

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

FORAS TECHNOLOGIES LTD.,

Plaintiff,

v.

DENSO CORPORATION,

Defendant.

Case No. 2:23-cv-00150-JRG
(Lead Case)

JURY TRIAL DEMANDED

FORAS TECHNOLOGIES LTD.,

Plaintiff,

v.

KIA CORPORATION and KIA AMERICA,
INC.,

Defendants.

Case No. 2:23-cv-00219-JRG
(Member Case)

JURY TRIAL DEMANDED

**KIA DEFENDANTS' INITIAL INVALIDITY AND
SUBJECT MATTER ELIGIBILITY CONTENTIONS**

Pursuant to the First Amended Docket Control Order (Docket No. 46), Defendants Kia Corporation and Kia America, Inc. (collectively, "Kia" or "Defendants") hereby respectfully serve their Initial Invalidity and Subject Matter Eligibility Contentions for United States Patent No. 7,502,958 ("the '958 patent") and accompanying document production on Plaintiff Foras Technologies Ltd. ("Foras").

Kia's Initial Invalidity and Subject Matter Eligibility Contentions are based on information reasonably known and available to Kia at this time. Kia has not yet completed its investigation of the facts and documents relating to this action and has not completed its preparation for trial. Because Kia's investigation, prior art search, analysis, discovery, and trial preparation are still

ongoing, Kia may identify additional prior art or arguments that will add meaning to already known prior art or arguments, lead to additions or changes to these Initial Invalidity and Subject Matter Eligibility Contentions, and/or provide additional prior art and arguments. Kia reserves the right to amend, supplement, and/or otherwise modify these Initial Invalidity and Subject Matter Eligibility Contentions. Kia further reserves the right to rely on any facts, documents, or other evidence that are (i) subsequently discovered; (ii) subsequently determined to be relevant for any purpose; or (iii) subsequently determined to have been omitted from these Initial Invalidity and Subject Matter Eligibility Contentions or from a production of documents or things in discovery, including third-party discovery. Kia further reserves the right to rely on reports and/or testimony from experts and from fact witnesses such as prior artists. Documents relating to expert testimony, if any, will be produced when expert discovery is exchanged in accordance with the Docket Control Order.

Foras asserts that Kia infringes claims 1, 2, 3, 6, 8, 19, and 20 of the '958 patent ("Asserted Claims") under 35 U.S.C. § 271. *See* Foras's Disclosure of Asserted Claims and Infringement Contentions for Defendants Kia Corporation and Kia America, Inc. Foras should not be permitted to assert any other claims of the '958 patent. If Foras is permitted to do so over Kia's objections, Kia reserves the right to provide and rely on invalidity and subject matter eligibility contentions for any other claim(s) that Foras asserts—including but not limited to relying on prior art references not otherwise disclosed in these Initial Invalidity and Subject Matter Eligibility Contentions.

Kia expressly denies that any accused product or any of Kia's other products or services infringes the Asserted Claims, and nothing in these Initial Invalidity and Subject Matter Eligibility Contentions should be interpreted as contradicting that express denial of infringement.

The Asserted Claims is invalid under the claim constructions Foras has implied or assumed in its infringement contentions; the claim constructions Kia has implied or assumed in these invalidity contentions; and any other constructions the Court may adopt that are in accordance with law. Kia therefore has based its Initial Invalidity and Subject Matter Eligibility Contentions, at least in part, on the claim constructions or positions that Foras appears to have adopted (explicitly or implicitly) in its Complaint and in its infringement contentions, which include deficiencies and ambiguities that necessarily limit Kia's ability to understand how Foras is interpreting the Asserted Claims. Nothing in these Initial Invalidity and Subject Matter Eligibility Contentions should be construed as an admission that Kia agrees with any of Foras's explicit or implicit claim constructions. To be clear, Kia expressly reserves the right to challenge the sufficiency of Foras's Infringement Contentions and the construction of any claims or claim terms, phrases, or clauses that Foras purports to have explicitly or implicitly construed, that Foras identifies, or that Foras may construe in the future. If Foras proposes new constructions, purports to clarify its existing constructions, or otherwise identifies any constructions in its forthcoming proposed claim terms for construction, preliminary constructions, or throughout the claim construction process, Kia reserves its right to amend, supplement, and/or otherwise modify these Initial Invalidity and Subject Matter Eligibility Contentions. Kia further reserves its right to amend, supplement, and/or otherwise modify these Initial Invalidity and Subject Matter Eligibility Contentions following any constructions adopted by the Court. Prior art not included in this disclosure, whether or not now known to Kia, also may become relevant depending on the claim constructions ultimately adopted by the Court. Under a correct reading of the Asserted Claims in light of the specifications and prosecution histories, the Asserted Claims are invalid for anticipation and/or obviousness based on the prior art cited in these Initial Invalidity and Subject

Matter Eligibility Contentions; for lack of written description and/or enablement under 35 U.S.C. § 112(a); for indefiniteness under 35 U.S.C. § 112(b); and/or for lack of subject matter eligibility under 35 U.S.C. § 101.

The obviousness combinations of references provided below under 35 U.S.C. § 103 are exemplary and are not intended to be exhaustive. Additional obviousness combinations of the references identified below or references yet to be identified are possible, and Kia reserves the right to use any such combination(s) in this litigation. In particular, Kia is currently unaware of the extent, if any, to which Foras will contend that limitations of the Asserted Claims are not disclosed in the art Kia has identified. If an issue arises with respect to any such limitation, Kia reserves the right to identify other references that would have made obvious the addition of the allegedly missing limitation to the disclosed product or method.

Kia further reserves the right to amend its Initial Invalidity and Subject Matter Eligibility Contentions to substitute or add alternative invalidating references if Foras attempts to demonstrate entitlement to an earlier effective filing date for the '958 patent.

The accompanying invalidity claim charts identify specific examples of where a prior art reference discloses—either expressly, implicitly in the larger context of the passage, or inherently—each limitation of the Asserted Claims and/or examples of disclosures in view of which a person of ordinary skill in the art would have considered each limitation anticipated and/or obvious. Where Kia cites to a particular figure in any prior art reference, the citation should be understood to encompass the caption and description of the figure and the text relating to and/or describing the figure. Where Kia cites to particular text that refers to a figure, the citation should be understood to include the figure and related figures as well. In addition, the accompanying invalidity claim charts include examples of where the prior art discloses the subject matter recited

in the preambles of the Asserted Claims without regard to whether the preambles are properly considered to be limitations of these claims.

The accompanying subject matter eligibility claim charts identify each exception to eligibility to which the Asserted Claims is directed and the factual and legal basis therefor; describe the industry, at the relevant time, in which the Asserted Claims is alleged to be well understood, routine, and conventional; and explain how each element of the Asserted Claims, both individually and in combination with the other elements of the claim, was well understood, routine, and conventional and the factual and legal basis therefor. In instances where Kia cites a particular figure or table in a reference, the citation should be understood to encompass the caption and description of the figure or table and any text relating to that figure or table. Similarly, where a cited portion of text refers to a figure or table, the citation should be understood to include the figure or table as well.

In these accompanying invalidity claim charts and subject matter eligibility charts, Kia has endeavored to identify the most relevant portions of the references. But the references may contain additional support for particular claim limitations—including additional invalidity support for ambiguous terms, phrases, or clauses for which it is unclear how Foras purports to construe the term/phrase/clause or how it should be properly construed. Kia reserves the right to rely on uncited portions of prior art references, other documents and/or instrumentalities, and fact and/or expert testimony to provide context or to aid in understanding the references and/or cited portions thereof. Moreover, Kia may rely on admissions concerning the scope of the prior art relevant to the '958 patent found in, *inter alia*, (1) the patent's prosecution history and the prosecution history of related patents and/or patent applications including, but not limited to, United States Patent Nos. 7,627,781 and 7,624,302; (2) any testimony or declarations of named inventor(s) or other fact

or expert witnesses concerning the prior art, the '958 patent, and/or related patents and/or patent applications including, but not limited to, United States Patent Nos. 7,627,781 and 7,624,302; or (3) any papers filed or evidence Foras submits in connection with this litigation or in any other pending or future proceeding involving Foras or any of its predecessors-in-interest or one or more of the '958 patent or any related patents including, but not limited to, United States Patent Nos. 7,627,781 and 7,624,302.

Kia also incorporates by reference Defendant DENSO Corporation's Initial Invalidity Contentions to the extent they relate to claims that are also asserted against Kia.

These disclosures are made without waiver of or prejudice to any objections that Kia may have regarding the subject matter of these disclosures or any documents or individuals identified herein. Kia expressly reserves all objections, including but not limited to: (a) relevance; (b) attorney-client privilege; (c) common interest privilege; (d) work-product privilege and protection; (e) any other applicable privilege or protection under federal or state law; (f) undue burden; (g) over-breadth; (h) the admissibility in evidence of these initial disclosures or the subject matter thereof; (i) producing proprietary and confidential business information, financial data, trade secrets, or secrets that belong to Kia; and (j) any other proper ground. All objections are expressly reserved.

I. INVALIDITY CONTENTIONS

A. Identification of Prior Art

Kia lists below the prior art now known to Kia that Kia contends anticipates and/or renders obvious the Asserted Claims. Each prior art instrumentality identified as such below shall be considered a single prior art reference, regardless of whether that instrumentality is described by multiple patents, publications, or other material (collectively, the "supporting documents"). In other words, each prior art "instrumentality" is one prior art "reference," and Kia has identified the

supporting documents as exemplary materials that describe each such prior art instrumentality. The individual supporting documents themselves shall not be considered separate prior art references for any limitation on the total number of prior art references to be asserted.

For prior art under 35 U.S.C. § 102(a)(1), the below identification and the references themselves, based on Kia's current understanding and knowledge, disclose that the claimed invention was patented, described in a printed publication, in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention. For prior art under 35 U.S.C. § 102(a)(2), the below identification and references themselves, based on Kia's current understanding and knowledge, disclose that the claimed invention was described in an issued patent or in a published application that names another inventor and was effectively filed before the effective filing date of the claimed invention.

Kia's investigation and discovery, including third-party discovery, in connection with this lawsuit is ongoing, and these contentions are based on information obtained to date. If Kia obtains additional information, Kia reserves the right to amend, supplement, or otherwise modify these Initial Invalidity and Subject Matter Eligibility Contentions.

1. Exemplary Knowledge of a Person of Ordinary Skill in the Art

In addition to the prior art references discussed below, the following exemplary documents provide evidence of the knowledge of a person of ordinary skill in the art at the time of the alleged invention:

1. U.S. Patent No. 4,358,823 to McDonald et al.
2. U.S. Patent No. 5,226,152 to Klug et al.
3. U.S. Patent No. 5,249,188 to McDonald
4. U.S. Patent No. 5,537,655 to Truong
5. U.S. Patent No. 5,676,794 to Meredith

6. U.S. Patent No. 5,751,932 to Horst et al.
7. U.S. Patent No. 5,758,058 to Milburn
8. U.S. Patent No. 5,764,660 to Mohat
9. U.S. Patent No. 5,896,523 to Mohat
10. U.S. Patent No. 5,896,523 to Bissett et al.
11. U.S. Patent No. 5,915,082 to Marshall et al.
12. U.S. Patent No. 5,991,900 to Garnett
13. U.S. Patent No. 6,065,135 to Marshall et al.
14. U.S. Patent No. 6,141,770 to Fuchs et al.
15. U.S. Patent No. 6,148,348 to Garnett et al.
16. U.S. Patent No. 6,220,581 to Mueller
17. U.S. Patent No. 6,230,094 to Ohashi et al.
18. U.S. Patent No. 6,263,452 to Jewett et al.
19. U.S. Patent No. 6,438,687 to Klein
20. U.S. Patent No. 6,473,869 to Bissett et al.
21. U.S. Patent No. 6,560,682 to Miller et al.
22. U.S. Patent No. 6,604,177 to Kondo et al.
23. U.S. Patent No. 6,615,366 to Grochowski et al.
24. U.S. Patent No. 6,675,324 to Marisetty et al.
25. U.S. Patent No. 6,687,851 to Somers et al.
26. U.S. Patent No. 6,754,787 to Miller et al.
27. U.S. Patent No. 6,920,581 to Bigbee et al.
28. U.S. Patent No. 6,948,092 to Kondo et al.

29. U.S. Patent No. 7,003,691 to Safford et al.
30. U.S. Patent No. 7,020,800 to Fu et al.
31. U.S. Patent No. 7,085,959 to Safford
32. U.S. Patent No. 7,134,047 to Quach
33. U.S. Patent No. 7,155,721 to Safford et al.
34. U.S. Patent No. 7,191,292 to Chaudhry et al.
35. U.S. Patent No. 7,225,355 to Yamazaki et al.
36. U.S. Patent No. 7,237,144 to Safford et al.
37. U.S. Patent No. 7,251,746 to Fox et al.
38. U.S. Patent Application Publication No. 2002/0144177 to Kondo et al.
39. U.S. Patent Application Publication No. 2002/0152420 to Chaudhry et al.
40. U.S. Patent Application Publication No. 2003/0051190 to Marisetty et al.
41. U.S. Patent Application Publication No. 2003/0070050 to Miller et al.
42. U.S. Patent Application Publication No. 2003/0126498 to Bigbee et al.
43. U.S. Patent Application Publication No. 2003/0135711 to Shoemaker et al.
44. U.S. Patent Application Publication No. 2003/0130281 to Fu et al.
45. U.S. Patent Application Publication No. 2004/0006722 to Safford
46. U.S. Patent Application Publication No. 2004/0019771 to Quach
47. U.S. Patent Application Publication No. 2004/0078650 to Safford et al.
48. U.S. Patent Application Publication No. 2004/0078651 to Stafford et al.
49. U.S. Patent Application Publication No. 2004/0153857 to Yamazaki et al.
50. U.S. Patent Application Publication No. 2005/0172164 to Fox et al.
51. U.S. Patent Application Publication No. 2005/0240806 to Bruckert et al.

52. U.S. Patent Application Publication No. 2005/020811 to Stafford et al.
53. U.S. Patent Application Publication No. 2005/0240829 to Stafford et al.
54. U.S. Patent Application Publication No. 2006/0085677 to Stafford et al.
55. U.S. Patent Application Publication No. 2006/0136672 to Chaudhry et al.
56. U.S. Patent Application Publication No. 2006/0248384 to Stafford et al.
57. U.S. Patent Application Publication No. 2006/0248684 to Vosbikian et al.
58. Japanese Patent Application Publication No. H08-272755
59. Japanese Patent Application Publication No. H05-132256
60. Japanese Patent Application Publication No. H11-265018

2. Applicant-Admitted Prior Art

The '958 patent itself acknowledges that many aspects of the claimed invention were already known in the art. First, the problem of silent data corruption and the need to detect it were known in the art. *See* '958 patent at 1:41–42 (“Silent Data Corruption (‘SDC’) is a difficult problem in the computing industry.”), 1:54–57 (“Numerous techniques have been developed for detecting SDC to prevent the SDC from remaining ‘silent’ or ‘undetected’ within a system, as well as preventing such SDC from propagating through the system.”). One example for solving the SDC problem that the '958 patent identifies is “error correcting codes.” *Id.* at 1:57–59. And the '958 patent acknowledges that “[o]ne approach to SDC detecting in an execution core (or other unprotected area of the processor chip) is to employ ‘lockstep processing.’” *Id.* at 2:13–15. “Generally, in lockstep processing two processors are paired together, and the two processors perform exactly the same operations and the results are compared (e.g., with an XOR gate).” *Id.* at 2:16–19. If the results don’t match, the system signals an error. *Id.* at 2:19–20. This is called “loss of lockstep,” and a POSA would have known this before the earliest effective filing date of the '958 patent. *See id.* at 2:26–28.

The '958 patent goes on to explain that lockstep processing introduces a new problem: how to respond to loss of lockstep. *Id.* at 2:65–66. This problem, too, was known in the art, as the '958 patent acknowledges previous attempts to solve the problem, including those that don't require involving the operating system. *Id.* at 2:17–19, 29–30. One example the '958 patent discusses involves using firmware “to save the state of one of the processors in a lockstep pair (the processor that is considered ‘good’) to memory, and then both processors of the pair are rest and reinitialized.” *Id.* at 3:30–35. “Thereafter, the state is copied from the memory to each of the processors in the lockstep pair.” *Id.* at 3:35–36.

The '958 patent further acknowledges that the features of the claimed invention were well known before its earliest effective filing date. The claimed invention uses known processor architecture (*id.* at 5:3–13 (“In certain embodiments, processors 12A and 12B are processors from the Itanium Processor Family (IPF).”), known firmware (*id.* at 5:20–40 (“[T]he IPF processor architecture includes such supporting firmware as Processor Abstraction Layer (PAL), System Abstraction Layer (SAL), and Extended Firmware Interface (EFI).”), and known operating system methods (*id.* at 5:67–6:8 (“[F]irmware 15 cooperates with OS 11 via standard OS methods to recover the lockstep”). Indeed, the '958 patent admits that the process uses known Advanced Configuration and Power Interface (ACPI) methods to permit firmware cooperation with the OS. *Id.* at 6:2–4, 55–63. The '958 patent further admits that the claimed invention is implemented for “[t]he quintessential model of the traditional IPF architecture.” *Id.* at 7:22–39; *see also id.* at 5:1–19.

Accordingly, the '958 patent admits that persons of skill in the art would have been aware of lockstep processing, problems associated with loss of lockstep, and how to implement methods for detecting and recovering from loss of lockstep using firmware. All of this would have been

known by at least persons of ordinary skill in the art—as well as the general public—before the '958 patent's earliest priority date.

3. Prior Art that Invalidates the '958 Patent

Kia identifies the following prior art as anticipating the Asserted Claims of the '958 patent under 35 U.S.C. § 102 and/or rendering them obvious under 35 U.S.C. § 103, combined with the background knowledge of a person of ordinary skill in the art at the time of the alleged invention of the '958 patent:

1. U.S. Patent No. 5,748,873 to Ohguro et al. (“Ohguro”)
2. U.S. Patent No. 5,954,742 to Williams (“Williams”)
3. U.S. Patent No. 6,058,491 to Bossen et al. (“Bossen”)
4. U.S. Patent No. 6,393,582 Klecka et al. (“Klecka”)
5. U.S. Patent No. 6,625,749 to Quach (“Quach”)
6. U.S. Patent No. 7,085,959 to Safford (“Safford”)
7. U.S. Patent No. 7,107,484 to Yamazaki et al. (“Yamazaki”)
8. U.S. Patent No. 7,502,958 to Nguyen et al. (“Nguyen”)
9. U.S. Patent Application Publication No. 2002/0144177 to Kondo et al. (“Kondo”)
10. U.S. Patent Application Publication No. 2003/0028746 to Durrant (“Durrant”)
11. U.S. Patent Application Publication No. 2003/0051190 to Marisetty et al. (“Marisetty”)
12. U.S. Patent Application Publication No. 2003/0126142 to Tu et al. (“Tu”)
13. U.S. Patent Application Publication No. 2003/0126498 to Bigbee et al. (“Bigbee”)
14. Japanese Patent Application Publication No. H06-242979 (“Akai”)
15. Terayama, F., Korematsu, J., Kitamura, F., Hinata, J., & Enomoto, T. (1993, May). Self-checking and recovering microprocessor G100FTS for fault-tolerant systems. In Proceedings of IEEE Custom Integrated Circuits Conference-CICC'93 (pp. 4-2). IEEE (“Terayama”)

B. Disclosures regarding Anticipation and Obviousness

Kia identifies whether each of the above prior art references anticipates and/or renders obvious the Asserted Claims and produces exemplary invalidity claim charts as Exhibits A through N. Kia also identifies examples of combinations of the above prior art references that make the Asserted Claims invalid under 35 U.S.C. § 103 for obviousness. A person of ordinary skill in the art would have been motivated to combine prior art references in the manner identified, including in combination with the person of ordinary skill in the art's own knowledge.

The exemplary invalidity claim charts identify where each element of the Asserted Claims can be found in each prior art reference. For many prior art references and claim elements, the prior art reference discloses the claim element in multiple places (including any of the supporting documents used to describe each prior art instrumentality) or there are multiple descriptions of where and how the prior art reference discloses the claim element. Thus, Kia has provided exemplary citations to descriptions of where each element of the Asserted Claims is found within each prior art reference. Kia may rely on other descriptions of where each element of the Asserted Claims is found within each prior art reference. In instances where Kia cites a particular figure or table in a prior art reference, the citation should be understood to encompass the caption and description of the figure or table and any text relating to that figure or table. Similarly, where a cited portion of text refers to a figure or table, the citation should be understood to include the figure or table as well.

Where Kia identifies a prior art reference as anticipating the Asserted Claims, any element of the Asserted Claims that is not expressly disclosed by the prior art reference is implicitly and/or inherently disclosed by the prior art reference—based on, for example, how the prior art reference and claim element would be understood by a person of ordinary skill in the art at the time of the alleged invention. If any of the prior art references are found not to anticipate the Asserted Claims,

Kia contends that these references nevertheless render the Asserted Claims obvious, individually or at least in combination with each other or other references, as explained herein and in the accompanying charts. If prior art identified by Kia as anticipating is found not to anticipate the Asserted Claims, the claim does not go beyond combining known elements to achieve predictable results or do more than choose between clear alternatives known to those of skill in the art. If prior art Kia has identified as anticipating is found not to anticipate the Asserted Claims, the claim is also nevertheless invalid because the Asserted Claims contains nothing that goes beyond “ordinary innovation.”

As explained herein and/or in the accompanying charts, it would have been obvious to a person of ordinary skill in the art at the time of the alleged invention claimed in the '958 patent to combine the various references cited herein to arrive at the Asserted Claims. Where Kia has identified a combination of prior art references that make the Asserted Claims obvious, Exhibits A through N identify where each element of each Asserted Claim is found within each item of prior art used in such combination. If a specific combination is not referenced herein, Kia contends that it would have been obvious to a person of ordinary skill in the art to combine the various references cited herein so as to practice the Asserted Claims. If Foras contends that a particular claim limitation is allegedly missing in a particular reference, a person of ordinary skill in the art would have found it obvious to combine that reference with any of the other references cited herein or in the accompanying charts to arrive at the allegedly missing claim limitation.

With regard to motivation to combine and other obviousness factors, a person of ordinary skill in the art at the time of the alleged invention of the '958 patent would have been motivated to combine each of the prior art references identified in the accompanying charts. The motivation and/or incentive to combine these references comes from many sources, including but not limited

to the known published prior art references and products themselves, the background knowledge of those of ordinary skill in the art, the common field of technology of the references, and the teachings in the references directed to solving the problem that the '958 patent was allegedly directed to solving. These references identify and address many of the same technical issues (e.g., error handling in a fault-tolerant lock-stepped multi-processor system) and suggest similar solutions to those issues (e.g., when possible, recovering lockstep without crashing the system). Accordingly, the teachings of the individual prior art references, combined with the background knowledge of a person of ordinary skill in the art at the time of the alleged invention of the '958 patent, would have rendered obvious the Asserted Claims for at least the reasons described below and in the accompanying charts.

Kia reserves the right to amend, supplement, and/or otherwise modify these Initial Invalidity and Subject Matter Eligibility Contentions. Among other things, Kia's investigation and discovery, including third-party discovery, in connection with this lawsuit is ongoing, and these contentions are based on information obtained to date. The Court has not yet construed any terms or phrases of the Asserted Claims, and Foras has not provided any validity contentions in response to any of Kia's invalidity and subject matter eligibility contentions. In particular, Foras has not identified any way in which it disputes that the Asserted Claims are invalid based on the prior art Kia has identified—including any way in which Foras disputes that these prior art references disclose each and every element of each Asserted Claim either by anticipation or through obviousness. Accordingly, Kia reserves the right to amend, supplement, and/or otherwise modify these Initial Invalidity and Subject Matter Eligibility Contentions. If, for example, Foras disputes that a prior art references discloses a claim element, Kia may identify other aspects or disclosures of the prior art reference and any other prior art reference that would have made obvious the

addition of the allegedly missing limitation(s) to the disclosed reference.

1. Anticipation and/or Obviousness of the '958 Patent

Accompanying Exhibits A through N are exemplary charts that identify prior art references that anticipate the Asserted Claims of the '958 patent. In addition to the anticipatory references described below and/or in the accompanying charts, the Asserted Claims of '958 patent are invalid for obviousness.

The ultimate determination of whether an invention is or is not obvious is a legal conclusion based on underlying factual inquiries including “(1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness.” *Miles Labs., Inc. v. Shandon, Inc.*, 997 F.2d 870, 877 (Fed. Cir. 1993); *see also Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966). The U.S. Supreme Court’s decision in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 415–16 (2007), reaffirmed *Graham* and further held that a claimed invention can be obvious even if there is no teaching, suggestion, or motivation for combining the prior art to produce that invention. In summary, *KSR* holds that patents based on new combinations of elements or components already known in a technical field may be found to be obvious. *See generally KSR*, 550 U.S. 398. Specifically, the Court in *KSR* rejected a rigid application of the “teaching, suggestion, or motivation [to combine]” test. *Id.* at 418–19. “In determining whether the subject matter of a patent claim is obvious, neither the particular motivation or the avowed purpose of the patentee controls. What matters is the objective reach of the claim.” *Id.* at 419. “Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *Id.* at 420. In particular, in *KSR*, the Supreme Court emphasized the principle that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable

results.” *Id.* at 416. A key inquiry is whether the “improvement is more than the predictable use of prior art elements according to their established functions.” *Id.* at 417.

Kia generally contends that the Asserted Claims of the ’958 patent would have been obvious because they, at most, only slightly modify a known solution to a common issue at the time or merely arrange old elements, with each performing the same function that had previously been known, to perform and yield no more than what one of ordinary skill would expect from such an arrangement. The ’958 patent claims many generic elements of methods and/or devices for detecting and recovering loss of lockstep. For example, as discussed above, the ’958 patent admits that the claimed method is meant for implementation on traditional IPF architecture using firmware described in the *Intel IA-64 Architecture Software Developer’s Manual, Volume 2: IA-64 System Architecture*. ’958 patent at 7:22–39. Accordingly, both the firmware and the operating system the claimed invention requires were known in the art before the ’958 patent. *See id.* at 5:3–13, 5:20–40, 5:67–6:8.

Many other references described herein demonstrate that there was nothing novel or nonobvious about the subject matter of the Asserted Claims of the ’958 patent at the time of its earliest effective filing date (or any time later). As described in the accompanying charts, multiple references describe the use of lockstep processing, detecting loss of lockstep, idling the processors upon detecting loss of lockstep, determining whether lockstep is recoverable and, if so, recovering lockstep, and triggering the operating system to recognize the lockstep recovery.

In addition to the above obviousness factors, various additional exemplary combinations, modifications, and reasons or motivations to implement such combinations and modifications are provided below. In addition to the prior art identified herein and in the accompanying charts, prior art not included in this disclosure, whether or not now known to Kia, may become relevant

depending on the claim constructions the Court ultimately adopts.

In addition to the prior art references identified below and in the accompanying charts, Kia also relies on relevant portions of the '958 patent, the file histories of the '958 patent, the '958 patent itself (including the cited references), and other evidence, including fact and expert testimony, to prove that the Asserted Claims is anticipated and/or rendered obvious under 35 U.S.C. §§ 102 and/or 103.

If Foras challenges a combination of prior art Kia has identified, Kia reserves the right to supplement these Initial Invalidity and Subject Matter Eligibility Contentions to further specify the reason or motivation to combine the prior art in the manner suggested.

a. Akai

Akai published on September 2, 1994, and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit A provides examples of where Akai discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Akai does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Akai alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen
4. Quach
5. Durrant
6. Yamazaki
7. Nguyen
8. Oghuro
9. Tu
10. Safford
11. Bigbee

12. Kondo
13. Marisetty
14. Williams
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Akai with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Akai discloses using processor device self-diagnosis to detect mismatch error and trigger corresponding error recovery process. Akai at [0012], [0024], [0025]. A POSA would have been motivated to look for additional details on firmware based implementation solutions for similar functions, and many of the references cited herein provide a firmware-based error handling solution, *e.g.* Quach, Bigbee, Kondo, Tu, Nguyen, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Akai but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Akai with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example, Akai discloses how to handle loss of lockstep using a standby lockstep pair. Akai at Abstract, [0034]-[0036]. A POSA would have been motivated to look for additional details regarding whether and how to recover the pair which lost the lockstep state because otherwise the system would have been vulnerable to further errors. References disclosing how to recover a lockstep-lost pair. Many of the references cited herein provide a solution to recover from loss of lockstep, *e.g.* Klecka, Nguyen, Kondo, Tu. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by

Foras that Akai does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

b. Bigbee

Bigbee published on July 3, 2003, and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit B provides examples of where Bigbee discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Bigbee does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Bigbee alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen
4. Quach
5. Durrant
6. Akai
7. Yamazaki
8. Oghuro
9. Tu
10. Safford
11. Williams
12. Kondo
13. Marisetty
14. Nguyen
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Bigbee with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Bigbee but would have been motivated by ordinary innovation, ordinary skill,

and common sense to modify the technology in Bigbee with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example, Bigbee focuses on how to recover from errors occurred within processor cores via a processor error handler. Bigbee at [0019]. A POSA would have been motivated to look for references disclosing how to recover from the other types of error disclosed in Bigbee, such as the “FRC mismatch error” (*see* Bigbee [0033]). Many of the references cited herein provide a solution to recover from loss of lockstep, *e.g.* Klecka, Nguyen, Kondo, Tu, especially Nguyen and Tu, which are from the same applicant/assignee Intel and based on the similar FRC-enabled (functional redundancy checking) processor architecture. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Bigbee does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

c. Bossen

Bossen issued on May 2, 2000, and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit C provides examples of where Bossen discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Bossen does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Bossen alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading or in the accompanying charts including:

1. Applicant Admitted Prior Art
2. Klecka
3. Oghuro
4. Quach
5. Safford
6. Yamazaki
7. Nguyen
8. Durrant
9. Tu
10. Akai
11. Bigbee
12. Kondo
13. Marisetty
14. Williams
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Bossen with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Bossen discloses a time-lag computing mechanism for handling error in fault tolerance systems and further discloses that “The time-lag computing mechanism can be applied at any level of granularity” such as “clock cycle, machine instruction, or high-level software statement.” Bossen at 7:33-43. A POSA would be motivated to look for various application solutions for using the time-lag computing mechanism to handle errors, including firmware-based solution, i.e., software embedded in hardware and considered as machine instructions. Many of the references cited herein provide a firmware-based soft error recovery solution, *e.g.* Quach, Bigbee, Kondo, Tu, Nguyen, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Bossen but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Bossen with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Bossen does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

d. Durrant

Durrant published on February 6, 2003, and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit D provides examples of where Durrant discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Durrant does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Durrant alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen
4. Quach
5. Safford
6. Yamazaki
7. Nguyen
8. Oghuro
9. Tu
10. Akai
11. Bigbee
12. Kondo
13. Marisetty
14. Williams
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Durrant with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Durrant discloses using a bridge

control logic and a bridge controller to trigger the error recovery process. *See, e.g.*, Durrant at [0131], [0137]. A POSA seeking to implement Durrant would have been motivated to look for additional details regarding firmware based implementation solutions for similar functions, and many of the references cited herein provide a firmware-based error handling solution, *e.g.* Quach, Bigbee., Kondo, Tu, Nguyen, Marisetty Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Durrant but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Durrant with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example, Durrant discloses a step for evaluating error state to “determine whether one of the processing sets is faulty” in “a possible sequence of operating stages where lockstep errors are detected”. Durrant at [0145], [0159], Fig. 14, Fig. 16. For additional details on what would happen if none of the processing set is fault and there is still a mismatch, a POSA would have been motivated to look for references providing solutions for this situation. Many of the references cited herein provide a solution for this exact situation, *e.g.* Klecka, Nguyen, Kondo, Tu. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Durrant does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

e. Klecka

Klecka issued on May 21, 2002, and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit E provides examples of where Klecka discloses,

either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Klecka does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Klecka alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Oghuro
3. Bossen
4. Quach
5. Safford
6. Yamazaki
7. Nguyen
8. Durrant
9. Tu
10. Akai
11. Bigbee
12. Kondo
13. Marisetty
14. Williams
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Klecka with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Klecka discloses that a correction process “may be implemented either as a hardware process or a software process”. Klecka at 6:37-47. Klecka also mentions the invention is mostly for correcting soft errors/failures. Klecka at 1:29-34, 2:27-30. A POSA would have been motivated to look for various implementation solutions for soft error correction/recovery, including firmware-based solutions, i.e., software embedded in hardware, and many of the references cited herein provide a firmware-based soft error recovery solution, *e.g.* Quach, Bigbee, Kondo, Tu, Nguyen, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or

improvements to the technology in Klecka but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Klecka with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. Such modification would have been obvious to try and its results predictable. For example, Klecka discloses “various modifications can be made” and discusses a possible way to improve/alter the disclosed timer function (*see*, Klecka at 9:63-10:10). A POSA would be motivated to look for similar solutions for potential improvement and other soft error recovery methods using a timer, such as those disclosed in Nguyen, Tu, Kondo. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Klecka does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

f. Kondo

Kondo published on October 3, 2002, and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit F provides examples of where Kondo discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Kondo does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Kondo alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen

4. Quach
5. Durrant
6. Akai
7. Yamazaki
8. Oghuro
9. Tu
10. Safford
11. Williams
12. Bigbee
13. Marisetty
14. Nguyen
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Kondo with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Kondo discloses error recovery processes from lockstep errors using “low level operating system (OS)”. Kondo at [0126]-[0142]. A POSA would have been motivated to look for various implementation solutions of low level OS for the recovery process, including firmware-based solutions, i.e., software embedded in hardware, and many of the references cited herein provide a firmware-based error recovery solution, *e.g.* Quach, Bigbee, Tu, Nguyen, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Kondo but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Kondo with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example, Kondo discloses a method which could handle both recoverable and non-recoverable errors. As Kondo explains “variations to the embodiments would be apparent to those skilled in the art and those variations would be within the scope and spirit of the present invention”. Kondo at [0216]. A POSA would have been motivated to look for references disclosing different methods on recoverable and non-recoverable errors handling which might be added or replace current approaches. Many of the

references cited herein provide additional or alternative solutions to Kondo, *e.g.* Klecka, Tu, Nguyen. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Kondo does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

g. Nguyen

Nguyen published on June 24, 2004, and qualifies as prior art at least under 35 U.S.C. § 102(a). The accompanying chart produced as Exhibit G provides examples of where Nguyen discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Nguyen does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Nguyen alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen
4. Quach
5. Durrant
6. Akai
7. Yamazaki
8. Oghuro
9. Tu
10. Safford
11. Bigbee
12. Kondo
13. Marisetty
14. Williams
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Nguyen with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Nguyen discloses the error recovery module and the reset module “may be implemented in whole or part as ... firmware ...”. Nguyen at [0020], [0022]. Nguyen also discloses employing “a layer of firmware called the processor abstraction layer (PAL)” for the recovery mechanism, same as the firmware approach disclosed in '958. Nguyen at [0045]. A POSA would have been motivated to look for detailed firmware based implementation solutions for similar functions, and many of the references cited herein provide a firmware-based error handling solution, *e.g.* Quach, Bigbee, Kondo, Tu, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Nguyen but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Nguyen with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example, Nguyen discloses a method which could handle both recoverable and non-recoverable errors. As Nguyen explains “persons skilled in the art of processor design, having the benefit of this disclosure, will recognize variations and modifications of the disclosed embodiments”. Nguyen at [0060]. A POSA would have been motivated to look for references disclosing different methods on recoverable and non-recoverable errors handling which might be added or replace current approaches. Many of the references cited herein provide additional or alternative solutions to Nguyen, *e.g.* Klecka, Tu, Kondo. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter

Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Nguyen does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

h. Oghuro

Oghuro issued on May 5, 1998, and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit H provides examples of where Oghuro discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Oghuro does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Oghuro alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen
4. Quach
5. Safford
6. Yamazaki
7. Nguyen
8. Durrant
9. Tu
10. Akai
11. Bigbee
12. Kondo
13. Marisetty
14. Williams
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Oghuro with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Ohguro discloses some recoverable error may “be corrected on the hardware”. Ohguro at 2:41-46. Ohguro also discloses

a “match control logic having means for controlling the operating mode of each of the processors” (i.e. duplex master or checker mode), and “re-operating the first and second processors” (i.e. recovering the processor pair to duplex mode). Ohguro at 3:20-49. Both disclosures disclose firmware based solutions, and a POSA seeking additional technical detail would have been motivated to look for firmware-based implementation solutions for similar functions, and many of the references cited herein provide a firmware-based soft error recovery solution, *e.g.* Quach, Bigbee, Kondo, Tu, Nguyen, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Ohguro but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Ohguro with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example, Ohguro discloses many types of errors including “correctable internal faults ... detected inside of a processor”, and “uncorrectable internal faults ...detected inside of a processor”, and “fixed faults ... determined by diagnosis in an initializing routine ... but cannot recovered”. Ohguro at 7:16-42. Ohguro further discloses the embodiment “operates to determine” if an internal fault is light or serious. *Id.* at 7:43-49. Ohguro’s focus on the fault-recovery process would have motivated a POSA to look for additional technical details on how to handle non-recoverable, serious, fixed faults which a fault tolerant system might encounter. This would have led the POSA to references disclosing both recoverable / non-recoverable errors handling, soft / hard errors handling, or transient / permanent errors handling. Many of the references cited herein provide a solution to detect different types of errors and handle accordingly, *e.g.* Klecka, Nguyen, Kondo, Tu. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Oghuro does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

i. Quach

Quach issued on September 23, 2003, and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit I provides examples of where Quach discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Quach does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Quach alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Oghuro
4. Bossen
5. Safford
6. Yamazaki
7. Nguyen
8. Durrant
9. Tu
10. Bigbee
11. Kondo
12. Marisetty
13. Williams
14. Akai
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Quach with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. Further, one of ordinary skill in the art would

not have limited herself to a specific technology when making modifications or improvements to the technology in Quach but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Quach with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example, Quach discloses a firmware based soft error recovery/correction routine. Quach also disclose “[p]ersons skilled in the art of processor design and having the benefit of this disclosure will recognize other variations on check unit 130 that may be activated to monitor results in execution cores 110 when processor 102 is in redundant mode”. Quach at 7:64-8:5. A POSA would be motivated to look for references disclosing both recoverable / non-recoverable errors handling, soft / hard errors handling, or transient / permanent errors handling. Many of the references cited herein provide a solution to detect different types of errors and handle accordingly, *e.g.* Klecka, Nguyen, Kondo, Tu. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Quach does not disclose one or more limitation(s) of the Asserted Claims of the ’958 patent.

j. Safford

Safford issued on August 1, 2006, from an application filed July 3, 2002, and qualifies as prior art at least under 35 U.S.C. § 102(a). The accompanying chart produced as Exhibit J provides examples of where Safford discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Safford does not anticipate the Asserted Claims of the ’958 patent, such claim would have been obvious based on Safford alone and also as combined or modified

with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen
4. Quach
5. Durrant
6. Yamazaki
7. Nguyen
8. Oghuro
9. Tu
10. Akai
11. Bigbee
12. Kondo
13. Marisetty
14. Williams
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Safford with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Safford discloses using external logic to detect mismatch error and trigger corresponding error recovery process. Safford at 3:10-20. A POSA would have been motivated to look for detailed firmware based implementation solutions for similar functions, and many of the references cited herein provide a firmware-based error handling solution, *e.g.* Quach, Bigbee, Kondo, Tu, Nguyen, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Safford but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Safford with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example, Safford discloses although the external logic could detect a mismatch, “[h]owever, which of the processors 111 and 113 is subject to an error condition may not be known” and sometime “an error condition may lead to a halt in processing of the processors 111

and 113 until the error can be corrected”. Safford at 3:10-20. A POSA would be motivated to look for references with improved solutions to avoid this situation when possible. Many of the references cited herein provide a solution for this exact situation, *e.g.* Klecka, Nguyen, Kondo, Tu. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Safford does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

k. Terayama

Terayama published in May 1993 and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit K provides examples of where Terayama discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Terayama does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Terayama alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen
4. Oghuro
5. Quach
6. Safford
7. Yamazaki
8. Nguyen
9. Durrant
10. Tu
11. Akai

12. Bigbee
13. Kondo
14. Marisetty
15. Williams

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Terayama with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Terayama discloses “the fault-tolerant functions is realized in both hardware consisting of many components, and software for the fault-tolerant system,” and the system “performs all the fault-tolerant operations without software support” and “requires no special program for fault-tolerance.” Terayama at 1. A POSA would be motivated to look for various implementation solutions for fault-tolerant functions such as soft error correction/recovery, especially firmware-based solutions, i.e., software embedded in hardware, and many of the references cited herein provide a firmware-based soft error recovery solution, *e.g.* Quach, Bigbee, Kondo, Tu, Nguyen, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Terayama but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Terayama with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example, Terayama discloses how to handle different types of permanent faults (non-recoverable) and transient faults (recoverable), and the types of faults partially relate to whether errors are detected in individual processors and whether there is a mismatch between processors. Terayama at 3-4. To seek additional implementation details, POSA would have been motivated to look for references disclosing both recoverable / non-recoverable errors handling, soft / hard errors handling, or transient / permanent errors handling. Many of the references cited herein provide a solution to detect different types of errors and handle accordingly, *e.g.* Klecka, Nguyen, Kondo,

Tu. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Terayama does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

I. Tu

Tu published on July 3, 2003, and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit L provides examples of where Tu discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Tu does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Tu alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen
4. Quach
5. Safford
6. Yamazaki
7. Nguyen
8. Durrant
9. Oghuro
10. Akai
11. Bigbee
12. Kondo
13. Marisetty
14. Williams
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Tu with any of the above-listed references because those references

disclosed detecting and resolving loss of lockstep. For example, Tu discloses the error recovery unit and the reset unit “may be implemented as firmware ...”. Tu at [0019], [0021], [0025]. A POSA would be motivated to look for detailed firmware based implementation solutions for similar functions, and many of the references cited herein provide a firmware-based error handling solution, *e.g.* Quach, Bigbee, Tu, Nguyen, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Tu but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Tu with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example. Tu discloses how to handle recoverable and non-recoverable errors, and a POSA would have been motivated to look for further disclosure on the outcome of recovery process. Many of the references cited herein provide a detailed description of the outcome, *e.g.* Nguyen, Klecka, Bigbee, Kondo, etc. Nguyen notably shares 4 inventors, including Tu, in common with Tu and implements a recovery solution on an identical or close-to-identical FRC-based system. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Tu does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

m. Williams

Williams issued on September 14, 1999, and qualifies as prior art at least under 35 U.S.C. § 102(b). The accompanying chart produced as Exhibit M provides examples of where Williams discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Williams does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Williams alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen
4. Quach
5. Durrant
6. Akai
7. Yamazaki
8. Oghuro
9. Tu
10. Safford
11. Bigbee
12. Kondo
13. Marisetty
14. Nguyen
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Williams with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Williams discloses after loss of lockstep, “software and/or hardware mechanisms act to reconfigure the fault tolerant computer system” Williams at 6:55-7:11. A POSA would have been motivated to look for various implementation solutions for the reconfiguration/recovery process, including firmware-based solutions, i.e., software embedded in hardware, and many of the references cited herein provide a firmware-based error recovery solution, *e.g.* Quach, Bigbee, Kondo, Tu, Nguyen, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Williams but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Williams with concepts from at least the various fault-tolerant technologies disclosed in the

references cited herein. For example, Williams focus on how to recover from a minor out-of-sync event in a lockstep pair. Williams at 2:13-27, 2:41-54. A POSA would have been motivated to look for references disclosing how to recover non-minor out-of-sync failure. Many of the references cited herein provide a solution to recover from loss of lockstep, *e.g.* Klecka, Nguyen, Kondo, Tu. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Williams does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

n. Yamazaki

Yamazaki issued on September 12, 2006, from an application filed July 8, 2003, and qualifies as prior art at least under 35 U.S.C. § 102(a). The accompanying chart produced as Exhibit N provides examples of where Yamazaki discloses, either expressly or inherently, each limitation of the Asserted Claims, thereby anticipating the claim.

If Foras asserts that Yamazaki does not anticipate the Asserted Claims of the '958 patent, such claim would have been obvious based on Yamazaki alone and also as combined or modified with concepts from other prior art such as, for example, the prior art listed and explained either earlier in this pleading, or in the accompanying charts, including:

1. Applicant Admitted Prior Art
2. Klecka
3. Bossen
4. Quach
5. Durrant
6. Akai
7. Nguyen
8. Oghuro
9. Tu

10. Safford
11. Bigbee
12. Kondo
13. Marisetty
14. Williams
15. Terayama

A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine Yamazaki with any of the above-listed references because those references disclosed detecting and resolving loss of lockstep. For example, Yamazaki discloses the recovery processing “can be realized not only by hardware but also by loading a re-synchronization processing program” Yamazaki at 16:24-30. A POSA would have been motivated to look for various implementation solutions for error recovery, including firmware-based solutions, i.e., software embedded in hardware, and many of the references cited herein provide a firmware-based error recovery solution, *e.g.* Quach, Bigbee, Kondo, Tu, Nguyen, Marisetty. Further, one of ordinary skill in the art would not have limited herself to a specific technology when making modifications or improvements to the technology in Yamazaki but would have been motivated by ordinary innovation, ordinary skill, and common sense to modify the technology in Yamazaki with concepts from at least the various fault-tolerant technologies disclosed in the references cited herein. For example, although Yamazaki focus on how to recover from a specific out-of-sync error in a lockstep pair, it discloses other errors which could cause a loss of lockstep (“step-out state”), *e.g.* “fixed failure”, “automatically correctable intermittent failure”. Yamazaki at 2:8-30. A POSA would be motivated to look for references disclosing how to recover the other types of recoverable and non-recoverable failure. Many of the references cited herein provide a solution to recover from loss of lockstep, *e.g.* Klecka, Nguyen, Kondo, Tu. Such modification would have been obvious to try and its results predictable. Moreover, design incentives and other market forces would have prompted those endeavors.

Kia reserves the right to supplement or amend these Initial Invalidity and Subject Matter Eligibility Contentions with additional positions on obviousness in response to any allegation by Foras that Yamazaki does not disclose one or more limitation(s) of the Asserted Claims of the '958 patent.

* * *

In addition to the specific prior art references and combinations of prior art references identified above, the further combination of these references and combinations with the background knowledge of a person of ordinary skill in the art at the time of the alleged invention render obvious the Asserted Claims of the '958 Patent.

2. Secondary Considerations

Subject to the reservation of rights stated above, Foras has not established the existence of any secondary considerations. Kia reserves the right to supplement these Initial Invalidity and Subject Matter Eligibility Contentions with respect to secondary considerations should Foras adequately identify such secondary considerations and/or their alleged nexus to the Asserted Claims.

“The fact of near-simultaneous invention, though not determinative of statutory obviousness, is strong evidence of what constitutes the level of ordinary skill in the art.” *Ecolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1379 (Fed. Cir. 2000) (quoting *Int’l Glass Co. v. United States*, 408 F.2d 395, 405 (1969)). “[T]he possibility of near simultaneous invention by two or more equally talented inventors working independently, ... may ... be an indication of obviousness when considered in light of all the circumstances.” *Id.* (quoting *Lindemann Maschinenfabrik GmbH v. Am. Hoist & Derrick Co.*, 730 F.2d 1452, 1460 (Fed. Cir. 1984)); see also *Geo M. Martin Co. v. All. Mach. Sys. Int’l LLC*, 618 F.3d 1294, 1305 (Fed. Cir. 2010) (“Independently made, simultaneous inventions, made ‘within a comparatively short space of

time,’ are persuasive evidence that the claimed apparatus ‘was the product only of ordinary mechanical or engineering skill.’” (citation omitted)). If any of the references in these Initial Invalidity and Subject Matter Eligibility Contentions is found not to be prior art to the ’958 patent, these references may be relied upon as evidence of near-simultaneous invention favoring obviousness.

Regardless, Kia is not aware of any evidence that: (1) Foras developed a product embodying the claimed subject matter of the Asserted Claims that has enjoyed commercial success; (2) the Asserted Claims are directed to any long felt but unresolved need; (3) the Asserted Claims address any failure of others; (4) there is teaching away from the claimed subject matter by the prior art; (5) the claimed subject matter of the Asserted Claims has been copied or acclaimed by others; or (6) experts would have been skeptical of the claimed approach or idea set forth in the Asserted Claims. Nor is Kia aware of any evidence that there is a nexus between any such secondary consideration and the Asserted Claims.

C. Grounds of Invalidity Other Than Anticipation or Obviousness

The Asserted Claims are also invalid for failure to meet one or more of the requirements of 35 U.S.C. § 112.

Kia reserves the right to amend, supplement, and/or otherwise modify these Invalidity and Subject Matter Eligibility Contentions with respect to grounds of invalidity other than anticipation or obviousness. Due in part to Foras’s failure to sufficiently identify (a) the full scope of the accused instrumentalities and (b) where Foras contends that each element of the Asserted Claims is found within each accused instrumentality, Kia lacks a complete understanding of Foras’s alleged infringement and/or claim construction positions. If and when Foras develops an infringement and/or claim construction theory that implicates infringement by Kia, Kia reserves the right to argue that the specification does not enable and/or provide a written description for

such an interpretation or that such an interpretation renders the claim indefinite. The Court has not yet construed any terms, phrases, or clauses of the Asserted Claims, and Foras has not yet provided any validity contentions in response to Defendants' Invalidity and Subject Matter Eligibility Contentions. In particular, Foras has not identified any way in which it disputes that the Asserted Claims are invalid under 35 U.S.C. § 112. Moreover, Kia's discovery and investigation in connection with this lawsuit is ongoing, and these grounds are based on information obtained to date. Accordingly, Kia reserves the right to amend, supplement, and/or otherwise modify these Invalidity and Subject Matter Eligibility Contentions. Kia further reserves the right to rely on expert reports or testimony and any third-party discovery.

Kia lists below exemplary grounds upon which Kia presently contends the Asserted Claims of the '958 patent are invalid for failure to meet one or more of the requirements of 35 U.S.C. § 112. Kia identifies at least the following grounds of invalidity based on inadequate written description under 35 U.S.C. § 112(a), lack of enablement under 35 U.S.C. § 112(a), and indefiniteness under 35 U.S.C. § 112(b) for the Asserted Claims. These grounds are identified based on knowledge currently in Kia's possession. A more detailed basis for Kia's written description, enablement, and/or indefiniteness defenses will be set forth in Kia's claim construction briefs and expert reports on invalidity, to be served in accordance with the Docket Control Order. Further investigation may uncover additional grounds for invalidity, and Kia reserves the right to supplement these disclosures to include all additional grounds.

1. Invalidity Under 35 U.S.C. § 112(a) (Written Description/Enablement)

Pursuant to 35 U.S.C. § 112(a), a patent specification:

shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make, and use the same[.]

The Federal Circuit has held that this language creates two closely related, yet separate requirements for a specification: (i) a written description of the invention (“written description”), and (ii) a written description of the manner and process of making and using the invention (“enablement”). *See Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1344 (Fed. Cir. 2010) (*en banc*).

The test for sufficiency of a patent’s written description requires:

an objective inquiry into the four corners of the specification from the person of ordinary skill in the art. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan to show that the inventor actually invented the invention claimed.

Ariad, 598 F.3d at 1351. A patent is invalid for inadequate written description unless “the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.*

The enablement requirement mandates that the disclosure in the specification describe “the manner and process of making and using [the invention], in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the [invention].” 35 U.S.C. § 112(a). For a patent’s specification to be enabling, it “must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’” *ALZA Corp. v. Andrx Pharms., LLC*, 603 F.3d 935, 940 (Fed. Cir. 2010) (quoting *Genetech Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997)).

Below is an exemplary list of claim elements¹ for which there is inadequate written

¹ Any discrepancy between the language included in the bullets of this paragraph and the language of the corresponding claim element is inadvertent, and it is Kia’s contention that the

description and/or lack of enablement under 35 U.S.C. § 112(a). For example, certain claim limitations fail to describe an invention understandable to a skilled artisan at the time of the invention and/or fail to show that the inventor actually possessed the invention claimed. *See Ariad*, 598 F.3d at 1351. As a further example, certain claims are invalid because the specification fails to teach those skilled in the art at the time of the alleged invention how to make and use the full scope of the claimed invention without undue experimentation. *See ALZA*, 603 F.3d at 940. As an additional example, certain claim limitations encompass any and all structures or acts for performing a recited function, including those beyond what their applicant(s) invented, such that the specification fails to provide a scope of enablement commensurate with the scope of the claim as asserted. *See Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S. 1, 12–13 (1946). As yet another example, certain claims are invalid for failing to enable the full scope of the invention as defined by the claims. *See Amgen Inc. v. Sanofi*, 143 S. Ct. 1243, 1254 (2023) (“If a patent claims an entire class of processes, machines, manufactures, or compositions of matter, the patent’s specification must enable a person skilled in the art to make and use the entire class.”).

In addition, and without limitation, the Asserted Claims taken as a whole (rather than only as the sum of its individual limitations) are invalid for lack of written description and enablement. *See, e.g., Novozymes A/S v. DuPont Nutrition Biosciences APS*, 723 F.3d 1336, 1346-51 (Fed. Cir. 2013). As described below, by way of example, a person of ordinary skill in the art at the time of the alleged invention would not understand that the named inventors of the ’958 patent were in possession of the claimed subject matter as of the effective filing date, nor would the patent’s disclosure have enabled one skilled in the art at the time of the alleged invention to practice the Asserted Claims without undue experimentation.

claim element is not adequately described and/or enabled under 35 U.S.C. § 112(a) and/or is indefinite under 35 U.S.C § 112(b).

Any deficiencies that render claims invalid for written description and/or enablement under 35 U.S.C. § 112 also infect and thereby invalidate any and all claims depending therefrom.

In addition to the claim as a whole, at least the following claim elements, or portions thereof, of the claims in the '958 patent are not supported by the written description and/or are not enabled under 35 U.S.C. § 112(a):

- Claims 1 and 19 of the '958 patent and any claims dependent therefrom are invalid for failure to satisfy the requirements of 35 U.S.C. § 112, ¶ 1 because the specification as filed does not contain an adequate written description and/or enabling disclosure of “determining if the lockstep is recoverable.” The description in the specification merely refers to “recoverable LOLs” as when “lockstep is recoverable for certain detected LOLs” without any further definition or explanation of how to determine when a lockstep is or is not recoverable. *See, e.g.*, '958 patent at 5:55-60, 9:55-60, 13:20-25. Accordingly, the specification fails to reasonably convey to one of ordinary skill that the inventor had possession of the subject matter of the invention, and it fails to enable a person of ordinary skill to make and use the invention as claimed.
- Claims 1, 13, 19, and 23 of the '958 patent and any claims dependent therefrom are invalid for failure to satisfy the requirements of 35 U.S.C. § 112, ¶ 1 because the specification as filed does not contain an adequate written description and/or enabling disclosure of “recover[ing] lockstep.” The specification discloses that recovering or reestablishing lockstep may be done by resetting the processor. '958 patent at 13:44-45. However, the specification acknowledges that resetting the processor may fail. *Id.* at 14:39-59. The specification does not disclose how to reliably recover and reestablish lockstep without undue experimentation and does not disclose how to recover lockstep using firmware code. Accordingly, the specification fails to reasonably convey to one of ordinary skill that the inventor had possession of the subject matter of the invention, and it fails to enable a person of ordinary skill to make and use the invention as claimed.
- Claim 8 of the '958 patent is invalid for failure to satisfy the requirements of 35 U.S.C. § 112, ¶ 1 because the specification as filed does not contain an enabling disclosure of “determining that the loss of lockstep is not recoverable.” The '958 Patent conclusorily states in Claim 8 that a “lockstep mismatch,” which the patentee defines as “detection of the output of the paired processors not matching,” means that lockstep cannot be recovered. It does not disclose anywhere *how* a lockstep mismatch informs the method of claim 1 that the lockstep cannot be recovered. Similarly, the '958 patent does not disclose anywhere in the specifications any method of ruling out the possibility that the loss of lockstep is recoverable *even if* a lockstep mismatch is detected.

- Claim 13 of the '958 patent and any claims dependent therefrom are invalid for failure to satisfy the requirements of 35 U.S.C. § 112, ¶ 1 because the specification as filed does not contain an enabling disclosure of “us[ing] an ACPI method to reintroduce the master processor to the operating system.” The description in the specification of using an ACPI method to reintroduce the master processor, *see* '958 patent at 6:55-7:20, fails to specify which ACPI method is to be used and accordingly fails to enable a person of ordinary skill to make and use the invention as claimed.
- Claims 1, 13, 19, and 23 of the '958 patent and any claims dependent therefrom are invalid for failure to satisfy the requirements of 35 U.S.C. § 112, ¶ 1 because the specification as filed does not contain an enabling disclosure of “firmware code ... for triggering an operating system to idle the processors.” The description in the specification of using an ACPI eject method to trigger an OS to idle processors, *see* '958 patent at 6:9-40, fails to specify how firmware code can utilize an ACPI eject method and accordingly fails to enable a person of ordinary skill to make and use the invention as claimed.
- Claims 1, 13, 19, and 23 of the '958 patent and any claims dependent therefrom are invalid for failure to satisfy the requirements of 35 U.S.C. § 112, ¶ 1 because the specification as filed does not contain an enabling disclosure of “detection of loss of lockstep.” The specification defines loss of lockstep as “any error in the pair of lockstep processors,” '958 patent at 2:27-28, but fails to disclose methods capable of detecting any error in the pair of lockstep processors. In fact, the specification readily admits that some errors will go “undetected” or “remain ‘silent.’” *Id.* at 2:60-65. Accordingly, the specification fails to reasonably convey to one of ordinary skill that the inventor had possession of the subject matter of the invention, and it fails to enable a person of ordinary skill to make and use the invention as claimed.

These elements fail to meet the written description requirement and/or are not enabled. The '958 patent would not convey to one of skill in the art that, as of the filing date, the inventor had possession of the claimed subject matter. Nor would the '958 patent teach one of ordinary skill in the art how to practice these claim elements without undue experimentation. To the contrary, the '958 patent recites only generic components in the embodiments disclosed. Additionally, the claims containing these limitations are invalid for failing to enable the full scope of the invention as defined by the claim.

2. Invalidity Under 35 U.S.C. § 112(b) (Indefiniteness)

Below is an exemplary list of claim elements² that are indefinite and/or render claims that include such elements indefinite under 35 U.S.C. § 112(b). For example, certain claim limitations “fail to inform, with reasonable certainty, those skilled in the art at the time of the alleged invention about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014); *see also Allen Eng’g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1348 (Fed. Cir. 2002) (quoting *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1377 (Fed. Cir. 2000) (“[F]irst, [the claim] must set forth what ‘the applicant regards as his invention’ and second, it must do so with sufficient particularity and distinctness, i.e., the claim must be sufficiently ‘definite.’”) (second alteration in original)).

Because Kia’s investigation, prior art search, analysis, discovery, and trial preparation are still ongoing, Kia expressly reserves the right to amend, supplement, and/or otherwise modify these Initial Invalidity and Subject Matter Eligibility Contentions, including by identifying and providing additional evidence and arguments that the Asserted Claims are indefinite under 35 U.S.C. § 112(b) following any constructions Foras propose or the Court adopts.

Any deficiencies that render claims invalid for indefiniteness under 35 U.S.C. § 112(b) also infect and thereby invalidate any and all claims depending therefrom.

At least the following claim elements, or portions thereof, used in the ’958 Patent are indefinite under 35 U.S.C. § 112(b) for failure to inform, with reasonable certainty, those skilled in the art about the scope of the invention:

² Any discrepancy between the language included in the bullets of this paragraph and the language of the corresponding claim element is inadvertent, and it is Kia’s contention that the claim element is not adequately described and/or enabled under 35 U.S.C. § 112(a) and/or is indefinite under 35 U.S.C. § 112(b).

- “detecting loss of lockstep for a lockstep pair of processors” (claim 1)
- “using firmware to trigger an operating system to idle the lockstep pair of processors, recover lockstep for the lockstep pair of processors, and trigger the operating system to recognize the lockstep pair of processors having recovered lockstep” (claim 1)
- “responsive to said detecting loss of lockstep, using said firmware to determine if lockstep is recoverable for the lockstep pair of processors, wherein said using said firmware to determine if lockstep is recoverable further comprises determining if a lockstep mismatch has occurred between the lockstep pair of processors” (claim 1)
- “using the firmware to trigger the operating system to idle a master processor of the lockstep pair of processors.” (claim 2)
- “using the firmware to trigger the operating system to recognize the master of the lockstep pair of processors.” (claim 3)
- “using the firmware to trigger the operating system to recognize the master of the lockstep pair of processors.” (claim 6)
- “if determined that a lockstep mismatch has occurred between the lockstep pair of processors, then determining that the loss of lockstep is not recoverable.” (claim 8)
- “firmware code, responsive to detection of loss of lockstep between the pair of lockstep processors, for determining if the lockstep is recoverable for the pair of lockstep processors, wherein said firmware code for determining if the lockstep is recoverable further comprises firmware code for determining if a lockstep mismatch has occurred between the pair of lockstep processors” (claim 19)
- “firmware code, responsive to determining that the lockstep is recoverable, for triggering an operating system to idle the processors, attempting to recover lockstep between the pair of processors, and if lockstep is successfully recovered between the pair of processors, triggering said operating system to recognize the processors as being available for receiving instructions” (claim 19)
- “code for resetting the pair of processors” (claim 20)

As used in the context of the claim language, these claim elements are indefinite for failure to inform, with reasonable certainty, those skilled in the art about the scope of the invention as claimed. Based on Kia’s present understanding of Foras’ Infringement Contentions, at least one or more of these claim terms, phrases, and limitations are indefinite because they are inconsistent with and broader than the alleged invention disclosed in the specification and during prosecution,

and given Foras' apparent constructions of the claims, any person of ordinary skill in the art at the time of the invention would not understand what is claimed with reasonable certainty, even when the claims are read in light of the specification and prosecution history.

For example, the specification fails to adequately disclose the claim terms "recover lockstep," "determining if lockstep is recoverable," "loss of lockstep," "idle," "firmware code," "resetting the pair of processors," and "triggering an operating system," and these claim terms are broader than the alleged invention disclosed in the specification.

Improper Negative Limitations.

A number of Asserted Claims attempt to claim the purported invention by excluding what the inventors did not invent rather than distinctly and particularly pointing out what they did invent. *See In re Schechter*, 205 F.2d 185, 98 USPQ 144 (CCPA 1953). Claims having improper negative limitations include those listed below. Each claim and its dependent claim(s) are invalid under 35 U.S.C. § 112(a) as well as 35 U.S.C. § 112(b) because they are not supported by the written description requirement:

- "then determining that the loss of lockstep is not recoverable" (claim 8 of the '958 patent). It is not reasonably certain how the above claim limitation occurs and if the above limitations occur before, during, or after the firmware attempts to recover loss of lockstep. The specification of the '958 patent only state "firmware 15 determines in block 101 whether the detected LOL is of a type from which the firmware can recover lockstep for the lockstep processor pair 12 without crashing the system." *See* '958 patent at 5:53-56. It is not reasonably certain what method is used for the determination or how many tries the firmware takes before determining that the detected LOL is not of a type that is recoverable. Accordingly, it is not reasonably certain how and when the above limitations are met.

3. Invalidity Under 35 U.S.C. § 112(f) (Means Plus Function)

The Asserted Claims of the Asserted Patent lack sufficient corresponding structure clearly linked to each of the claim phrases identified below that include "means plus function" or "step plus function" limitations, and are thus invalid under pre-AIA 35 U.S.C. § 112, sixth paragraph:

Claims	“Means Plus Function” Limitations
claim 19	“firmware code ... for determining if the lockstep is recoverable”; “firmware code for determining if a lockstep mismatch has occurred between the pair of lockstep processors”; “firmware code ... for triggering an operating system to idle the processors, attempting to recover lockstep between the pair of processors, and ... triggering said operating system to recognize the processors as being available for receiving instructions”
claim 20	“code for attempting to recover lockstep”; “code for resetting the pair of processors”

The limitations “firmware code for” (claim 19 of the ’958 patent) and “code for” (claim 20 of the ’958 patent) invoke pre-AIA 35 U.S.C. §112, sixth paragraph because these terms “do[] not connote sufficiently definite structure.” *See Cypress Lake Software, Inc. v. Samsung Elecs. Am., Inc.*, 382 F. Supp. 3d 586, 615 (E.D. Tex. 2019) (finding that four claim limitations using the phrase “code for ...” were means-plus-function limitations). Whether recitation of “code for” performing a function is governed by § 112, ¶ 6 depends on “whether one of ordinary skill in the art would understand the claim with the functional language, in the context of the entire specification, to denote sufficiently definite structure or acts for performing the function.” *See Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015) (§ 112, ¶ 6 does not apply when “the claim language, read in light of the specification, recites sufficiently definite structure”); *Cypress Lake*, 382 F. Supp. 3d at 615 (citing *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1319-21 (Fed. Cir. 2004)). Here, the terms “firmware code for” and “code for” are defined only by the functions they perform, specifically: “determining if the lockstep is recoverable”; “determining if a lockstep mismatch has occurred between the pair of lockstep processors”; “triggering an operating system to idle the processors, attempting to recover lockstep between the pair of processors, and ... triggering said operating system to recognize the processors as being available for receiving instructions”; “attempting to recover lockstep”; and “resetting the pair of processors.”

The surrounding claim language also does not identify any specific structure of “code” to perform the above recited functions. *See Cypress Lake*, 382 F. Supp. 3d at 615 (finding that “code for” terms are only defined by their functions and surrounding claim language does not identify specific structure of “code” to perform these functions).

Finally, as discussed under Section C.2., the specification of the ’958 patent fails to disclose any structure for performing the above recited functions. In the context of the entire specification, one of ordinary skill in the art would not understand the claim with the functional language to denote sufficiently definite structure or acts for performing the recited functions. In other words, there is “nothing in the specification [of the ’958 patent] to help cabin the scope of the functional language: The patentee has in effect claimed everything that [performs the functions] under the sun.” *Id.* at 616 (citing *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 519 (Fed. Cir. 2012)). Accordingly, the limitations “firmware code for” (claim 19 of the ’958 patent) and “code for (claim 20 of the ’958 patent) are means-plus-function limitations.

II. SUBJECT MATTER ELIGIBILITY CONTENTIONS

Kia produces as Attachment A charts identifying each exception to eligibility to which the Asserted Claims is directed and the factual and legal basis therefor and describing the industry, at the relevant time, in which the Asserted Claims is alleged to be well understood, routine, and conventional, as well as describing how each element of the Asserted Claims, both individually and in combination with the other elements of the claim, was well understood, routine, and conventional, and the factual and legal basis therefor.

In instances where Kia cites a particular figure or table in a reference, the citation should be understood to encompass the caption and description of the figure or table and any text relating to that figure or table. Similarly, where a cited portion of text refers to a figure or table, the citation should be understood to include the figure or table as well.

Kia reserves the right to amend, supplement, and/or otherwise modify these Initial Invalidity and Subject Matter Eligibility Contentions. Among other things, Kia's investigation and discovery, including third-party discovery, in connection with this lawsuit is ongoing, and these contentions are based on information obtained to date. The Court has not yet construed any terms or phrases of the Asserted Claims, and Foras has not provided any validity contentions in response to any of Kia's invalidity and subject matter eligibility contentions. In particular, Foras has not identified any way in which it disputes that the Asserted Claims are invalid based on subject matter eligibility. Accordingly, Kia reserves the right to amend, supplement, and/or otherwise modify these Initial Invalidity and Subject Matter Eligibility Contentions.

A. Invalidity Under 35 U.S.C. § 101 (Ineligible Subject Matter)

The Asserted Claims is invalid as unpatentable under 35 U.S.C. § 101 for the reasons set forth below.³

Kia reserves the right to amend, supplement, and/or otherwise modify these Invalidity and Subject Matter Eligibility Contentions with respect to grounds of subject matter eligibility. Due, in part, to Foras's failure to identify sufficiently (a) the full scope of the accused instrumentalities and (b) where Foras contends that each element of each Asserted Claims is found within each accused instrumentality, Kia lacks a complete understanding of Foras's alleged infringement and/or claim construction positions. If and when Foras develops an infringement and/or claim construction theory that implicates infringement by Kia, Kia reserves the right to argue that such an interpretation renders the subject matter of the '958 patent ineligible. The Court has not yet construed any terms, phrases, or clauses of the Asserted Claims, and Foras has not yet provided

³ Any discrepancy between the language included in this section and the language of the corresponding claim element is inadvertent, and it is Kia's contention that the claim element is an ineligible subject matter under 35 U.S.C. § 101.

any validity or infringement contentions in response to Defendants' Invalidity and Subject Matter Eligibility Contentions. In particular, Foras has not identified any way in which it disputes that the Asserted Claims is invalid under 35 U.S.C. § 101. Moreover, Kia's discovery and investigation in connection with this lawsuit is ongoing, and these grounds are based on information obtained to date. Accordingly, Kia reserves the right to amend, supplement, and/or otherwise modify these Invalidity and Subject Matter Eligibility Contentions. Kia further reserves the right to rely on expert reports or testimony and any third-party discovery.

Kia lists below exemplary grounds upon which Kia presently contends the Asserted Claims of the '958 patent is invalid for failure to meet one or more of the requirements of subject matter eligibility under 35 U.S.C. § 101. These grounds are identified based on knowledge in Kia's possession at this time. A more detailed basis for Kia's ineligible subject matter will be set forth in Kia's claim construction briefs and expert reports on invalidity, to be served in accordance with the schedule set forth in the Court's Docket Control Order. Further investigation may uncover additional grounds for invalidity, and Kia reserves the right to supplement these disclosures to include all additional grounds.

Pursuant to 35 U.S.C. § 101, a patentable invention shall be:

Any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof[.]

More specifically, the Supreme Court has held that patent claims are ineligible if they (1) focus on an abstract idea and (2) add nothing significantly more (*i.e.*, nothing inventive) to that idea. *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216–18 (2014). First, the Court determines whether the claims are directed to an abstract idea despite incorporating computers. *Id.* at 218. The Court evaluates the “focus of the claims” to determine if the claims’ “character as a whole is directed to [an abstract idea],” such as a longstanding human concept or activity. *ChargePoint, Inc. v.*

SemaConnect, Inc., 920 F.3d 759, 765, 769 (Fed. Cir. 2019). Second, the Court determines whether other claim elements, individually or collectively, add “significantly more”—something “inventive.” *Alice*, 573 U.S. at 217–22.

The inventive concept cannot stem from the abstract idea itself. *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1163 (Fed. Cir. 2018). Implementing an abstract idea in a “particular technological environment” with conventional computer and network technology is also “insufficient.” *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354–55 (Fed. Cir. 2016). As is incorporating conventional hardware components. *In re TLI Commc’ns LLC Patent Litig.*, 823 F.3d 607, 612 (Fed. Cir. 2016). And claims cannot rely on “generic functional language to achieve [the] purported solutions” without claiming “*how* the desired result is achieved.” *Two-Way Media Ltd. v. Comcast Cable Commc’ns, LLC*, 874 F.3d 1329, 1339 (Fed. Cir. 2017).

Below is an exemplary list of claims that the Federal Circuit has routinely held ineligible, including claims for: (1) “providing notification” of data abnormalities identified by analyzing “activities” performed on a computer, such as “accesses during a predetermined time interval” or “by a specific user,” *FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1092, 1095 (Fed. Cir. 2016); (2) “[a]n automated notification system” that “monitors” an object to provide location-based information to a user through a “personal communication device,” *Elec. Commc’n Techs., LLC v. ShoppersChoice.com, LLC*, 958 F.3d 1178, 1180 (Fed. Cir. 2020); and (3) “detecting events” based on analysis of “real-time” electrical grid data and displaying results, *Elec. Power Grp.*, 830 F.3d at 1351–52.

Additionally, adding “conventional” components and applications to a “particular technological environment” fails to supply an inventive concept sufficient to render the Asserted Claims eligible. *Elec. Power Grp.*, 830 F.3d at 1354–55.

1. *Alice* Step One: The Asserted Claims are Directed to an Abstract Idea

The Asserted Claims are directed to an abstract idea. For example, the Asserted Claims are directed to the abstract idea of detecting an error, pausing to determine if the error is correctable, and if so correcting the error. People have engaged in such ideas for centuries and using generic computers and computer elements as in the Asserted Claims to carry them out does not make them patent eligible. Indeed, the specification of the '958 patent "makes clear that the recited physical components merely provide a generic environment in which to carry out the abstract idea." *TLI Communs. LLC v. AV Auto., L.L.C. (In re TLI Communs. LLC Patent Litig.)*, 823 F.3d 607, 611 (Fed. Cir. 2016). The Asserted Claims do not claim any improved functionality of the generic computers and components used to implement the abstract idea. Nor do the Asserted Claims provide a solution to any technological problem.

Other than the abstract idea, the limitations of the Asserted Claims amount to nothing more than well-understood, routine, and conventional aspects of using duplicate, redundant processors to detect and recover from errors, performing steps in the order that one would expect them to be performed. The specification of the '958 patent, issued years before the Supreme Court's *Alice* decision, describes checking for errors while processing data. It purports to improve known methods by using firmware to involve the operating system in recovering from detected errors to avoid crashing the system in the case of a recoverable fault. It discloses "a method [of] detecting loss of lockstep for a pair of processors," "triggering, by firmware, an operating system to idle the processors, and recovering, by the firmware, lockstep between the pair of processors." '958 Patent at 3:51-54. "After lockstep is recovered between the pair of processors, the method further comprises triggering, by the firmware, the operating system to recognize the processors as being available for receiving instructions." *Id.* at 3:54-59.

a. The Claims are Directed to the Abstract Idea of Detecting an Error, Pausing to Determine if the Error Is Correctable, and if so Correcting the Error

The claims recite nothing more than the abstract idea of detecting an error, pausing to determine if the error is correctable, and if so correcting the error. This abstract idea embodies the “character as a whole” of the claims. *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015) (“the claims are considered in their entirety to ascertain whether their character as a whole is directed to excluded subject matter”). Claim 1 recites only generic elements, each of which is expressed solely by its function. The method is directed to “detecting loss of lockstep for a lockstep pair of processors.” The function of generic “firmware” is to “trigger an operating system to idle the lockstep pair of processors, recover lockstep for the lockstep pair of processors, and trigger the operating system to recognize the lockstep pair of processors having recovered lockstep.” The firmware is also used to “determine if lockstep is recoverable for the lockstep pair of processors.” All of these limitations are captured by the abstract idea of detecting an error, pausing to determine if the error is correctable, and if so correcting the error.

As illustrated above, the claims are drafted at a high level of abstraction and are “untethered to any specific or concrete way of implementing” the invention. *Affinity Labs of Texas LLC v. DirecTV*, 838 F.3d 1253, 1258 (Fed. Cir. 2016). The claims do not say how to detect a loss of lockstep, how to use firmware to trigger an operating system to idle, recover, and recognize the lockstep pair of processors, or how to use firmware to determine if lockstep is recoverable.

b. The Claims Can Be Performed Entirely in the Human Mind

The abstractness of the idea claimed in the ’958 patent is also supported by the fact that it can be “performed entirely in the human mind.” See *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1371 (Fed. Cir. 2011) (“methods which can be performed mentally, or which are the equivalent of human mental work, are unpatentable abstract ideas”); *Synopsys, Inc. v. Mentor*

Graphics Corp., 839 F.3d 1138, 1146-47 (Fed. Cir. 2016) (“we continue to ‘treat[] analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract-idea category’”) (quoting *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016)). Automating a method that can be “performed entirely in the human mind” with a computer does not render the abstract idea patent-eligible. *FairWarning IP, LLC v. Iatric Sys.*, 839 F.3d 1089, 1094 (Fed. Cir. 2016) (claims were abstract and patent ineligible “where the claimed computer-automated process and the prior method were carried out in the same way”).

For instance, the ’958 patent discloses determining loss of lockstep by performing the same calculation simultaneously in parallel and then checking the outputs to determine if they match. If the outputs fail to match, then a loss of lockstep has occurred. Such a process can be performed by two humans with no knowledge of fault tolerance or error detection. It is natural to imagine two humans performing the same series of calculations on the same inputs, such as multiplying 5 by 2, and then comparing their outputs to determine if an error (loss of lockstep) has occurred. If one human obtains a result of 10, but another human obtains a result of 9, then there is a mismatch and the error needs to be corrected. The ’958 patent discloses recovering lockstep for the lockstep pair of processors by resetting and reinitializing both processors. This is equivalent to the two humans deciding to start over and redo their calculations from the beginning. In the example above, the two humans would erase all of their work and calculate 5 times 2 again.

c. The Claims Do Not Recite Any Technological Solution to a Technological Problem

The focus of the eligibility inquiry is whether the claims recite a specific solution to a real-world technological problem. “In cases involving software innovations, this inquiry often turns on whether the claims focus on the specific asserted improvement in computer capabilities or, instead,

on a process that qualifies as an abstract idea for which computers are invoked merely as a tool.” *Koninklijke KPN N.V. v. Gemalto M2M GmbH*, 942 F.3d 1143, 1149 (Fed. Cir. 2019). “[T]echnological details set forth in the patent's specification and not set forth in the claims” are insufficient for eligibility. *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d at 1322. “[T]he level of detail in the specification does not transform a claim reciting only an abstract concept into a patent-eligible system or method.” *Accenture*, 728 F.3d at 1345; *see also, e.g., Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1242 (Fed. Cir. 2016) (“The difficulty of the programming details for this functionality is immaterial because these details are not recited in the *actual claims*.”) (emphasis added); *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1334 (Fed. Cir. 2012) (“In considering patent eligibility under § 101, one must focus on the *claims*.”) (emphasis added).

The claims are purportedly directed to improving a computer system’s ability to recover from a recoverable loss of lockstep without crashing the system. However, the claims do not recite a specific solution to this problem nor do they improve the actual functionality of a computer system. Claim 1, as discussed above, describes with functional language the intended result (“using firmware to ... recover lockstep”) instead of reciting a specific solution. That should be dispositive. But even the specification fails to disclose a specific improvement over preexisting technology.

The specification discloses using “error detect logic,” which “include known parity-based mechanisms and ECC mechanisms” or “an XOR (exclusive OR) gate for detecting ... [when] the output of a master processor 12A and slave processor 12B fail[] to match.” ’958 Patent at 4:37-50. As the specification admits, none of the “error detect logic” disclosed was novel or not already present in the prior art, and therefore cannot be an improvement in the actual functionality of a computer system.

The specification discloses using firmware to determine “whether the detected LOL (loss

of lockstep) is a recoverable LOL,” but does not define which “certain detected LOLs” are recoverable. *Id.* at 5:55-61. Once a “recoverable LOL” has been somehow identified (neither the specification nor the claims disclose how this is determined), the specification discloses “reset[ting] the processor pair” “to recover lockstep for the lockstep processor pair.” *Id.* at 6:40-43. Resetting a processor pair was well-known, routine and conventional. *See, e.g.*, U.S. Patent No. 5,748,873 (“Ohguro”) at Abstract (“the processors are re-synchronized by a processor reset”). The ’958 patent did not disclose an improved method of resetting a processor pair.

After recovering lockstep via resetting the processors, the specification discloses using firmware to “reintroduce[] master processor 12A to OS 11” by “updat[ing] the ACPI device table information for master processor 12A to indicate that such master processor 12A is ‘present, functioning and enabled’” according to “the ACPI 2.0 specification.” ’958 Patent at 6:55-62. The Advanced Configuration and Power Interface (ACPI) open standard was first released in December 1996 with version 2.0 released in July 2000.⁴ Reintroducing a processor to the operating system using ACPI was well-known, routine and conventional.⁵ The specification merely used conventional, routine methods and did not disclose an improved method of reintroducing a processor to a OS. The specification discloses “utiliz[ing] an ACPI method 107 to trigger OS 11 to ‘check for’ master processor 12A, thereby reintroducing master processor 12A to OS 11.” ’958 Patent at 7:7-10. Using an ACPI method, a common industry standard at the time, to trigger an OS to check for a processor was well-known, routine and conventional. ’958 Patent at 8:17 (“ACPI

⁴ <https://uefi.org/acpi/specs>; https://uefi.org/sites/default/files/resources/ACPI_2.pdf. (“The ACPI open standard for device configuration and power management by the OS was first released in December 1996.”).

⁵ https://uefi.org/sites/default/files/resources/ACPI_2.pdf (“The Advanced Configuration and Power Interface (ACPI) specification was developed to establish industry common interfaces enabling robust operating system (OS)-directed motherboard device configuration and power management of both devices and entire systems.”).

standards”). The specification did not disclose an improved method of checking for a processor.

Compared with the prior art, the Asserted Patent’s alleged improvement over pre-existing technology is its ability to recover from loss of lockstep without using an “OS-centric” solution, thereby preventing system crashes in a wide variety of platforms without requiring specific knowledge of each OS. ’958 Patent at 3:4-47. However, many pre-existing methods for recovering lockstep errors already existed, such as resetting the processor, ’873 Patent (“Ohguro”) at Abstract, reinitializing the processor state from a prior saved state, ’582 Patent (“Klecka”) at Abstract, retrying the operation, ’491 Patent (“Bossen”) at Abstract, and updating corrupted processor state data with uncorrupted data, ’749 Patent (“Quach”). The Asserted Claims simply use only generic elements, each of which is expressed solely by its function, and do not recite any specific solution to a technological problem. That alone is dispositive. Even looking to the specification, all of the disclosed methods were well-known, routine, and conventional. Unlike in *Koninklijke*, where the asserted patent disclosed “a specific solution” for “catching previously undetectable system errors ... by varying the way check data is generated by modifying the permutation applied to different data blocks,” the ’958 Patent does not disclose a specific solution for improving a computer system’s ability to recover from a recoverable loss of lockstep without crashing the system. *Koninklijke KPN N.V. v. Gemalto M2M GmbH*, 942 F.3d 1143, 1151 (Fed. Cir. 2019).

2. *Alice* Step Two: The Claims Lack an Inventive Concept

The claims lack any inventive concept and instead involve only the use of unspecified, generic computer components functioning in their routine and conventional manner to carry out the claimed abstract idea without providing any improvement to the preexisting technology. For example, as discussed above, the ’958 patent discloses using “standard firmware” such as “Processor Abstraction Layer (PAL), System Abstraction Layer (SAL), and Extended Firmware Interface (EFI)” to “provide standard, published procedure calls.” ’958 patent at 5:24-26, 5:43-44,

8:1. These include “well-known functions” such as “performing I/O configuration accesses to discover and program the I/O Hardware,” “retrieving error log data from the platform following a Machine Check Abort (MCA) event,” and “accessing persistent store configuration data stored in non-volatile memory.” *Id.* at 5:30-40. “[I]f the lockstep is determined to be recoverable, firmware **15** cooperates with OS **11** via *standard* OS methods to recover the lockstep.” *Id.* at 5:66-6:1 (emphasis added). The Asserted Claims use “standard firmware” and “standard OS methods,” generic computer components functioning in their routine and conventional manner, to determine if lockstep is recoverable and if so, recover lockstep.

As another example, the specification discloses an “OS **11** mak[ing] ACPI calls to parse ACPI tables to discover the other processors of a multi-processor system in a manner as is well-known in the art.” *Id.* at 8:8-11. After discovering the processors, the OS **11** may employ “well-known firmware functions” to initialize the system hardware. *Id.* at 8:23-25. The ACPI table, also known as a “device tree,” is used to recover lockstep. *Id.* at 8:60-9:10. The processors can be “from the Itanium Processor Family (IPF),” “a well-known family of processors.” *Id.* at 5:4-8.

To determine whether a loss of lockstep has occurred, the specification discloses using “error detect logic,” such as “known parity-based mechanisms and ECC mechanisms” or “an XOR (exclusive OR) gate.” *Id.* at 4:44-48.

As shown by the examples above, the specification admits that the claimed components are known, conventional, generic, and typical computer components functioning in their routine and conventional manner to carry out the claimed abstract idea without providing any improvement to the preexisting technology.

The Federal Circuit has in many instances held that such claims lack an inventive concept where they recite nothing but broad, “generic descriptions of well-known computer components”

like the “firmware,” “operating system,” and “processors” generically recited in the ’958 patent claims. *See, e.g., Affinity Labs of Texas LLC v. Amazon.com, Inc.*, 838 F.3d 1266, 1270 (Fed. Cir. 2016); *In re TLI Communications LLC Patent Litig.*, 823 F.3d 607, 614 (Fed. Cir. 2016) (“These steps fall squarely within our precedent finding generic computer components insufficient to add an inventive concept to an otherwise abstract idea”); *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2015) (“At best, the claims describe the automation of the [abstract idea] through the use of generic-computer functions”). Furthermore, the Asserted Claims simply consisted of “conventional steps, specified at a high level of generality, which are well known in the art and consist of well-understood, routine, conventional activities previously engaged in by workers in the field,” which “is not sufficient to supply the inventive concept.” *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1313 (Fed. Cir. 2016).

III. ACCOMPANYING DOCUMENT PRODUCTION

Pursuant to the Scheduling Order, Kia is producing and/or providing for inspection, alongside their Initial Invalidity and Subject Matter Eligibility Contentions, the known invalidating references referred to herein and in the accompanying claim charts at production numbers PRIOR_ART_00000001-573 (available for inspection at Latham & Watkins LLP, 555 Eleventh Street, NW, Suite 1000, Washington, DC 20004-1304). For any such item that is not in English, an English translation of the portion(s) relied upon has been or will be produced.

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Respectfully submitted,

/s/ Adam M. Greenfield

Melissa R. Smith (TX SBN 24001351)

melissa@gillamsmithlaw.com

GILLAM & SMITH, LLP

303 South Washington Avenue

Marshall, Texas 75670

Tel: +1.903.934.8450

Fax: +1.903.934.9257

Douglas E. Lumish (CA SBN 183863)

doug.lumish@lw.com

LATHAM & WATKINS LLP

140 Scott Drive

Menlo Park, CA 94025

Tel: +1.650.328.4600

Fax: +1.650.463.2600

Adam M. Greenfield (DC SBN 998485)

adam.greenfield@lw.com

Jacob C. Vannette (DC SBN 1643659)

jake.vannette@lw.com

LATHAM & WATKINS LLP

555 Eleventh Street, NW, Suite 1000

Washington, DC 20004

Tel: +1.202.637.2200

Fax: +1.202.637.2201

*Attorneys for Defendants Kia Corporation
and Kia America, Inc.*

CERTIFICATE OF SERVICE

I hereby certify that I caused copies of the foregoing document to be served on September 15, 2023, upon the following via electronic mail:

Brett E. Cooper (NY SBN 4011011)
bcooper@bc-lawgroup.com
Seth Hasenour (TX SBN 24059910)
shasenour@bc-lawgroup.com
Drew B. Hollander (NY SBN 5378096)
dhollander@bc-lawgroup.com
Jonathan Yim (NY SBN 5324967)
jyim@bc-lawgroup.com
BC LAW GROUP, P.C.
200 Madison Avenue, 24th Floor
New York, NY 10016
Tel: (212) 951-0100
Fax: (646) 293-2201

/s/ Adam M. Greenfield
Adam M. Greenfield
Attorney for Defendants