

PUBLIC VERSION

**UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C. 20436**

In the Matter of

**CERTAIN MOBILE ELECTRONIC
DEVICES AND RADIO FREQUENCY
AND PROCESSING COMPONENTS
THEREOF**

Investigation No. 337-TA-1065

INITIAL DETERMINATION AND RECOMMENDED DETERMINATION

Administrative Law Judge Thomas B. Pender

Pursuant to the notice of investigation, 82 Fed. Reg. 37899 (Aug. 14, 2017), this is the initial determination on violation and recommended determination on remedy and bonding in *Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof*, United States International Trade Commission Investigation No. 337-TA-1065.

It is held that a violation of section 337 of the Tariff Act, as amended, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain mobile electronic devices and radio frequency and processing components thereof, with respect to asserted claim 31 of U.S. Patent No. 9,535,490.

] *See, e.g.*, CX-3C (Krishna) at Q57-59, Q66-67; Hearing Tr. (Krishna) at 703:3-706:8. While testifying live at the hearing, Mr. Krishna also walked through Qualcomm's timing schematic and explained how it demonstrated that the [] Hearing Tr. (Krishna) at 709:7-711:6; CX-1154C.

Based on the testimonial and documentary evidence of record, I find that the downlink transmissions in the '490 DI Products always start before the uplink transmissions. Therefore, I find that the '490 DI Products practice the claim limitation "wherein the modem processor is further configured [to] pull data from the application processor after transmission of the modem processor to application processor data and before the interconnectivity bus transitions from an active power state to a low power state."

It is my further determination that Qualcomm has shown that the technical prong of the domestic industry requirement is satisfied because the '490 DI Products practice claim 31 of the '490 Patent.

D. Validity

Apple argues that claim 31 of the '490 Patent is obvious in view of U.S. Patent No. 9,329,671 (RX-1146) ("Heinrich") in combination with U.S. Patent No. 8,160,000 (RX-106) ("Balasubramanian"). RIB at 25-38. Based on my review of the record evidence and arguments of the parties, it is my conclusion that Apple has failed to show by clear and convincing evidence that claim 31 of the '490 Patent is invalid as obvious.

1. Disclosure of Heinrich

Heinrich (RX-1146) was filed on January 29, 2013, issued on May 3, 2016, and is prior art to the '490 Patent under post-AIA 35 U.S.C. § 102(a)(2). While Heinrich discloses a modem processor and an application processor connected by an interprocessor communication ("IPC")

bus, Heinrich takes a different approach to configuring and handling IPC communications for power savings when compared to the claimed invention of the '490 Patent. *See* RX-1146 (Heinrich) at 1:24-2:32, 4:6-12; *see* CX-19C (Baker WS) at Q169-172 (“Heinrich is exclusively concerned about the power state of one or more processors.”). Specifically, Heinrich discloses the use of an IPC scheduler (computer program product) that may be used at a first processor for delaying and grouping information that lacks real-time sensitivity (*e.g.*, logging information) for sending to a second, remote processor at a subsequent time period when the second processor will be in an active state, in order to allow the second, remote processor to spend more time in a low power, sleep state where it does not process such information. *See* RX-1146 (Heinrich) at 2:55-3:11 (“computer program product”), 3:50-4:15 (“By grouping the non real-time sensitive IPC activities together and scheduling them for communicating to the second processor during a period in which the second processor is continuously in the first mode, the number of times that the second processor enters and exits the second mode (*e.g.* sleep mode) is reduced.”); *see also id.* at 5:18-39, 7:8-27, 8:21-67, 11:23-52 (“particularly suited to IPC activities including logging information”).

For example, in at least one embodiment, the IPC scheduler both identifies and then allocates a “lazy timer” to each of the “non real-time sensitive IPC activities.” RX-1146 (Heinrich) at 7:65-8:20, 9:1-21. “In general, each lazy timer is configured to fire in response to the earlier of: (1) the expiry of a respective deadline provided to the lazy timer before which it is expected to fire, or (2) a determination that the [remote] application processor **106** is in the awake mode.” *Id.* at 9:22-26, 9:1-21 (“However when one of the registered timers fires, all registered timers expire at the same time, causing all of the aggregated IPC activities to be served at the same time.”). By aggregating non real-time IPC activities at the first processor in this

manner, Heinrich's device provides power savings by reducing the frequency with which the second, remote processor must be woken up from a sleep mode where it is not able to receive remote processor information. *See id.* at 9:1-67, 11:45-52 (“[T]he use of lazy timers to aggregate the non real-time sensitive IPC activities (such as those including logging information) together makes the log data transfers more ‘bursty’ and maybe [sic] aligned with other regular IPC activities. In this way, the application processor **106** may have time to enter the sleep mode between bursts of IPC activity.”); *see also id.* at 5:34-39 (“If the Application Processor **106** is in the sleep mode when the IPC activity is initiated then it is ‘woken up’, i.e. switched to operate in an awake mode in order to process the IPC activity. As an example, the awake mode may have a power consumption which is greater than that of the sleep mode by a factor of approximately 50.”).

Although Heinrich teaches that delaying and grouping of non real-time sensitive IPC activities can be done at either or both of the processors (*see* RX-1146 at 7:19-27), Heinrich does not disclose synchronizing data transmissions in two directions across an IPC bus. *See* Hearing Tr. (Baker) at 1399:20-1400:13; *see also* RX-19C (Baker) at Q214-216. Thus, Heinrich neither teaches nor discloses the claim 31 limitations requiring “an application processor configured to hold application processor to modem processor data until the modem processor ***pulls data from the application processor after transmission*** of the modem processor to application processor data” and “a modem processor [that] is further configured ***pull data from the application processor after transmission*** of the modem processor to application processor data.” *See* RX-19C (Baker WS) at Q208-213, Q243. Nor does Heinrich expressly teach or disclose the claim 31 requirement for sending both downlink and uplink data “before the interconnectivity

bus transitions from an active power state to a low power state.” *See id.* at Q243; Hearing Tr. (Baker) at 1404:3-11.

2. Disclosure of Balasubramanian

Balasubramanian (RX-106) is a Qualcomm patent that predates the ’490 Patent. It issued on April 17, 2012, and is prior art to the ’490 Patent under post-AIA 35 U.S.C. § 102(a)(1). Balasubramanian relates to a user device in a wireless or wired packet-switched communication network, such as a WiFi or WiMAX network. *See* RX-106 (Balasubramanian) at 4:1-29, 15:13-21. Balasubramanian discloses conserving device power by queuing transmission packets while transceiver components in the user device remain in a suspended state (power save mode), and then transmitting the queued packets during a single wake state for the transceiver. *See* RX-106 (Balasubramanian) at 2:55-63, 4:63-5:4, 7:1-3 (once in its wake state, the transceiver “may send the queued packets in relative close succession (e.g., back-to-back) over the communication link 116”). Balasubramanian achieves power savings for the user device by increasing the amount of time that transceiver components can spend in a suspended state, as well as reducing the lag time associated with frequent transitions by the transceiver between its active and suspended states. *See id.* at 5:46-61, 14:49-67.

Balasubramanian is not directed to inter-processor communications within a mobile device terminal and thus does not disclose any of the claim 31 limitations. *See* RX-19C (Baker WS) at Q219. Balasubramanian also instructs against delaying data or using reduced power states at the modem-to-application processor level: “[C]omponents that generate data and packets and perform the queuing and other related operations remain active (e.g., in a wake state),” and “components associated with upper layers remain active to potentially provide

packets for the lower layers once lower layers return to the active state.” RX-106

(Balasubramanian) at 5:16-29, Figs. 9-10; *see also* Hearing Tr. (Baker) at 1401:9-1402:19.

Within the context of communications between a transceiver and a network, Balasubramanian does disclose that transmission packets can be both sent and received by the transceiver during a single wake state. RX-106 (Balasubramanian) at 7:4-7. Balasubramanian teaches that the remote “network interface **112** may [optionally also] be adapted to queue packets destined for the user equipment **102** when the transceiver **110** is in a suspended state. In this case, when the transceiver **110** is transitioned to an active state, the network interface **112** may [also] send the queued packets to the transceiver **110**.” *Id.* at 6:5-10.

Balasubramanian does not, however, disclose a transmission scheme wherein a component will “pull data” from a remote location only “after transmission” of its source data. *See* RX-106 (Balasubramanian) at 7:4-11 (“[T]he network interface **112** may use the receipt of an uplink packet as a trigger to transmit any downlink packets in its queue. Alternatively, the transceiver **110** may send a message to the network interface **112** requesting transmission of all queued packets.”); *see also* RX-19C (Baker WS) at Q220-221; *contra* RX-7C (Yalamanchili WS) at Q399-412, Q414-416. In Balasubramanian, the wired or wireless WiFi or other similar communications link between the transceiver and the network interface would not have any reduced or low power state(s). *See, e.g.,* CX-19C (Baker WS) at Q183; Hearing Tr. (Baker) at 1395:16-1396:24.

3. Heinrich and Balasubramanian: Obviousness

Apple has failed to adduce evidence to show, clearly and convincingly, that a person of ordinary skill in the art would be motivated to modify or combine Heinrich with Balasubramanian to achieve the invention of claim 31 of the ’490 Patent. Heinrich’s objective is

different from the claimed invention—preferentially grouping and delaying certain non real-time sensitive IPC activities (*e.g.*, delayed transmission of logging data) to allow the remote processor to spend more time in a sleep or low power state. *See, e.g.*, RX-1146 (Heinrich) at 1:58-65, 3:50-4:15, 7:1-17; 8:21-67. Balasubramanian also has a different objective from the claimed invention—minimizing power consumed by transceiver components of a user device in a WiFi or other similar packet-switched network. *See* RX-106 (Balasubramanian) at 2:55-59, Fig. 2. Neither Heinrich nor Balasubramanian discloses or otherwise identifies the problem addressed by the claimed invention, which is achieving power savings for a mobile terminal with separate modem and application processors by reducing the frequency of power state transitions being made by the interconnectivity bus connecting the processors. *See* CX-19C (Baker) at Q170-172; Hearing Tr. (Baker) at 1409:18-1410:5.

The record evidence shows that a person of ordinary skill in the art would not have been motivated to combine Heinrich and Balasubramanian. Hearing Tr. (Baker) at 1412:15-1413:1 (Baker). A person of ordinary skill would also not have had a reasonable expectation of success in combining the references to achieve the invention of the '490 Patent. CX-19C (Baker WS) at Q185.

In particular, Dr. Baker provided credible testimony that the Heinrich and Balasubramanian references cannot be combined because their power goals are incompatible with each other, as well as with the '490 Patent. Specifically, Heinrich is focused on power savings for the processor, and Balasubramanian teaches turning a radio transceiver or an entire device off. Hearing Tr. (Baker) at 1403:15-22. By contrast, the '490 Patent focuses on saving power on the bus. Hearing Tr. (Baker) at 1403:23-1404:2.

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As Dr. Baker testified, Heinrich discusses the latency involved in switching between different processor power states, and thereby demonstrates that the power used by the bus (as opposed to the power used by the processors) is not a concern in this reference. Hearing Tr. (Baker) at 1406:6-23. For instance, Heinrich recounts processor power state latency that is orders of magnitude higher than the switching time on an interconnectivity bus. RX-1146 (Heinrich) at 6:42-6:67 (showing latency measurements for switching processor power states); Hearing Tr. (Baker) at 1407:6-1408:7. Heinrich therefore bears little connection to the teachings of the '490 Patent, which is targeted to saving power used by the interconnectivity bus when both processors are awake. Hearing Tr. (Baker) 1408:8-12.

Dr. Baker also provided testimony showing that the Heinrich and Balasubramanian references cannot be combined because they are in different, dissimilar fields. Heinrich and the '490 Patent are in the field of interprocessor communication ("IPC"), but Balasubramanian does not relate to IPC and is directed almost exclusively to voice over IP ("VoIP") communications on a WiFi network. *See* CX-19C (Baker WS) at Q188; RX-106 (Balasubramanian) at 6:34-36, 7:29-31. Due to the many differences between the two fields, Balasubramanian does not suggest that its techniques are applicable to IPC, and Heinrich does not suggest that its IPC techniques could apply to a network like that taught in Balasubramanian. *See* CX-19C (Baker WS) at Q196-98.

The evidence also shows that the references cannot be combined because Heinrich's results alone were outstanding, which would suggest to a person of ordinary skill in the art that Heinrich's approach should not be modified. Hearing Tr. (Baker) at 1412:15-1413:1. Specifically, Heinrich contains testing data (including a table and two case studies) showing significant power savings. CX-19C (Baker WS) at Q232; RX-1146 (Heinrich) at 4:6-12,

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10:44-49, 7:53-62, 13:53-15:25. Modifying Heinrich from a push-only system into a very different system wherein pushes would be coupled with pulls would increase the demands on the application processor and thus risk the large power savings that Heinrich had already achieved. CX-19C (Baker WS) at Q237.

Therefore, as Apple has failed to show clearly and convincingly that a person of ordinary skill in the art would have been motivated to combine Heinrich with Balasubramanian to arrive at the invention claimed in claim 31 of the '490 Patent, I find that Heinrich in combination with Balasubramanian does not render obvious claim 31 of the '490 Patent.

4. Secondary Considerations

Qualcomm argues that secondary considerations of commercial success, industry praise, licensing, copying, and unmet need demonstrate that claim 31 of the '490 Patent is not obvious. CRSB at 45-48. Qualcomm's arguments are mostly, but not wholly, unpersuasive.

For commercial success, Qualcomm argues that it "made over [] of products practicing the '490 Patent from 2013 through 2017. CRSB at 45. However, Qualcomm does not tie these sales to the claimed invention and has failed to establish the required nexus. Qualcomm's arguments for industry praise (which cites to marketing statements from Qualcomm) and licensing (which identifies licenses to multiple Qualcomm patents) also fail to establish a nexus to the '490 Patent. *See* CRSB at 46.

[

] *See* CRSB at 46-48;

RRPB at 16-17. [

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[

]

RRPB at 16-17 (emphasis original) (citations omitted).

[

] On the whole, the evidence does

not support a finding of copying here.

Turning now to Qualcomm's long-felt need argument, the evidence does support a finding that there was a long-standing need in the art for technologies that provide power savings and improve the battery life for mobile devices. *See, e.g.*, RX-1146 (Heinrich) at 1:11-23 (“[F]or computer systems implemented on user devices, such as mobile smart phones and tablets, it is important to keep the power consumption of the computer system at a low level because, for example, the power supply to the user device may be limited.”); *see also* RX-12C (Baker WS) at Q221-226, Q228; JX-003 ('490 Patent) at 1:23-25, 10:36-45. The record evidence indicates that the '490 claimed invention provides for significant device power savings on the order of approximately [] *See* Hearing Tr. (Krishna) at 716:19-717:2 (“Q: What were the results of those studies, power studies that you did, comparing your approach to the conventional

approach? A: In the measurements we did, what we saw was with this patent, we were able to save about [] percent of the power consumption.”); CX-2366C.0013; *see also* JX-003 (’490 Patent) at 8:35-40 (“Thus, if two transitions (i.e., **60**, **62**) from low power to active power occur every time slot **58**, then thousands of transitions **60**, **62** consume substantial amounts of power and reduce the battery life of the mobile terminal **22**.”). Overall, this evidence of long-felt need further supports my finding that claim 31 of the ’490 Patent is not invalid as obvious over the prior art.

VI. Domestic Industry – Economic Prong

A. General Principles of Law

With respect to the economic prong, and whether or not section 337(a)(3)(A) or (B) is satisfied, the Commission has held that “whether a complainant has established that its investment and/or employment activities are significant with respect to the articles protected by the intellectual property right concerned is not evaluated according to any rigid mathematical formula.” *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm’n Op. at 27 (Feb. 17, 2011) (“*Printing and Imaging Devices*”) (citing *Certain Male Prophylactic Devices*, Inv. No. 337 TA-546, Comm’n Op. at 39 (Aug. 1, 2007)). Rather, the Commission examines “the facts in each investigation, the article of commerce, and the realities of the marketplace.” *Id.* “The determination takes into account the nature of the investment and/or employment activities, ‘the industry in question, and the complainant’s relative size.’” *Id.* (citing *Stringed Musical Instruments* at 26).

With respect to section 337(a)(3)(C), whether an investment in domestic industry is “substantial” is a fact-dependent inquiry for which the complainant bears the burden of proof. *Stringed Musical Instruments* at 14. There is no minimum monetary expenditure that a

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could sell chips in the United States through Apple again.⁵⁹ Moreover, the Staff's guess ignores the likelihood that Intel's Board of Directors, [

] would [

] The bottom line for me is that I see the Staff's recommended tailored exclusion order as being a guarantee: (1) of a Qualcomm monopoly; (2) of harm to everyone (especially the economy of the United States) involved but Qualcomm; and (3) of harm to the National Security of the United States.

VIII. Conclusions of Law

1. The Commission has subject matter, personal, and *in rem* jurisdiction in this investigation.
2. The accused products have been imported into the United States.
3. The accused products infringe claim 31 of U.S. Patent No. 9,535,490. The accused products do not infringe claim 7 of U.S. Patent No. 8,698,558, or claims 19, 25, or 27 of U.S. Patent No. 8,633,936.
4. The technical prong of the domestic industry requirement is satisfied with respect to U.S. Patent No. 9,535,490. The technical prong of the domestic industry requirement is not satisfied with respect to U.S. Patent No. 8,698,558 or U.S. Patent No. 8,633,936.
5. The economic prong of the domestic industry requirement has been satisfied with respect to the asserted patents.
6. It has not been shown by clear and convincing evidence that any asserted claim is invalid.

⁵⁹ See *supra* note 44 on page 173.

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IX. Initial Determination on Violation

Accordingly, it is my initial determination that that a violation of section 337 of the Tariff Act, as amended, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain mobile electronic devices and radio frequency and processing components thereof, with respect to asserted claim 31 of U.S. Patent No. 9,535,490.

Further, this initial determination, together with the record of the hearing in this investigation consisting of (1) the transcript of the hearing, with appropriate corrections as may hereafter be ordered, and (2) the exhibits received into evidence in this investigation, is hereby certified to the Commission.

In accordance with 19 C.F.R. § 210.93(c), all material found to be confidential by the undersigned under 19 C.F.R. § 210.5 is to be given *in camera* treatment.

The Secretary shall serve a public version of this initial determination upon all parties of record and the confidential version upon counsel who are signatories to the Protective Order, as amended, issued in this investigation.

Pursuant to 19 C.F.R. § 210.42(h), this initial determination shall become the determination of the Commission unless a party files a petition for review pursuant to § 210.43(a) or the Commission, pursuant to § 210.44, orders on its own motion a review of the initial determination or certain issues herein.

X. Remedy and Bonding

This is the recommended determination (“RD”) of the administrative law judge on remedy and bonding in *Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof*, United States International Trade Commission Investigation No.

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337-TA-1065. As indicated in the Final Initial Determination (“ID”) on violation set forth above, I have found a violation of section 337 of the Tariff Act, as amended (19 U.S.C. § 1337) as to Apple.

A. Limited Exclusion Order

The Commission has broad discretion in selecting the form, scope, and extent of the remedy in a section 337 proceeding. *Viscofan, S.A. v. U.S. Int’l Trade Comm’n*, 787 F.2d 544, 548 (Fed. Cir. 1986). A limited exclusion order directed to a respondent’s infringing products is among the remedies that the Commission may impose. *See* 19 U.S.C. § 1337(d).

Qualcomm and the Staff argue that a limited exclusion order should issue in the event the Commission finds a violation of section 337. CIB at 70; SIB at 36. Apple does not deny that a limited exclusion order would be an appropriate remedy in the event a violation of section 337 is found, but argues that an exclusion order would be against the public interest. *See* RIB at 54-100.

Having considered the arguments of the parties and the evidence of record, it is my recommendation that in the event the Commission determines a violation of section 337 has occurred, it should not issue a limited exclusion order covering mobile electronic devices and radio frequency and processing components thereof found to infringe the Asserted Patents because the Statutory Public Interest Factors weigh against such a remedy.

B. Cease and Desist Order

Section 337 provides that in addition to, or in lieu of, the issuance of an exclusion order, the Commission may issue a cease and desist order as a remedy for a violation of section 337. 19 U.S.C. § 1337(f)(1). The Commission may issue a cease and desist order when it has personal jurisdiction over the party against whom the order is directed. *Gamut Trading Co. v. U.S. Int’l Trade Comm’n*, 200 F.3d 775, 784 (Fed. Cir. 1999).

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The Commission “generally issues a cease and desist order only when a respondent maintains a commercially significant inventory of infringing products in the United States.” *Certain Ground Fault Circuit Interrupters and Products Containing Same*, Inv. No. 337-TA-615, Comm’n Op. at 24 (Mar. 26, 2009). Indeed, cease and desist orders are usually issued “when there is a commercially significant amount of infringing imported product in the United States that could be sold so as to undercut the remedy provided by an exclusion order.” *Certain Protective Cases and Components Thereof*, Inv. No. 337-TA-780, Comm’n Op. at 28 (Nov. 19, 2012) (quoting *Certain Laser Bar Code Scanners and Scan Engines, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-551, Comm’n Op. (Pub. Version) at 22 (June 14, 2007)).

Turning now to the record evidence, Apple has stipulated as to importation and inventory of the Accused Products. JX-13C. According to the stipulation, as of December 31, 2017, [

] JX-13C.2-3. Apple does not dispute that this inventory is commercially significant. *Id.*

Qualcomm argues that the Commission should issue a permanent cease and desist order should it find a violation of section 337. CIB at 70. The Staff agrees that a cease and desist order would be appropriate if a violation of section 337 is found. SIB at 36.

Having considered the arguments of the parties and the evidence of record, it is my recommendation that in the event the Commission determines a violation of section 337 has occurred, it should not issue a cease and desist order as to Apple because the Statutory Public Interest Factors weigh against such a remedy.

C. Bond


Qualcomm does not seek a bond for the sixty-day Presidential review period in the event a limited exclusion order is issued in this investigation. See CIB at 70. Apple and the Staff agree that no bond should be required from Apple during the sixty-day Presidential review period. RRSB at 69; SIB at 36.

Qualcomm has not adduced evidence showing that it sells products that directly compete with Apple's accused iPhone products, and there is no evidence in the record of what a reasonable royalty rate would be for Qualcomm's patented technology. Therefore, I find that a zero-percent bond for the sixty-day Presidential review period is appropriate in the event the Commission issues a limited exclusion order in this investigation.

XI. Order

To expedite service of the public version, each party is hereby ordered to file with the Commission Secretary no later than October 8, 2018, a copy of this initial determination with brackets to show any portion considered by the party (or its suppliers of information) to be confidential, accompanied by a list indicating each page on which such a bracket is to be found and providing a written justification for any proposed redaction specifically explaining why the piece of information sought to be redacted is confidential and why disclosure of the information would be likely to cause substantial harm or likely to have the effect of impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions pursuant to Commission Rules 210.5 and 201.6(a). At least one copy of such a filing shall be served upon my office, and the brackets shall be marked in red. If a party (and its suppliers of information) considers nothing in the initial determination to be confidential, and thus makes no

request that any portion be redacted from the public version, then a statement to that effect shall be filed.



Thomas B. Pender
Administrative Law Judge


Issued: September 28, 2018

**CERTAIN MOBILE ELECTRONIC DEVICES AND
RADIO FREQUENCY AND PROCESSING COMPONENTS
THEREOF**

INV. NO. 337-TA-1065

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **PUBLIC INITIAL DETERMINATION** has been served by hand upon the Commission Investigative Attorney, Lisa Murray, Esq. and the following parties as indicated, on **OCT 29 2018**



Lisa R. Barton, Secretary
U.S. International Trade Commission
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