directly to the motor output shaft. All commercially sold table saws are either belt driven or driven through a gear reduction system. While benchtop and contractor table saw categories are associated with preferred drive systems, these two table saw categories are not uniquely correlated with either belt or gear drive systems.

If the 2007-2008 Injury Report survey questionnaire<sup>1</sup> was developed with human factors concerns, was the drive system question ever tested for comprehension with ordinary table saw users? For ordinary customers and even experienced table saw users, having to choose one of the two possible answers for the drive systems is highly confusing, since the respondent is asked to choose between an option where none of the table saws fit the CPSC defined “direct drive” category and an option where all table saws fit the CPSC defined “indirect drive” category. For respondents who were truly knowledgeable about table saw drive configurations, this would be a trick question, whereas other respondents merely would be guessing. Considering the responses from both groups of respondents, the drive type answer is meaningless.

#### *Respondents Were More Likely to Be Able to Identify Type of Table Saw than Type of Drive System*

The statement in the Addendum: *“Because direct and indirect drives exist on many types of products<sup>2</sup> (tables saws are just one), it is possible that the respondents had enough knowledge of drive types to answer this question accurately, while misidentifying the type of saw”* is speculative and contrary to common sense. In addition to the flaws with the “drive type” survey question described above, it flies in the face of reason to conclude that consumers would be more likely to misidentify the type of table saw than the type of drive system. A survey respondent would have to have some level of technical knowledge to distinguish the type of drive of a table saw. All table saw drive systems are below the table top, totally or mostly enclosed and not visible to the operator and not relevant for any table saw operation during everyday table saw use. Conversely, the type of saw question was based on the obvious configuration of the table saw and recognized categories with which most users would have experience when purchasing

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<sup>1</sup> The 2007 – 2008 Injury Report contained the following statements:

- *“The survey questionnaire was developed by covering a range of questions to characterize injuries, hazard patterns, and human factors associated with saw-related injuries.”*
- *“The CATI system also has some built-in edit features. Thus, the software checks for any inconsistency in responses between related questions, and signals the interviewer to verify the entry at the time of the interview.”*
- *“Moreover, an edit program was applied on the data file produced by the CATI system to check the consistency of data items that are logically interrelated.”*

How is it possible that the CATI system and the “edit program” used by CPSC did not immediately flag inconsistent responses? Corrections to the confusing drive type question should have been immediately made before continuing with the remaining survey.

<sup>2</sup> Of all electric power tools designed to work with a circular saw blade, only radial saws are predominantly direct drive. All other power tools with circular saw blades are indirect drive, as the drive systems were defined in the 2007-2008 Injury Report survey.

the table saw, including discussions with sales representatives, discussions within the community of woodworkers and any other research. It is extremely unlikely that an owner of a \$2,000+ cabinet saw would refer to his/her table saw as a benchtop table saw.

Given the foregoing and the acknowledgment in the Addendum that states: *“There is little evidence to show that the “type of drive” question was answered correctly,”* PTI questions how the authors of the Addendum were willing to conclude that: *“there is a small amount of evidence to suggest that this question might have been answered more accurately than the type of saw question”* and also that: *“it can only be stated that the injury estimates are the estimated injuries associated with the reported drive type.”*

Contrary to the conclusions from the recent Addendum, the *“drive type question”* from the 2007-2008 Injury Report is fundamentally flawed and the answers should absolutely not be used as a litmus test to verify the answer to the type of the table saw question. In fact, the *“drive type”* answer should not be linked to any other data or conclusion. On a positive note for the 2007 – 2008 Injury Report, *“the survey questionnaire was developed by covering a range of questions”* and the drive type question is totally irrelevant for the stated goal *“to characterize injuries, hazard patterns, and human factors associated with saw-related injuries.”* The unreliable and confused drive type answers can be discarded without adversely affecting the conclusions concerning the injury characteristics, hazard patterns or human factors associated with saw-related injuries.

#### **Unsupported Re-Evaluation of Table Saw Type Classification Based on Brand Name, Model, Horse Power or Amps:**

The Addendum states: *“A CPSC staff statistician and CPSC staff mechanical engineer, who is also CPSC staff’s subject-matter expert for table saws, independently reviewed the participants’ responses to manufacturer, model, and/or horsepower (or amps) to determine the type of saw involved.”* If in the opinion of the staff, the manufacturer and/or model information signified the type of saw, then the table saw was classified into one of the six categories:

- (1) *Unknown*
- (2) *Portable Bench Saw*
- (3) *Contractor Saw*
- (4) *Fixed Cabinet Saw*
- (5) *Bench or Contractor Saw*
- (6) *Contractor or Fixed Cabinet Saw*

However the Addendum does not elaborate about the methodology or information that *“signified”* to the staff members to make the determination for the type of saw involved. PTI submitted a FOIA request and has received the PDF copies of the 2007-2008 Injury Report<sup>3</sup> survey responses, but for the few dozen instances the brand name of the table saw was redacted, therefore PTI cannot independently verify the determination made by CPSC Staff and our confidence in their determination at this point is low.

It is a well known fact that the horsepower or the amp current rating in the majority of instances cannot be used to identify the type of table saw. There is no correlation between the horsepower or amp rating and the type of the table saw, unless the horsepower is 1.5 or less in which case it is suggesting a smaller induction motor used on contractor table saws or if the

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<sup>3</sup> PTI has received only 795 survey responses instead of 821 responses referred to in the Addendum report.

horsepower is above 3.5, suggesting a very large induction motor used in large cabinet table saws.

At this point, there simply is no credible way to challenge the table saw type answers already given by the respondents. One of the axioms of consumer surveys is that researchers should not alter the respondents' answers. CPSC staff provided no evidence as to why the brand name answer is entitled to more weight than the table saw type answer. PTI members have numerous examples where their product has been associated with an incorrect brand name. In table saw litigation it is a common occurrence that the injured operator can fairly accurately describe the table saw types he/she has used, but cannot correctly identify the table saw brand name.

Assuming that the survey responses provided to PTI were a partial but an accurate copy of the CPSC survey records, then in those 795 survey reports, Q.99 *"Was the table saw portable bench saw model, semi-portable contractor saw model (saw is on frame with legs) or fixed cabinet saw model?"* was asked only of 143 respondents. Only two of the respondents who answered the Q.99, stated *"do not know"* and the remaining respondents were able to identify the type of the table saw involved in their injury. It is clear that over 90% of the respondents were able to give a direct answer to the table saw type question and less than 2% answered *"do not know"*. This fact does not suggest a respondent population that is confused or unsure of their table saw type.

If only 143 respondents answered Q.99 how can the Addendum state:

- *"24 of the 79 responses that reported involvement of a bench saw, were confirmed in the analysis to be bench saws";*
- *"7 of 163 participant responses that reported contractor saws were classified as contractor saws"; and*
- *"25 of the 559 participant responses reporting fixed cabinet saws were classified as fixed cabinet saws"?*

Likewise, the Addendum Table 2 is misleading by suggesting that for "Type of Saw (Question 99) *as reported by participants*", the CPSC staff was able to re-classify all 821 responses. In relation to the "reclassified" responses by CPSC staff, it is noteworthy that 79% of reclassified CPSC responses are "unknown", compared to over 90% known responses by the users who were working and injured on their particular table saw. It appears that CPSC staff is attempting to force a speculative conclusion particularly concerning the benchtop table saws.

PTI is certain that a critical analysis as outlined above of the survey question # 28 and the associated erroneous definitions proves that the responses to the table saw drive system cannot be used or associated with any conclusion or data from the CPSC 2007 – 2008 Injury Report. Furthermore, there is no other reasonable and supported basis to attempt to re-classify survey respondent answers to the type of saw question.

### **Support for 2007-2008 Injury Report Classification of Injury Estimates Based on Table Saw Type**

#### *Table saw injury rate is proportional to magnitude of hazard exposure*

PTI member marketing and risk management experience suggests that accident rates with table saws are not uniform for all table saw type categories. Significant variations exist in the way that various table saws types are used including the frequency of use and the number of years the

type of a saw remains in service. An average cabinet style table saw may be used for hours, almost on a daily basis for many years, compared to an average bench top table saw that may be used only occasionally during the year for significantly fewer years before being discarded. This disparity in usage needs to be considered in evaluating the odds of users sustaining a blade contact injury. For this reason, PTI compiled data on the estimated number of cuts performed by an average table saw of each table saw type category. Using the estimated average frequency of cuts, the estimated saw population, the 2007-2008 Injury Report percentages reported by CPSC, and the number of NEISS projected blade contact injuries for each table saw type category reported by CPSC, PTI has calculated the number of cuts per injury and found them to be significantly similar for each table saw type category; approximately 1.4 million cuts for the bench top category table saws, and approximately 1.2 million cuts for contractor and cabinet category table saws. Thus the higher percentage of injuries reported by the CPSC in the 2007-2008 Injury Report with respect to contractor and cabinet style saws is consistent with the product safety risk assessment principle that the risk of injury is proportional to magnitude of exposure to the hazard of the spinning saw blade, i.e. correlated to the number of cuts made.

*Table Saw Injury Rates for Cabinet and Contractor Table Saws From the 2007-2008 Injury Report are Similar to the Rate of “Finger Saves” Reported by SawStop*

SawStop comments to the ANPR, including “finger saves” reports published by SawStop provide an additional basis to estimate injury rates specifically related to any contractor and cabinet style table saws. This analysis supports the injury classification by table saw type from the 2007-2008 Injury Report.

The reason why “finger saves” reports are predictive for establishing injury rates for table saws is that:

- SawStop has stated that every “finger saves” report represents an incident that but for the AIMS technology, would result in serious injury requiring some form of medical attention.
- SawStop also has claimed that the AIMS technology does not invite riskier behavior by table saw users (i.e. the rate of blade contact incidences on a traditional contractor and cabinet style table saws should be the same as blade contact incident rates reported by SawStop for its contractor and cabinet style table saws).

Let’s examine the cabinet and contractor type table saw blade contact injury rates data:

- A. Based on the CPSC 2007 – 2008 Injury Report, there is estimated to be 45,500 annual blade contact injuries for cabinet saws and 12,600 annual blade contact injuries for contractor saws, which equates to 58,100 injuries for both table saw types combined. The combined volume of these two table saw types during the same two years was at least 3,000,000 units. This data yields an injury rate of .01937 per saw.
- B. Dr. Soderborg, Managing Scientist of Exponent Failure Analysis Associates, has examined the SawStop table saw volumes in use based on numerous deposition testimonies of Dr. Gass and “finger saves” reports as of 2009. Based on the number of table saw sales and the date of the sale he calculated that as of 2009, SawStop table saws totaled 34,506 saw-years of usage and reported 600 “finger saves”. This data yields an injury rate of .017388 per saw. If we apply this injury rate to the known volume of traditional cabinet and contractor table saws combined, the result is 52,164 injuries.

- C. In comments to the ANPR, SawStop reported 83,000 saw-years of usage and 1,316 “finger saves”. This data yields an injury rate of .015855 per saw. If we apply this injury rate to the known volume of traditional cabinet and contractor table saws combined, the result is 47,565 injuries.<sup>4</sup>
- D. In the Addendum, CPSC staff suggests that, based on the “drive type answer”, 33.0% of table saw blade contact injuries in the 2007 – 2008 Injury Report involve indirect drive table saws, that in the opinion of the CPSC staff represents the traditional cabinet and contractor type table saws. This means that based on the “drive type” answer, only 22,077 injuries would be associated with the traditional cabinet and contractor type table saws, which is less than half predicted by the analysis of the data presented by SawStop.

The foregoing establishes that the actual number of blade contact injuries for the traditional cabinet and contractor table saws is much closer to the projections represented by paragraphs A, B or C and not by the revisionary CPSC staff suggestion, expressed in paragraph D.

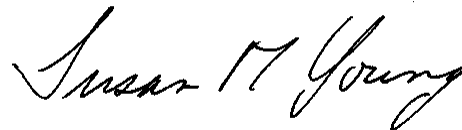
Based on the risk assessment in conjunction with number of cuts required for a blade contact accident as well as injury projections based on “finger save” reports, the overwhelming majority of blade contact injuries is not associated with the “direct drive” table saws, that in the opinion of the CPSC staff represent the bench top table saws, but that the majority of these accidents are indeed associated with the traditional cabinet and contractor type table saws as originally reported in the CPSC 2007 – 2008 Injury Report.

## Conclusion

For the reasons stated above, PTI objects to the Addendum and to CPSC staff’s attempted use of responses to the flawed “drive type” survey question as the basis to challenge the 2007-2008 Injury Report classification of injury estimates based on the type of table saws. We request that the Addendum be withdrawn.

We would be pleased to discuss this matter or any questions you may have regarding our comments.

Sincerely,



SUSAN M. YOUNG

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pti

cc: CPSC Commissioners

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Ed Krenik

PTI Working Group

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<sup>4</sup> It must be pointed out that neither the 83,000 saw-years nor the 1,316 “finger saves” reports are independently verifiable. However it is likely the number of saw-years is over reported, while the “finger saves” are under reported. As stated by Dr. Gass in his comments to the ANPR, not all users who may have experienced a blade contact incident had filed a “finger saves” report to SawStop.