Slip Op. 25-114

UNITED STATES COURT OF INTERNATIONAL TRADE

HYAXIOM, INC., F/K/A DOOSAN FUEL CELL AMERICA, INC., Plaintiff, v. **UNITED STATES,** Defendant.	**Before: Timothy C. Stanceu, Judge** **Court No. 21-00057**

OPINION

[Granting plaintiff's motion for summary judgment in action brought to contest the government's tariff classification of imported "PC50 supermodules"]

Dated: August 26, 2025

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Alexander Vanderweide, Senior Trial Counsel, Commercial Litigation Branch, Civil Division, U.S. Department of Justice, of New York, N.Y., for defendant. With him on the brief was *Yaakov M. Roth*, Acting Assistant Attorney General, *Patricia M. McCarthy*, Director, and *Justin R. Miller*, Attorney-In-Charge, International Trade Field Office. Of counsel on the brief was *Michael A. Anderson*, Office of the Assistant Chief Counsel for International Trade Litigation, U.S. Customs and Border Protection.

Stanceu, Judge: Plaintiff HyAxiom, Inc. ("HyAxiom"), formerly known as Doosan Fuel Cell America, Inc., brought this action to contest the denial by U.S. Customs and Border Protection ("Customs") of its administrative protest involving a tariff classification issue. The parties disagree on the tariff classification of HyAxiom's

merchandise, a "PC50 supermodule" (or "PC50"), imported from Thailand. The PC50 is an assembly of various components to which additional components are added, after importation, in the manufacturing of a complete, stationary hydrogen fuel cell generator, the "PureCell Model 400 hydrogen fuel-cell powerplant" (the "Model 400"). The Model 400 produces energy in the form of electricity and useable heat.

Previously, plaintiff moved, and defendant cross-moved, for summary judgment, both of which motions the court denied upon holding that "there remains a genuine dispute as to a fact material to the tariff classification issue presented by this case—specifically, the 'principal function' of the imported merchandise." *HyAxiom, Inc., f/k/a Doosan Fuel Cell America, Inc. v. United States*, 48 CIT __, __, 726 F. Supp. 3d 1398, 1400 (2024) ("*HyAxiom I*").

Before the court are the parties' renewed cross-motions for summary judgment. The court grants plaintiff's motion, denies the government's cross-motion, and awards summary judgment to plaintiff.

I. BACKGROUND

Background, provided in the court's previous opinion and order, *id*., 48 CIT at __, 726 F. Supp. 3d at 1400, is summarized and supplemented herein.

HyAxiom imported two PC50 supermodules on a single entry made on November 2, 2018 at the Port of New York/Newark. Summons (Feb. 12, 2021), ECF No. 1; First Am. Compl. ¶¶ 1, 32 (Nov. 18, 2022), ECF No. 41. The entry liquidated by

operation of law on November 1, 2019 under a duty-free tariff provision as asserted by HyAxiom and was reliquidated by Customs on January 3, 2020 under a tariff subheading dutiable at 3% *ad valorem*. HyAxiom filed its protest on April 30, 2020, which Customs denied on August 18, 2020. Summons 1. Plaintiff commenced this action on February 12, 2021, Summons, and filed an amended complaint the next year, First Am. Compl.

Plaintiff moved for summary judgment in late 2022, and defendant responded in opposition and cross-moved for summary judgment in March 2023. *HyAxiom I*, 48 CIT at __, 726 F. Supp. 3d at 1400. In *HyAxiom I*, issued on August 28, 2024, the court denied both motions without prejudice. *Id*., 48 CIT at __, 726 F. Supp. 3d at 1413–14.

Following a January 7, 2025 conference with the court, *see* Paperless Order (Jan. 7, 2025), ECF No. 66, the parties filed, on March 28, 2025, a "Joint Statement of Material Facts for which There Is No Genuine Issue To Be Tried" ("Joint Statement") (Mar. 28, 2025), ECF Nos. 71 (public), 72 (conf.) ("*Joint Statement*").[1]

On April 25, 2025, HyAxiom filed its renewed motion for summary judgment. Mem. in Supp. of Pl. HyAxiom, Inc.'s Renewed Mot. for Summ. J. (Apr. 25, 2025), ECF Nos. 73-1 (conf.), 74-1 (public) ("Pl.'s Mot."). On June 6, 2025, defendant filed its renewed cross-motion for summary judgment and response brief. Defs.' Mem. in Supp.

[1] Citations to the Joint Statement of Material Facts for which There Is No Genuine Issue To Be Tried (cited herein as the "*Joint Statement*") are to the public version.

of their Renewed Cross-Mot. for Summ. J. and Resp. in Opp'n to Pl.'s Renewed Mot. for Summ. J. (June 6, 2025), ECF Nos. 75 (conf.), 76 (public) ("Def.'s Mot."). On July 3, 2025, HyAxiom filed its response and reply brief. Pl. HyAxiom, Inc.'s Opp'n to Defs.' Renewed Cross-Mot. for Summ. J. and Reply in Supp. of its Renewed Mot. for Summ. J. (July 3, 2025), ECF No. 77. Defendant chose not to file a reply to plaintiff's motion. *See* Joint Status Report (Mar. 7, 2025), ECF No. 69; Order (Mar. 12, 2025), ECF No. 70.

II. DISCUSSION

A. Jurisdiction; Scope and Standard of Review

The court exercises jurisdiction according to Section 201 of the Customs Courts Act of 1980, 28 U.S.C. § 1581(a), which grants the court "exclusive jurisdiction of any civil action commenced to contest the denial of a protest, in whole or in part, under section 515" of the Tariff Act of 1930 ("Tariff Act"), *as amended*, 19 U.S.C. § 1515.[2]

Actions to contest the denial of a protest are adjudicated by the court *de novo*. 28 U.S.C. § 2640(a)(1) ("The Court of International Trade shall make its determinations upon the basis of the record made before the court . . . ."). The court shall grant summary judgment "if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." USCIT

[2] Citations to the United States Code are to the 2018 edition. Citations to the Harmonized Tariff Schedule of the United States ("HTSUS") are to the 2018 edition, corresponding to the year in which the entry occurred. Citations to the Explanatory Notes ("ENs") to the Harmonized Commodity Description and Coding System are to the 2017 edition.

R. 56(a). In a tariff classification dispute, summary judgment is appropriate where "there is no genuine dispute as to the nature of the merchandise and the classification determination turns on the proper meaning and scope of the relevant tariff provisions." *Deckers Outdoor Corp. v. United States*, 714 F.3d 1363, 1371 (Fed. Cir. 2013) (citations omitted).

B. The Competing Tariff Classification Claims

HyAxiom claims classification of the PC50 in subheading 8405.10.00, HTSUS ("Producer gas or water gas generators, with or without their purifiers; acetylene gas generators and similar water process gas generators, with or without their purifiers; parts thereof: Producer gas or water gas generators, with or without their purifiers; acetylene gas generators and similar water process gas generators, with or without their purifiers"), free of duty. Pl.'s Mot. 12.

Defendant now claims that the PC50 is classified in subheading 8479.89.94, HTSUS ("Machines and mechanical appliances having individual functions, not specified or included elsewhere in this chapter . . . : Other machines and mechanical appliances: Other: Other"), subject to duty at 2.5% *ad valorem*. Def.'s Mot. 8–9.

In its previous motion for summary judgment, defendant claimed that Customs correctly classified the PC50 upon reliquidation in subheading 8503.00.95, HTSUS ("Parts suitable for use solely or principally with the machines of heading 8501 or 8502: Other: Other"), dutiable at 3% *ad valorem*. *Id.* at 3 n.1; *HyAxiom I*, 48 CIT at __, 726

F. Supp. 3d at 1402. As is relevant to a consideration of the government's previous classification position, the article description for heading 8501 is "[e]lectric motors and generators (excluding generator sets)," and the article description for heading 8502 is "[e]lectric generating sets and rotary converters." Stated summarily, the government's previous classification position was that the PC50, which is a component part of the Model 400, should be classified under heading 8503, HTSUS as a "part" of an electric generator of heading 8501, HTSUS.

While not disputing that the PC50 is a part of an electric generator, HyAxiom argues that the correct classification of the PC50 is under heading 8405, HTSUS on the basis of principal function. Pl.'s Mot. 5–11.

C. Tariff Classification under the HTSUS

Tariff classification under the HTSUS is determined according to the General Rules of Interpretation ("GRIs") and, if applicable, the Additional U.S. Rules of Interpretation, both of which are contained in the statutory text of the HTSUS. The GRIs are applied in numerical order, with GRI 1 providing that "for legal purposes, classification shall be determined according to the terms of the headings and any relative section or chapter notes." GRI 1, HTSUS. GRIs 2 through 5 apply "provided such headings or notes do not otherwise require." *Id*. After determining the correct four-digit heading, the court determines the correct subheading by applying GRI 6, HTSUS (directing determination of the subheading "according to the terms of those

subheadings and any related subheading notes and, mutatis mutandis, to the above rules" [GRIs 1 through 5]).

D. Judicial Review in Tariff Classification Disputes

In adjudicating a tariff classification dispute, the court considers whether "the government's classification is correct, both independently and in comparison with the importer's alternative." *Jarvis Clark Co. v. United States*, 733 F.2d 873, 878 (Fed. Cir. 1984) ("*Jarvis Clark*"). The plaintiff has the burden of showing that the government's classification of the subject merchandise was incorrect. *Id.* at 876. If the plaintiff satisfies its burden of demonstrating that the government's classification was incorrect, the court must ascertain "the *correct* result, by whatever procedure is best suited to the case at hand." *Id.* at 878 (footnote omitted).

In determining the correct classification, the court undertakes a two-step analysis. *Faus Grp., Inc. v. United States*, 581 F.3d 1369, 1371 (Fed. Cir. 2009). "The first step addresses the proper meaning of the relevant tariff provisions, which is a question of law. The second step involves determining whether the merchandise at issue falls within a particular tariff provision as construed, which, when disputed, is a question of fact." *Id*. at 1371–72 (citing *Orlando Food Corp. v. United States*, 140 F.3d 1437, 1439 (Fed. Cir. 1998)).

"'Absent contrary legislative intent, HTSUS terms are to be construed according to their common and commercial meanings.'" *La Crosse Tech., Ltd. v. United States*, 723

F.3d 1353, 1358 (Fed. Cir. 2013) (quoting *Carl Zeiss, Inc. v. United States*, 195 F.3d 1375, 1379 (Fed. Cir. 1999)). When interpreting tariff terms in the HTSUS, the court "may consult lexicographic and scientific authorities, dictionaries, and other reliable information sources." *Carl Zeiss*, 195 F.3d at 1379 (citing *Baxter Healthcare Corp. of P.R. v. United States*, 182 F.3d 1333, 1337–38 (Fed. Cir. 1999)).

Pursuant to the "Harmonized System Convention," to which the United States is a signatory, the HTSUS is organized according to rules and nomenclature of the Harmonized Commodity Description and Coding System ("Harmonized System" or "HS") developed and maintained by the Customs Cooperation Council, which is now known as the World Customs Organization. In interpreting the HTSUS, the court consults, in addition to other "reliable information sources," *id*., the Harmonized System's "Explanatory Notes" ("ENs"). Although not legally binding, the Explanatory Notes "are generally indicative of the proper interpretation of a tariff provision." *Degussa Corp. v. United States*, 508 F.3d 1044, 1047 (Fed. Cir. 2007) (citing *Motorola, Inc. v. United States*, 436 F.3d 1357, 1361 (Fed. Cir. 2006)). In particular, the Explanatory Notes are informative as to the intent of the drafters of the Harmonized System where, as in this case, the classification issue presented involves a choice between competing headings and the interpretation of section notes within the Harmonized System nomenclature.

E. Terms of the Headings and the Relative Section and Chapter Notes

GRI 1, HTSUS directs the court to consider the "terms of the headings and any relative section or chapter notes." The candidate headings of the HTSUS the parties have identified in this litigation, with the respective article descriptions, are as follows:

Heading 8405, HTSUS:	Producer gas or water gas generators, with or without their purifiers; acetylene gas generators and similar water process gas generators, with or without their purifiers; parts thereof
Heading 8479, HTSUS	Machines and mechanical appliances having individual functions, not specified or included elsewhere in this chapter [84]; parts thereof
Heading 8503, HTSUS:	Parts suitable for use solely or principally with the machines of heading 8501 [electric generators] or 8502 [electric generator sets]

The parties have not advocated for, and the court has not identified, any other candidate headings.

The court eliminates heading 8479, HTSUS from consideration. The agreed-upon, controlling fact is that the PC50 is designed and built to be a component of an electric generator (regardless of whether it is classified as a "part" under heading 8503, HTSUS). *See Joint Statement* ¶ 4. That fact alone excludes the PC50 from heading 8479. Even were the court to presume, *arguendo*, that the government is correct that the PC50 is not within the scope of heading 8405 (and, as discussed *infra*, the government is not correct), the court would be directed by note 2 to section XVI, HTSUS to heading 8503

(as also discussed later in this Opinion), not to heading 8479. As EN 84.79 instructs, "[t]he machinery of this heading is distinguished from the parts of machinery, etc., that fall to be classified in accordance with the general provisions concerning parts, by the fact that it has individual functions." In other words, articles that are intended for use as "parts of machinery, etc.," in contrast to those that function individually, are not within the scope of heading 8479, HTSUS and instead are classified according to the "general provisions concerning parts." *Id*.; *see* n. 2 to sec. XVI, HTSUS. To summarize, defendant's new classification position would require the court to disregard note 2 to section XVI, HTSUS, even though that note directly applies to the classification issue this case presents. GRI 1 does not allow the court to do so.

In support of its new claim for classification under heading 8479, HTSUS, defendant argues that note 7 to chapter 84, HTSUS is relevant to this case. Def.'s Mot. 8. The court disagrees. In pertinent part, this note provides as follows:

> A machine which is used for more than one purpose is, for the purposes of classification, to be treated as if its principal purpose were its sole purpose.
>
> Subject to note 2 to this chapter and note 3 to section XVI, a machine the principal purpose of which is not described in any heading or for which no one purpose is the principal purpose is, unless the context otherwise requires, to be classified in heading 8479.

N. 7 to ch. 84, HTSUS.[3] The first paragraph of the note is inapplicable to this case. While the parties agree that the PC50 performs more than one function when incorporated into the Model 400, they have not agreed that the PC50 "is used for more than one purpose," and the facts on which they do agree preclude a finding of multiple uses. According to the Joint Statement, the only "use" of the PC50 is as a component in the manufacturing of a Model 400 powerplant, for which the PC50 is uniquely designed and configured. *Joint Statement* ¶ 4.

The second paragraph of note 7 to chapter 84, HTSUS is also inapplicable. Nothing in the paragraph indicates that it applies in the context of this case. As the court has discussed, the effect of the second paragraph is to direct classification, in some instances, to heading 8479, the scope of which excludes articles designed for use as parts of machines.

In further support of its claim for classification of the PC50 under heading 8479 according to note 7 to chapter 84, HTSUS, defendant directs the court's attention to a passage from the General Explanatory Note to HS section XVI:

> Where it is not possible to determine the principal function, and where, as provided in Note 3 to the Section [XVI], the context does not otherwise require, it is necessary to apply General Interpretive Rule 3(c); such is the case, for example, in respect of multi-function machines potentially classifiable in several of the headings 84.25 to 84.30, in several of the headings 84.58 to 84.63 or in several of the headings 84.70 to 84.72.

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[3] The former note 7 to chapter 84, HTSUS appears as note 8 to that chapter in the current edition of the HTSUS.

Def.'s Mot. 15 (quoting EN to sec. XVI, HTSUS). The EN defendant quotes has no relevance to this case. "General Interpretive Rule 3(c)," which is codified as GRI 3(c) in the HTSUS, directs classification in the heading that is "last in numerical order." As does GRI 3 on the whole, GRI 3(c) applies only when classification cannot be determined according to GRIs 1 and 2. That is not the situation this case presents. Because GRI 1, as interpreted according to GRI 2(a), resolves the classification issue before the court, *see infra*, resort to GRI 3 is improper.

While concluding that note 7 to chapter 84, HTSUS does not apply, the court, further to the directive in GRI 1 to consider "any relative section or chapter notes," considers notes 2, 3, and 5 to section XVI, HTSUS to be pertinent to the classification issue presented by this case. *See HyAxiom I*, 48 CIT at __, 726 F. Supp. 3d at 1404–06.

Note 2 to section XVI, HTSUS is relevant generally to the classification of a mechanical or electrical good that is a part of a machine. As pertinent here, note 2 to section XVI provides as follows:

> Subject to note 1 to this section, note 1 to chapter 84 and to note 1 to chapter 85, parts of machines . . . are to be classified according to the following rules:
>
> (a) Parts which are *goods included in any of the headings of chapter 84 or 85* (*other than heading[ ] . . . 8503 . . .*) are *in all cases* to be classified in their respective headings;
>
> (b) *Other* parts, if suitable for use solely or principally with a particular kind of machine . . . are to be classified with the machines of that kind *or in heading* 8409, 8431, 8448, 8466, 8473, *8503*, 8522, 8529 or 8538 as appropriate.

N. 2 to sec. XVI, HTSUS (emphasis added).[4] Although the notes to section XVI do not define the term "parts" or the term "parts of machines," the court interprets "parts" according to the intent of the HS drafters and according to ordinary meaning, which would include the PC50 as a component of a finished Model 400. *See, e.g.*, EN 85.03 (clarifying that HS heading 85.03 includes a "very wide range of parts," including subassemblies such as stators and rotors).

The court concludes that note 2 to section XVI, HTSUS is controlling in this case, which involves an article that either is, or is not, "included in" a heading of chapter 84 or 85 *other than* heading 8503, the scope of which encompasses parts of electric generators. If, as plaintiff maintains, the PC50 is a good "included in" heading 8405 (which includes various gas generators), then this is the correct heading for the PC50 by operation of subparagraph (a) of note 2. If the PC50 is not included in heading 8405, then heading 8503, HTSUS (rather than heading 8479, HTSUS), is correct by operation of subparagraph (b) of the note. As instructed by EN 85.01, "[t]he heading [85.01] covers all electric generators including large generators for power stations . . . [and] generators of various sizes and types used for supplying current for a variety of

[4] Note 1 to section XVI, note 1 to chapter 84, and note 1 to chapter 85, HTSUS list various categories of goods that are excluded from section XVI, chapter 84, and chapter 85, HTSUS, respectively. Because the PC50 does not fall within any of those specified categories, these exclusions are not relevant to the court's inquiry.

purposes . . . ."). The note provides, further, that "**[s]ubject** to the general provisions regarding the classification of parts (see the General Explanatory Note to Section XVI), parts of the machines of this heading are classified in **heading 85.03**."

The parties disagree as to whether the PC50 is a "good included in" heading 8405, HTSUS. Notes 3 and 5 to section XVI, HTSUS are pertinent to that issue.

Note 3 to section XVI applies a "principal function" analysis to the classification of certain machines, providing as follows:

> Unless the context otherwise requires, composite machines consisting of two or more machines fitted together to form a whole and other machines designed for the purpose of performing two or more complementary or alternative functions are to be classified as if consisting only of that component or as being that machine which performs the principal function.

N. 3 to sec. XVI, HTSUS. In *HyAxiom I*, the court concluded that the PC50 is both a "part" and a "machine" within the meaning of that term as used in note 3. 48 CIT at __, 726 F. Supp 3d at 1405. The court cited note 5 to section XVI, HTSUS, which broadly defines the term "machine" as "'any machine, machinery, plant, equipment, apparatus or appliance cited in the headings of chapter 84 or 85,'" and noted that "the PC50, however classified, is . . . a 'part' suitable for use solely with the machines of heading 8501 or 8502" and, therefore, is "'cited in'" heading 8503, HTSUS, if nowhere else. *Id*., 48 CIT at __, 726 F. Supp 3d at 1406 (quoting n. 5 to sec. XVI, HTSUS). The court reasoned, further, that "[w]hether or not the PC50 is considered to be a 'composite machine,' the uncontested facts demonstrate that it answers to the description

'machines designed for the purpose of performing two or more complementary or alternative functions.'" *Id.* (citing n. 3 to sec. XVI, HTSUS). And while the term "function" has multiple definitions, the context in which the term is used in the notes to Section XVI indicates that the term refers to various operations or capabilities of machines, as exemplified by the terms of the headings of section XVI, HTSUS, i.e., in chapter 84 or 85. *See* n. 4 to sec. XVI, HTSUS ("Where a machine (including a combination of machines) consists of individual components . . . intended to contribute together to a *clearly defined function covered by one of the headings in chapter 84 or chapter 85*, then the whole falls to be classified in the heading appropriate to that function.") (emphasis added).

Because the terms of heading 8405 pertaining to "function" are relevant to the classification issue presented here, the court must decide whether, according to the agreed-upon facts, "gas generation" is the principal function of the PC50. As *HyAxiom I* concluded, "GRI 1 requires the court to give effect to notes 2, 3, and 5 to section XVI, HTSUS, which direct the court to determine the appropriate heading for the PC50 according to a principal function analysis."[5] *Id*. The court's opinion in *HyAxiom I*

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[5] Defendant argued previously that notes 3 and 5 to section XVI, HTSUS do not apply in this case. As stated in the court's previous opinion, "[d]efendant argues that '[i]mportantly, Note 2 expressly states that it is subject only "to note 1 to [Section XVI], note 1 to chapter 84 and to note 1 to chapter 85"' and that 'Note 2 is, therefore, not subject to Note 3 or any of the other remaining section and chapter notes.'" (continued…)

proceeded accordingly to address the issue of whether or not the PC50 is classified under heading 8405, HTSUS. *Id*.

F. Scope of Heading 8405

The court interpreted the scope of heading 8405, HTSUS in *HyAxiom I* by analyzing the terms of that heading and the intended meaning of those terms as informed by an Explanatory Note and pertinent dictionary definitions. *Id*., 48 CIT at __, 726 F. Supp. 3d at 1406–11. Rather than repeating here, in the entirety, the court's analysis in *HyAxiom I*, the court summarizes its previous holdings. *HyAxiom I* held that the types of gases produced by the PC50 do not exclude the PC50 from the scope of heading 8405, HTSUS. *Id*., 48 CIT at __, 726 F. Supp. 3d at 1411. It held, second, that the scope of heading 8405 includes machines (including those that are parts of other machines) that are designed to perform "gas generation" (as contemplated by the heading) as the principal function. *Id*., 48 CIT at __, 726 F. Supp. 3d at 1411–13. *HyAxiom I* held, third, that the presence of the heading term "with or without their purifiers" in the article description for heading 8405, HTSUS instructs that the "gas generation" function encompasses more than the generation of a gas in the narrow

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HyAxiom, Inc., f/k/a Doosan Fuel Cell America, Inc. v. United States, 48 CIT __, __, 726 F. Supp. 3d 1398, 1405 (2024). The court rejected this argument, concluding that "[d]efendant mischaracterizes the introductory language to note 2 by which the note is made '[s]ubject to note 1 to this section, note 1 to chapter 84 and to note 1 to chapter 85'" and that "neither the word 'only,' nor other limiting words to that effect, appear in note 2." *Id*.

sense and includes "auxiliary" functions such as purifying, cooling, reheating, or drying. *Id*. The court was guided by EN 84.05 in discerning the intended meaning of the reference in the heading to "purifiers."[6]

Further, the court in *HyAxiom I* rejected defendant's argument that the PC50 is excluded from heading 8405, HTSUS because it is operational, and therefore generates gas, only when incorporated into the Model 400 and connected to a natural gas supply. *Id*., 48 CIT at __, 726 F. Supp. 3d at 1411 (citing GRI 2 and the General Explanatory Note to HS Section XVI). The court also was unconvinced by defendant's argument that the PC50 should be excluded from heading 8405, HTSUS on the premise that it is not "self-

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[6] Explanatory Note 84.05 states, in pertinent part, as follows:

> For certain uses, particularly for supplying gas engines, producer or water gases must be cleaned of impurities such as dust, tars, sulphurous compounds, etc., and sometimes reheated or cooled. For this purpose, the generators are often fitted with purifiers (comprising perforated cones, coke beds, scrubbers, etc.), coolers, dryers, reheaters, etc. Such purifiers and other auxiliary apparatus are classified with the generators when presented therewith, **provided** they are clearly suitable for use together.

EN 84.05.

contained" within the meaning of a reference in EN 84.05. *Id*. Explanatory Note 84.05 states, in part, as follows:

> This heading covers *self-contained* apparatus and plant for generating *any kind of gas* (e.g., producer gas, water gas and mixtures thereof, or acetylene) *whatever the intended use of the gas produced* (lighting, industrial heating, feeding gas engines, welding or cutting metals, chemical synthesis, etc.).

EN 84.05 (emphasis added).

On the issue of whether the PC50 is "self-contained," the court noted in *HyAxiom I* that "[t]he parties agree that the Fuel Processing System ('FPS') of the PC50 consists of the Steam Methane Reformer ('SMR'), the function of which is to generate a gas, and the Integrated Low Temperature Shift Converter ('ILS'), the function of which is to generate a derivative and further processed gas." *HyAxiom I*, 48 CIT at __, 726 F. Supp. 3d at 1411. "According to the uncontested facts, these components of the PC50 together impart to the Model 400 the capability of converting natural gas to the input gas required for the fuel cell stacks." *Id*.

In citing the statement that "[t]his heading covers *self-contained* apparatus and plant for generating any kind of gas," EN 84.05 (emphasis added), defendant argued, in effect, that the PC50 should be excluded from heading 8405 because it is not a "stand-alone" machine and instead is a part of another machine, i.e., the Model 400. For several reasons, the court remains unpersuaded by this argument.

First, the sentence in question does not state unambiguously that a "self-contained apparatus" or "plant" must be a stand-alone device. Where the drafters of the Harmonized System intended to exclude a class or kind of goods from a heading that might appear to describe them, typically they expressed that intent clearly. They did so, for example, in formulating EN 84.05, which expressly excludes from the heading several types of gas generators and directs the reader to other headings. The specified exclusions, which do not describe the PC50, are for "[f]ree-piston generators for gas turbines (**heading 84.14**)," "[c]oke ovens (e.g., town gas generators") (**heading 84.17**)," "[o]zone generating and diffusing apparatus . . . for non-therapeutic purposes . . . and electrolytic gas generators[7] . . . (**heading 85.43**),"and "ozonotherapy apparatus (**heading 90.19**)." *Id.* Aside from these noted exceptions, the HS drafters intended that gas generating machines be classified generally under HS heading 84.05. *Id*. (referring to "any kind of gas").

[7] The parties describe the gas generating functions of the PC50 in ways that clarify that they are not electrolytic in nature. *See Joint Statement* ¶¶ 10 (describing steam methane reformation), 16 (describing water gas shift reaction). "Electrolytic" is defined as "[o]f or relating to electrolysis," which is defined as "the process of passing a current through a liquid to produce a chemical reaction at the electrodes." *Electrolytic*, *Oxford English Dictionary Online* (2025), https://www.oed.com/dictionary/electrolytic_adj?tab=meaning_and_use#5831454 (last visited Aug. 26, 2025); *Electrolysis*, *Oxford English Dictionary Online* (2025), https://www.oed.com/dictionary/electrolysis_n?tab=meaning_and_use#5830979 (last visited Aug. 26, 2025).

Second, excluding the PC50 from heading 8405 on the premise that it is not a stand-alone apparatus is inconsistent with the guidance on the interpretation of note 2 to section XVI provided in the General Explanatory Note to that section. The EN first describes the rules under which parts of machines are "[i]n general" classified in the heading pertaining to the machines except where a separate parts heading is provided. Gen. EN to sec. XVI, HTSUS. The General Explanatory Note goes on to state that "[t]he above rules do **not** apply to parts which themselves constitute an article covered by a heading of this Section [XVI] (**other than** headings 84.87 ["Machinery parts, not containing . . . electrical features, not specified or included elsewhere in this Chapter"] and 85.48 [". . . electrical parts of machinery or apparatus, not specified or included elsewhere in this Chapter"]); these are *in all cases* classified in their own appropriate heading *even if specially designed to work as part of a specific machine*." *Id*. (emphasis in italics provided). As the parties agree, the PC50 is "specially designed to work as part" of the Model 400.

Third, an overly broad interpretation of "self-contained" could defeat the binding effect of GRI 2(a), HTSUS, which provides that "[a]ny reference in a heading to an article shall be taken to include a reference to that article incomplete or unfinished, provided that, as entered, the incomplete or unfinished article has the essential character of the complete or finished article." Thus, an incomplete gas generator with

the essential character of a finished gas generator would be classified under the heading according to GRI 2(a), HTSUS.

Finally, the reference in EN 84.05 to "self-contained" must be interpreted within the context of the EN as a whole, which in various ways cautions against an overly narrow interpretation of the scope. Notably, the EN instructs that even an incomplete gas generating machine that was found to lack the essential character of the finished machine would not necessarily be excluded from the heading, which includes not only gas generators but also "parts thereof." As EN 84.05 provides, "**[s]ubject** to the general provisions regarding the classification of parts (see the General Explanatory Note to Section XVI), parts of the apparatus of this heading are also classified here (e.g., generator bodies, grates, gas collectors and water-carbide mixers)." EN 84.05. The EN also instructs that certain auxiliary equipment that may be physically separate components are classified with the gas generators "when presented therewith, **provided** they are clearly suitable for use together." *Id.*; *see also* n. 4 to sec. XVI, HTSUS ("Where a machine (including a combination of machines) consists of individual components (whether separate or interconnected . . .) intended to contribute together to a clearly defined function covered by one of the headings in chapter 84 or chapter 85, then the whole falls to be classified in the heading appropriate to that function.").

In *HyAxiom I*, the court ruled that the parties' submissions up to that point did not allow it to decide, based on facts about which there was no genuine dispute, the

question of whether gas generation is the principal function of the PC50 and thus, whether the PC50 is within the scope of heading 8405, HTSUS. *Id*., 48 CIT at __, 726 F. Supp. 3d at 1413. Since the court's previous opinion and order, the parties have addressed the "principal function" issue in their Joint Statement and in their renewed cross-motions for summary judgment. As shown by these submissions, the parties disagree on this issue. Plaintiff argues that the uncontested facts demonstrate that "gas generation," as contemplated by the scope of heading 8405, HTSUS, is the principal function of the PC50. Pl.'s Mot. 5–11. Defendant counters that the uncontested facts demonstrate that the PC50 performs multiple functions, no one of which is the principal function; i.e., defendant submits that the PC50 has *no* principal function. Def.'s Mot. 9–15. The court considers this issue below.

G. General Description of the Model 400 and the PC50 Provided in the Joint Statement

In this section of its Opinion, the court describes generally the PC50, and its structural and functional relationship to a finished Model 400, according to the agreed-upon facts as presented in the Joint Statement. In the sections that follow this one, the court identifies those agreed-upon facts that relate specifically to the issue of whether "gas generation" is the principal function of the PC50 and whether the PC50 has the "essential character" of a gas-generating machine for the purpose of GRI 2(a), HTSUS. In the interest of completeness and clarity, the court restates in the subsequent sections some of the agreed-upon facts that are presented in this section.

1. Structure and Function of a Complete Model 400 Powerplant

The PC50 is an assembly consisting of the frame ("support structure"), *Joint Statement* ¶¶ 34–36, and some of the components, of a finished Model 400 "hydrogen fuel-cell powerplant," *id*. ¶ 4. The Model 400 produces an energy output comprised, in equal parts, of electricity and useable heat, for customer use. *Id*. The energy source (input) for the Model 400 is "pipeline-quality natural gas." *Id*. ¶ 8.

Described in general terms, the function of the Model 400 is to generate electricity and heat by feeding a purified, hydrogen-rich gas into four "fuel cell stacks," each of which consists of hundreds of individual fuel cells. *Id.* ¶¶ 5.a, 5.b. In the fuel cells, hydrogen undergoes an electrochemical reaction with oxygen to produce direct current ("DC") electricity, heat, and water. *Id*. ¶ 5.a. The Model 400 converts the DC current into alternating current ("AC") electricity directly for customers or for the electrical grid. *Id*. ¶ 5.c.

2. The Post-Importation Manufacturing Process

After importation of the PC50, the four fuel cell stacks are mounted on the frame that is part of the PC50 assembly. *Id*. ¶¶ 4, 5.a, 36. Also added after importation are two blowers, one of which functions to provide air to the fuel cell stacks, where it reacts with the hydrogen-rich fuel, and another that supports the production of a gaseous mixture. *Id*. ¶ 5.b.

The installations after importation also include an "Electrical System Module" or "ESM," which includes a "power conditioning system" that converts the DC electrical power to AC power, and an "operating controller." *Id*. ¶ 5.c. The parties state that the operating controller:

> communicates with the Model 400 Powerplant's various systems to maintain proper temperature and operation by managing, powering, and collecting data from the Model 400 Powerplant's balance-of-plant components (*i.e.*, the motors, valves, pumps, sensors), communicating with the fuel control system [described *infra*] to manage the flow and consumption of natural gas in the Model 400 Powerplant, regulating the Model 400 Powerplant's coolant, air flow, and thermal balance, and monitoring the amount of heat sent to customers.

Id. Also added after importation is an enclosure that "forms the exterior of the Model 400 Powerplant." *Id*. ¶¶ 5.d, 7 (illustration).

3. Structure and Function of the PC50

Mounted on the frame of the PC50 (as imported) is the Steam Methane Reformer, which the parties describe as "an enclosed cylinder comprised of a . . . burner, below which rests a hexagonally arranged series of tubes" that "are lined with a . . . catalyst." *Id*. ¶ 9. Within the completed and operational Model 400, the function of the Steam Methane Reformer is the generation of a gaseous mixture consisting of approximately 45% hydrogen, 15% carbon monoxide, 10% carbon dioxide, and 30% steam. *Id*. ¶ 10. The Steam Methane Reformer generates this gaseous mixture from a methane (CH_4) input, obtained from the natural gas supplied to the Model 400, and a steam input, both of which are piped into the SMR. *Id*. ¶¶ 10, 13. In the gas generation process, the two

inputs together undergo a "steam methane reforming reaction" in the tubes of the SMR that occurs in the presence of high heat (approximately 800 to 1000 degrees C) and the catalyst. *Id*. ¶¶ 10–12.

Also mounted on the PC50 as imported is the Integrated Low Shift Reactor, which, within an operational Model 400, performs a chemical reaction the parties identify as a "water gas shift reaction." *Id*. ¶¶ 15, 16. This reaction, performed on the gas output of the Steam Methane Reformer, "increases the hydrogen yield in the gas output from the SMR by removing the carbon monoxide that is produced in the SMR to small quantities . . . so that the overall system efficiency is high." *Id*. ¶ 17. The reaction "adjusts or 'shifts' the ratio of hydrogen and carbon monoxide in the SMR's gas output to generate a more hydrogen-rich gas for use in the fuel cell stacks of the completed Model 400 Powerplant." *Id*. ¶ 18. "This gas mixture is approximately 53.5 percent hydrogen, 15.5 percent carbon dioxide, 0.5–1 percent carbon monoxide, and 30 percent steam." *Id*.

The Integrated Low Shift Reactor also performs a purifying function, and thermal regulation functions, for the gas production processes. "The . . . bed of the ILS purifies the incoming natural gas (methane) by removing sulfur compounds before it enters into the SMR" so that sulfur-containing odorants do not damage the reforming catalysts in the SMR. *Id*. ¶ 15. The bed of the ILS contains a "heat exchanger" that "maintain[s] the ILS at safe operating temperatures." *Id*. ¶ 19. Built-in heat exchangers

in the Integrated Low Shift Reactor also "remove heat from the gas stream coming from the SMR." *Id*. ¶ 20. The ILS "transfers that heat to the natural gas and steam going into the SMR, thereby providing an additional heat source (in conjunction with the . . . burner [in the SMR] . . .) for the endothermic steam methane reforming gas generation reaction that occurs in the SMR." *Id*.

The parties refer to the Steam Methane Reformer and the Integrated Low Shift Reactor as the "major components" of the "Fuel Processing System," or "FPS," which, the parties explain, is a system of the PC50. *Id*. ¶ 8. The parties specify that in addition to the SMR and the ILS, "[t]he FPS also includes a fuel control system, an ejector, heat exchangers, and piping that connects its components." *Id*.

Mounted on the PC50 as imported are components described by the parties as comprising the "Thermal Management System" ("TMS"). The TMS performs several functions. First, it "provid[es] cooling water to the FPS and the fuel cell stacks through coolant loops and heat exchangers." *Id*. ¶ 23. Describing this function more fully, the parties explain that the condenser in the Thermal Management System "condenses the water vapor produced by the[] completed Model 400 Powerplant's fuel cell stacks into water, which the TMS then recirculates as coolant water for the FPS, the fuel cell stacks, and other systems of the completed Model 400 Powerplant." *Id*. ¶ 26. Second, the Thermal Management System recovers heat produced in the fuel cell stacks, in two ways. It generates "[h]igh-grade heat . . . in the fuel cell stack coolant loop and is

capable of heating customer-supplied fluids up to 250°F (121°C)." *Id*. ¶ 24. It also recovers "[l]ow-grade" heat from "water vapor produced by the fuel cell stacks[] and is capable of heating fluids up to 140°F (60°C)." *Id*. Third, the Thermal Management System "transports the steam from the fuel cell stacks for the SMR's natural gas reformation process." *Id.* ¶ 26. Fourth, the condenser of the Thermal Management System "exhausts from the Model 400 Powerplant any excess carbon dioxide, steam, and other unreacted gases that remain after passing through the fuel cell stacks." *Id*.

A completed Model 400 contains a "Water Treatment System" ("WTS") and an "Air Processing System" ("APS"). Neither of these systems is described by the parties as present on the PC50 as imported; instead, some components of each are installed on the frame after the PC50 is imported, in the production of the finished Model 400. *See id.* ¶¶ 5.b, 29, 32.

"The WTS includes a resin bed system of demineralizer bottles, which is installed following importation of the PC50 supermodule, that cleans and deionizes water for the PC50 supermodule and the completed Model 400 Powerplant." *Id*. ¶ 29. "The WTS also includes valves, sensors, pipes, and a degasifier, which removes gas air bubbles from the coolant water." *Id*. Thus, some components of the WTS are already present on the PC50 as imported. *See id*. ¶ 3 (illustration of PC50).

The Joint Statement informs the court that the Water Treatment System serves an auxiliary function in support of both the gas generation function (by supporting the

Fuel Processing System) and the electricity generation function (by supporting the fuel cell stacks) of the Model 400: "The WTS ensures (1) that the process water is free of impurities so that the FPS and fuel cell stacks are not damaged, and (2) that proper water quality is supplied to the SMR and fuel cell stacks." *Id*. ¶ 30.

As mentioned previously, two blowers are installed on the frame after importation of the PC50. The assembly that includes the two blowers (constituting a "blower skid") are part of the Air Processing System. *Id*. ¶ 32. One blower provides air to the fuel cell stacks, "where oxygen in the air reacts with the hydrogen-rich fuel in the fuel cell stacks to generate electricity, heat, and water." *Id*.; *see id.* ¶ 5.b ("One blower supplies air to the fuel cell stacks, where it reacts with the PC50 supermodule's hydrogen-rich fuel in the fuel cell stacks to generate electricity, heat, and water."). "The other blower provides air to the burner assembly in the FPS so that the depleted hydrogen from the fuel cell stacks can be burned." *Id.* ¶ 32*; see id.* ¶ 5.b ("The other blower provides air to the burner assembly in the FPS so that enough heat is generated to allow the reactions in the SMR to create a gaseous mixture.").

Lacking the blower skid, the PC50 does not contain the entire Air Processing System but includes "the pipes and sensors of the APS" that "enable the transport of the process air." *Id*. ¶ 32. The Air Processing System also ventilates the space inside the enclosure of the Model 400 "to properly cool and ventilate the components located

within" and "prevents the formation of a combustible mixture in the FPS and the fuel compartment in the unlikely event of a gas leak." *Id*. ¶ 33.

H. The Relationship of the Systems of the PC50 to the "Gas Generation" Function

The Joint Statement discusses four systems contained within the finished Model 400: the "Fuel Processing System," the "Thermal Management System," the "Water Treatment System," and the "Air Processing System." The Joint Statement discloses that of the four systems, only two—the Fuel Processing System, which includes the Steam Methane Reformer and the Integrated Low Shift Reactor, and the Thermal Management System—are systems of the PC50 in the form in which it is imported. *Id*. ¶¶ 8–27 ("Systems and Components of the PC50 Supermodule"). The other two systems, the Water Treatment System and Air Processing System, are described by the parties as including components that are not located on the PC50 as imported and are installed on the frame after importation in the assembly of the completed Model 400. *Id*. ¶¶ 28–33.

The functions of the Water Treatment System and the Air Processing System can be eliminated from consideration in a principal function analysis of the PC50 because the PC50, according to the agreed-upon facts, does not perform either of those functions (although containing some components that contribute to them). To reiterate, the PC50 as imported contains the pipes and sensors, but not the two blowers that move the air, of the Air Processing System. *Id*. ¶ 32. While containing some components of the Water

Treatment System, the PC50 as imported lacks the later-installed "resin bed system of demineralizer bottles" that treats the water ("cleans and deionizes water"), thus preparing the water for use in the Fuel Processing System and the fuel cell stacks. *Id*. ¶ 29.

Because, according to the Joint Statement, the function of the Fuel Processing System is gas generation, and because the Thermal Management System, according to the Joint Statement, contributes to the gas generation function in certain respects, the question presented is whether gas generation, as contemplated by the scope of heading 8405, HTSUS, is the "principal function" of the PC50. Plaintiff maintains that the agreed-upon facts show this to be the case, Pl.'s Mot. 5–8; defendant counters that the PC50 has no principal function, Def.'s Mot. 9–15. Because the PC50 is a component part of the Model 400 hydrogen fuel-cell powerplant, it is logical that the court consider this question by first examining the functions of the PC50 as they relate to the Model 400.

The Model 400 generates electricity by a three-step process of (1) converting a natural gas input, *id*. ¶ 10, into a specially-formulated, hydrogen-rich gas, *id*. ¶¶ 8, 10, 18; (2) generating direct current electricity (along with heat and water, in the form of steam) by providing that gas to the fuel cell stacks, where an electrochemical reaction occurs, *id*. ¶¶ 5.a, 26; and (3) converting the DC electricity to AC electricity, *id*. ¶ 5.c. The electrochemical reaction that produces electricity in the fuel cell stacks also produces useable heat. *Id*. ¶¶ 5.a, 24.

The Fuel Processing System performs the first step of the three-step electricity generation function by converting the natural gas input into the specially formulated, hydrogen-rich gas required by the fuel cell stacks. *Id*. ¶¶ 8–22. The parties agree that the two components that comprise the Fuel Processing System of the Model 400, the Steam Methane Reformer and the Integrated Low Shift Reactor, are components of the PC50 as imported. *Id*. (describing the Steam Methane Reformer and the Integrated Low Shift Reactor as being among the "Systems and Components of the PC50 Supermodule"); *see id*. ¶ 4. Both perform gas generation functions. As stated above, the Steam Methane Reformer generates a gas (containing hydrogen, carbon monoxide, carbon dioxide, and steam), *id*. ¶ 10, and the Integrated Low Shift Reactor further refines this gas to the specially-formulated, hydrogen-rich gas required by the fuel cells (containing hydrogen, steam, carbon dioxide, and a small amount of carbon monoxide), *id*. ¶ 18. Said simply, the PC50 generates the "hydrogen fuel" for the "PureCell® Model 400 hydrogen fuel-cell powerplant." *See id.* ¶ 4.

As the court held in *HyAxiom I*, the "gas generating" function of a machine of heading 8405, HTSUS encompasses more than gas generation in a narrow sense and includes "auxiliary" functions such as purifying, cooling, reheating, or drying of gases. *HyAxiom I*, 48 CIT at __, 726 F. Supp. 3d at 1413. The Fuel Processing System, by means of the Integrated Low Shift Reactor, performs a purifying function for the natural gas input. *Joint Statement* ¶ 15.

The other system of the PC50, the Thermal Management System, also performs some operations that, for purposes of the scope of heading 8405, HTSUS, must be considered to be part of the overall gas generation process. To reiterate, the Thermal Management System "provid[es] cooling water to the FPS and the fuel cell stacks through coolant loops and heat exchangers," *id.* ¶ 23, and, specifically, "condenses the water vapor produced by the[] completed Model 400 Powerplant's fuel cell stacks into water, which the TMS then recirculates as coolant water for the FPS, the fuel cell stacks, and other systems of the completed Model 400 Powerplant," *id*. ¶ 26. In this way, the TMS, "in tandem with the WTS, maintains thermal balance for the systems of the PC50 supermodule and the completed Model 400 Powerplant." *Id*. ¶ 23. Because those "systems" include the gas-generating Steam Methane Reformer and Integrated Low Shift Reactor, this "cooling" operation is auxiliary to, and hence part of, a "gas generation" function for purposes of heading 8405, HTSUS. Also part of the gas generation process is the following: "The TMS also transports the steam from the fuel cell stacks for the SMR's natural gas reformation process." *Id*. ¶ 26.

Another operation of the Thermal Management System is described by the parties as performing heat recovery operations that do not appear to be related to the gas generation function. The TMS recovers, for customer use, high-grade heat from the fuel cell stacks by means of "coolant loops" and low-grade heat from the water vapor produced in the fuel cell stacks. *Id*. ¶¶ 23–24.

The Thermal Management System, by means of its condenser, "also exhausts from the Model 400 powerplant any excess carbon dioxide, steam, and other unreacted gases that remain after passing through the fuel cell stacks." *Id*. ¶ 26. This function supports the electricity- and heat-generation functions, but, as described, cannot be said to be part of the gas generation function of the PC50.

I. The Agreed-Upon Facts Establish that "Gas Generation" Is the Principal Function of the PC50

The descriptions of the PC50 and Model 400 presented in the Joint Statement establish, as a fact about which there can be no genuine dispute, that the principal function of the PC50 is "gas generation" for purposes of heading 8405, HTSUS.

The function of the Fuel Processing System of the PC50 is the generation of the specially-formulated, hydrogen-rich gas required for the electrochemical reaction that is performed by the fuel cell stacks. As discussed above, this function, by providing the hydrogen fuel for the "Model 400 hydrogen fuel-cell powerplant," is one of the three processes by which the powerplant produces electricity (the others being the reaction in the fuel cell stacks using that fuel, and the conversion to alternating current). The Fuel Processing System also is essential to the generation of useable heat by the Model 400, the source of which is the fuel cell stacks that are supplied with fuel by the PC50.

The other system of the PC50, the Thermal Management System, performs one function that is a "gas generation" function in the narrow sense and another that is supportive of, and hence "auxiliary to," a gas generation function for purposes of

heading 8405, HTSUS. As discussed above, the TMS supplies the steam that is used directly by the Steam Methane Reformer of the Fuel Processing System in producing a gas. The TMS also provides the thermal balancing, i.e., the cooling, necessary for the functioning of the Fuel Processing System (as well as the Model 400 on the whole). Although the Thermal Management System performs some operations that are not shown to be "gas generation" functions, i.e., thermal balance for the fuel cell stack operations, heat recovery, and exhausting of unreacted gases from the fuel cell stacks, the fact remains that the Thermal Management System performs others that are "gas generation" functions within the meaning of the heading terms for heading 8405, HTSUS.

In summary, because all of the operations performed by the Fuel Processing System, and two of the operations performed by the Thermal Management System, fall within the scope of "gas generation" as contemplated by heading 8405, HTSUS, these operations, as described by the parties, predominate over the other identified operations of the PC50 in any "principal function" analysis.

To support its contention that the PC50 has no principal function, defendant identifies nine functions of the PC50 that it argues are "more than mere complements or auxiliary components to the PC50's gas generating function." Def.'s Mot. 4. According to this argument, the PC50 lacks a principal function because "[t]he PC50's various

interconnected functions are all necessary for the PC50 and Model 400 to operate." *Id*. The court is not persuaded by this argument.

First, with respect to the Model 400, the presence of what defendant terms "interconnected functions" and, with respect to the PC50, the fact that installation is required before the PC50 can perform a gas generation function, do not exclude the PC50 from the scope of heading 8405, HTSUS. *See HyAxiom I*, 48 CIT at __, 726 F. Supp. 3d at 1411 (citing GRI 2 and the General Explanatory Note to HS Section XVI). As noted above, the Joint Statement clarifies that the Fuel Processing System, the sole function of which is gas generation, and the Thermal Management System, which performs some operations that support that function, are what the parties describe as the two systems of the PC50. That the Model 400 is not operational until completely assembled and installed does not alter those agreed-upon facts.

Second, the court views as a *non sequitur* defendant's argument that because every component or system of the PC50 is essential, there can be no principal function. Defendant argues, specifically, that "[i]f any one system, or constituent component, is removed from the PC50, the Model 400 as a whole would fail. Because each component and system contributes to, and is integral to, the effectiveness of the overall PC50 and Model 400 to generate heat and electricity, none of the components or systems can be said to be performing the principal function." Def.'s Mot. 15. Because nearly any system or component of a machine can be essential to the functioning of the machine

without necessarily performing the principal function, defendant's proffered analysis renders the concept of "principal function" meaningless. *See HyAxiom I*, 48 CIT at __, 726 F. Supp. 3d at 1413 (stating that "a machine can be designed to perform an 'essential' function that is not necessarily the 'principal' function").

Defendant argues that "[b]ecause the PC50 lacks a principal function, 'context otherwise requires' that Note 3 does not resolve the classification dispute." Def.'s Mot. 8 (quoting n. 3 to sec. XVI, HTSUS). The court disagrees. The facts to which the parties agree, as contained in the Joint Statement, leave no room for genuine dispute by establishing conclusively that "gas generation," as broadly contemplated by the scope of heading 8405, HTSUS, is the principal function of the PC50.

Citing facts contained in the Joint Statement, defendant describes various characteristics of the PC50 and Model 400 that in the aggregate do not support its argument that the PC50 has no principal function. Nor do they establish that gas generation is not the principal function. Specifically, defendant identifies the following functions that, in its view, "the PC50 in an operational Model 400 performs":

(1) provides cooling water to the FPS and FCS [fuel cell stacks] [citing *Joint Statement* ¶¶ 19, 23];
(2) collects heat generated by the FCS and makes it available to the Model 400's customers for various applications [citing *id.* ¶¶ 24, 25]
(3) supports the thermal balance and management of the Model 400 [citing *id.* ¶ 23, 32];
(4) condenses steam into water and maintains the quality of water circulated through the powerplant [citing *id.* ¶¶ 24, 26, 28–30];
(5) exhausts any excess gasses from the Model 400 [citing *id.* ¶ 26];

(6) facilitates the flow of process air for the FPS and FCS to function [citing *id*. ¶¶ 31, 32];
(7) ventilates the Model 400's components [citing *id*. ¶ 33];
(8) contains the valves and sensors that communicate with the powerplant's controller to regulate the Model 400's operations [citing *id*. ¶¶ 5.c, 32]; and
(9) provides structural support and protection for the PC50's components, as well as the additional components of the Model 400 that are not included with the PC50 [citing *id*. ¶¶34–36].

Def.'s Mot. 4.

In support of what it labels as function (1), defendant cites paragraph 19 of the Joint Statement, but that paragraph pertains to a temperature-regulating operation, performed by the PC50's Integrated Low Shift Reactor, that is auxiliary to the gas generation process of the ILS. *See Joint Statement* ¶ 19. Defendant also cites paragraph 23 of the Joint Statement, but that paragraph refers to a cooling process performed by the Thermal Management System that is also part of the PC50. A "cooling" function such as that mentioned in the paragraph is among those EN 84.05 defines as "auxiliary" to gas generation. The fact that the cooling function also serves the fuel cell stacks does not alter the agreed-upon fact that the TMS supports gas generation by means of a thermal regulation process.

Regarding defendant's citation of function (2), the court earlier discussed why the "heat recovery" function does not appear to be related to gas generation.

Defendant's description of function (3) is in part a parallel description of its function (1). In support, defendant cites paragraphs 23 and 32 of the Joint Statement, but both of those paragraphs mention operations auxiliary to gas generation. *See id*.

¶¶ 23 (describing provision by the Thermal Management System, "in tandem with" the Water Processing System, of cooling water to the Fuel Processing System as well as to the fuel cell stacks), 32 (stating that one of the blowers of the Air Processing System "provides air to the burner assembly in the FPS so that the depleted hydrogen from the fuel cell stacks can be burned" and that "[p]rocess air from the APS is also used to help maintain the FPS at a proper operating temperature").

Defendant's citations for function (4) also refer to the Thermal Management System and the Water Treatment System. The steam condensing to which defendant refers is conducted by the condenser of the Thermal Management System. *Id*. ¶ 26. The resulting water is recirculated by the TMS "as coolant water for the FPS, the fuel cell stacks, and other systems of the Model 400 powerplant." *Id*. Thus, the processes defendant describes in function (4) support the function of the fuel cell stacks (electricity and heat generation), but they also perform a cooling function auxiliary to gas generation by supporting the Fuel Processing System of the PC50. While defendant cites paragraph 26 of the Joint Statement in support of its "function (4)," that paragraph cites an operation critical to the gas generation process of the Steam Methane Reformer by stating that the Thermal Management System "transports the steam from the fuel cell stacks for the SMR's natural gas reformation process." *Id*.

As the court mentioned earlier, the exhaustion of excess, unreacted gases by the TMS, which is cited in defendant's function (5), has not been shown to be related to gas generation.

Defendant's reliance on function (6) is misguided because the function involved is performed by the Air Processing System and thus is a function that, as the court discussed above, is not performed by the PC50, which lacks the two blowers. Even were it assumed that the Air Processing System performs a function attributable to the PC50, defendant's argument still would be misguided. As mentioned above, the Air Processing System "supplies process air to the FPS," *id*. ¶ 31, i.e., to the very system of the PC50 that generates the hydrogen-rich gas and therefore can be considered an auxiliary gas generation function. Defendant's mentioning of function (7) refers to a function of the Air Processing System that also serves the "fuel" function of the Model 400 and in that respect appears to relate to, *inter alia*, the gas generation function. *See id*. ¶ 33 ("The APS also provides ventilation to the Model 400 Powerplant's *fuel* and motor compartments . . . .") (emphasis added).

Defendant's including function (8) among its list of functions of the PC50 is misleading at best. Defendant cites paragraph 5.c of the Joint Statement, but that paragraph pertains to the function of the Electrical System Module that is a component of the Model 400 but not part of the PC50. *See id*. ¶ 5.c. In describing function (8), defendant also cites paragraph 32 of the Joint Statement, but, as mentioned previously,

that paragraph discloses that the Air Processing System is, among other characteristics, auxiliary to gas generation in that it "provides air to the burner assembly in the FPS [which is located on the PC50] so that the depleted hydrogen from the fuel cell stacks can be burned." *Id*. ¶ 32. The "valves and sensors" to which defendant's description of function (8) refers are the part of the Air Processing System that is located on the PC50, *see id*., so in that respect the PC50 contributes to (but does not itself perform) an air processing function that supports the gas generation function of the PC50.

Defendant's description of function (9) informs the court of nothing more than the uncontested fact that the frame of the PC50 serves as the frame for the assembled Model 400. *See id*. ¶¶ 34–36. Because the frame is a passive, structural component, this fact has little if any probativity on the issue of whether gas generation is the principal function of the PC50.

In summary, the majority of operations cited in six of defendant's group of nine functions, to the extent they are performed wholly or in part by the PC50, pertain directly to gas generation or to operations auxiliary to gas generation as contemplated by heading 8405, HTSUS. Of the nine operational functions defendant mentions, only functions (2) (heat recovery) and (5) (exhaustion of excess, unreacted gases) do not relate to gas generation in the sense contemplated by the heading, and function (9) does not refer to an operational function. Read together, the functions of the PC50 defendant identifies from the Joint Statement do not establish that the principal function of the

PC50 can be anything other than gas generation. The Joint Statement establishes this principal function as a fact about which there can be no genuine dispute.

J. The Agreed-Upon Facts Establish that the PC50 Has the "Essential Character" of a Gas Generating Machine of Heading 8405, HTSUS

The Joint Statement also establishes, as a fact about which there can be no genuine dispute, that the PC50 has the essential character of a gas-generating machine of heading 8405, HTSUS.

The Steam Methane Reformer, one of the gas-generating components of the Model 400, is located on the PC50 as imported. *Id*. ¶¶ 9–10, 12–13. The other gas-generating component of the Model 400, the Integrated Low Shift Reactor, is also located on the PC50 as imported. *Id*. ¶¶ 15–18. The Steam Methane Reformer and the Integrated Low Shift Reactor are described by the parties as the "major components" of the Fuel Processing System, which, the parties agree, is a system of the PC50. *Id*. ¶ 8. The "essential character" requirement of GRI 2(a), therefore, is met according to the agreed-upon facts. *See also* Gen. EN to sec. XVI, HTSUS ("Throughout the Section [XVI] any reference to a machine or apparatus covers not only the complete machine, but also an incomplete machine (i.e., an assembly of parts so far advanced that it already has the main essential features of the complete machine).").

K. The PC50 Is Correctly Classified under Heading 8405, HTSUS

In summary, "gas generation," as contemplated by heading 8405, HTSUS predominates among the several functions the PC50 performs, as demonstrated by the

agreed-upon facts in the Joint Statement. Therefore, classification under that heading is correct under GRI 1 according to the intended meaning of the terms of heading 8405, and according to notes 2, 3, and 5 to section XVI, HTSUS. As is relevant to GRI 2(a), the Joint Statement also establishes, as a fact about which there can be no genuine dispute, that the PC50, even though not a functioning machine as imported, has the essential character of a gas-generating machine of heading 8405, HTSUS. For the reasons discussed above, the court finds meritless the arguments defendant makes to the contrary in support of its current claim for classification under heading 8479, HTSUS, as well as those defendant made previously in support of its former claim for classification under heading 8503, HTSUS.

L. The PC50 Is Correctly Classified under Subheading 8405.10.00, HTSUS

The court determines the correct subheading according to GRI 6, HTSUS, which in pertinent part directs the court to apply the terms of the subheadings and, *mutatis mutandis*, GRIs 1 through 5 at the subheading level. The heading has only two eight-digit subheadings, 8405.10.00, HTSUS for the gas generators of the heading, and 8405.90.00, HTSUS for the parts of these devices. Both are free of duty. Because, consistent with the agreed-upon facts in the Joint Statement, the PC50 has the essential character of a gas generator, the former is the correct subheading.

III. CONCLUSION

For the reasons stated above, the PC50 is correctly classified in subheading 8405.10.00, HTSUS, free of duty. The court will grant plaintiff's pending motion, deny defendant's cross-motion, and enter summary judgment for plaintiff accordingly.

/s/ Timothy C. Stanceu
Timothy C. Stanceu
Judge

Dated: August 26, 2025
New York, New York