UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZETEC, INC.
Petitioner
v.

WESTINGHOUSE ELECTRIC CO.
Patent Owner

Case IPR2014-00384
Patent 6,823,269

AMENDED PETITION FOR *INTER PARTES* REVIEW UNDER 37 C.F.R. § 42.100

Pursuant to Paper No. 4, mailed February 3, 2014, Petitioner Zetec, Inc. submits this Amended Petition in which constructions for certain claim terms are given per 37 C.F.R. 42.104(b)(3) in Section III(B)(3) herein. No substantive changes have been made to the Petition.

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EXHIBIT LIST

Exhibit	Description
1001	U.S. Patent No. 6,823,269 ("the '269 Patent")
1002	Sullivan, S.P. "Guidelines for Qualifying Eddy Current Technology for CANDU Steam Tube Inspection", CANDU Owners Group (COG) R&D Program: Technical Committee No. 19, WPIR 1987, COG-98-371-I, March 1999
1003	Sullivan, S.P., et al. "Applying Computer Modeling to Eddy Current Signal Analysis for Steam Generator and Heat Exchange Tube Inspections", AIP Conference Proceedings 509, 401 (2000)
1004	Cecco et al. "Eddy Current Performance Demonstration for CANDU Steam Generators"' ISG_TIP2 Task Coordination Group Meeting at Argonne National Laboratory, October 19-23, 1998
1005	U.S. Patent No. 4,194,149 ("Holt")
1006	U.S. Patent No. 4,867,168 ("Stoor")
1007	U.S. Patent No. 4,920,491 ("Eberhard et al.")
1008	U.S. Patent No. 4,942,545 ("Sapia")
1009	U.S. Patent No. 5,371,462 ("Hedengren et al.")
1010	U.S. Patent No. 5,434,571 ("Erle")
1011	U.S. Patent No. 6,566,871 ("Hölzl")
1012	U.S. Patent No. 4,763,274 ("Junker et al.")
1013	U.S. Patent No. 5,623,204 ("Wilkerson")
1014	EP 0 990 897 ("Winslow")
1015	Wang, X. et al. "On the Assessment of Through-Wall Circumferential Cracks in Steam Generator Tubes with Tubes Supports", Journal of Pressure Vessel Technology, 2003; 125(1):85
1016	Entergy Report, "Operational Assessment of ANO-2 Steam Generator Tubing for the Remainder of Cycle 14", February 3, 2000
1017	Declaration of Sean P. Sullivan
1018	Begley, J.A. et al., "Depth Based Structural Analysis Methods of SG Circumferential Indications", TR-107197-P1 Interim Report, December 1997
1019	Amended Complaint (*Westinghouse Electric Company, LLC v. Zetec, Inc.* (Civil Action No. 2:13-cv-01124-NBF W.D. Pennsylvania))

On behalf of Zetec, Inc. ("Zetec") and in accordance with 35 U.S.C. §311 and 37 C.F.R. §41.100, *inter partes* review is respectfully requested for claims 1-18 of U.S. Patent No. 6,823,269 ("the '269 Patent") (Ex. 1001).

I. MANDATORY NOTICES UNDER 37 C.F.R. §42.8(a)(1)

As set forth below and pursuant to 37 C.F.R. §42.8(a)(1), the following mandatory notices are provided as part of this Petition.

A. Real Party-In-Interest Under 37 C.F.R. §42.8(b)(1)

Zetec, Inc. is the real party-in-interest for Petitioner.

B. Related Matters Under 37 C.F.R. §42.8(b)(2)

The '269 Patent is presently the subject of a patent infringement lawsuit brought by the assignee, Westinghouse LLC, against Zetec, Inc., captioned *Westinghouse LLC v. Zetec, Inc.*, United States District Court for the Western District of Pennsylvania, Case No.: 2:13-cv-01124 (Ex. 1019). Petitioner is not aware of any judicial proceedings that may affect, or be affected by a decision in this proceeding.

C. Lead and Back-Up Counsel Under 37 C.F.R. §42.8(b)(3)

Pursuant to 37 C.F.R. §§42.8(b)(3) and 42.10(a), Petitioner provides the following designation of counsel.

Lead Counsel	Back-Up Counsel
Manny D. Pokotilow (Reg. No. 22492) mpokotilow@crbcp.com Postal and Hand-Delivery Address: CAESAR, RIVISE, BERNSTEIN, COHEN & POKOTILOW, LTD. 1635 Market Street 7 Penn Center – 12th Floor Philadelphia, PA 19103-2212 (P) 215-567-2010 - (F) 215-751-1142	Nicholas Tinari (Reg. No. 58,200) nmtinari@crbcp.com Postal and Hand-Delivery Address: CAESAR, RIVISE, BERNSTEIN, COHEN & POKOTILOW, LTD. 1635 Market Street 7 Penn Center – 12th Floor Philadelphia, PA 19103-2212 (P) 215-567-2010 - (F) 215-751-1142

Pursuant to 37 C.F.R. §42.10(b), a Power of Attorney accompanies this Petition.

D. Service Information Under 37 C.F.R. §42.8(b)(4)

Service information for lead and back-up counsel is provided in the designation of lead and back-up counsel, above. Service of any documents via hand-delivery may be made at the postal mailing address of the respective lead or back-up counsel designated above.

II. PAYMENT OF FEES UNDER 37 C.F.R. §42.103

The undersigned authorizes the Office to charge $24,200.00 to Deposit Account No. 03-0075 for the fees set forth in 37 C.F.R. §42.15(a) for this Petition for *Inter Partes* Review. Eighteen claims are being reviewed, so no excess claim fees are required. The undersigned further authorizes payment for any additional fees that might be due in connection with this Petition to be charged to the above-referenced Deposit Account.

III. REQUIREMENTS FOR *INTER PARTES* REVIEW UNDER 37 C.F.R. §42.104

As set forth below and pursuant to 37 C.F.R. §41.104, each requirement for *inter parties* review of the '269 Patent is satisfied.

A. Grounds for Standing Under 37 C.F.R. §42.104(a)

Petitioner hereby certifies that the '269 Patent is available for *inter partes* review and that the Petitioner is not barred or estopped from requesting *inter partes* review challenging the claims of the '269 Patent on the grounds identified herein. More particularly, Petitioner certifies that (1) Petitioner is not the owner of the '269 Patent; (2) Petitioner has not filed a civil action challenging the validity of a claim of the '269 Patent; (3) this Petition is filed less than one year after the date on which Petitioner, the Petitioner's real party-in-interest, or a privy of the Petitioner was served with a complaint alleging infringement of the '269 Patent; (4) the estoppel provisions of 35 U.S.C. §315(e) (1) do not prohibit this *inter partes* review; and (5) this Petition

is filed after the later of (a) the date that is nine months after the date of the grant of the '269 Patent or (b) the date of termination of any post-grant review of the '269 Patent.

B. Identification of Challenge Under 37 C.F.R. §42.104(b) and Relief Requested

The precise relief requested by Petitioner is that claims 1-18 of the '269 Patent are found unpatentable.

1. Claims for Which *Inter Partes* Review is Requested Under 37 C.F.R. §42.104(b)(1)

Petitioner requests *inter partes* review of claims 1-18 of U.S. Patent No. 6,823,269.

2. The Specific Art and Statutory Ground(s) on Which the Challenge is Based Under 37 C.F.R. §42.104(b)(2)

Inter parties review of the '269 Patent is requested in view of the following references: (1) Guidelines for Qualifying Eddy Current Technology for CANDU Steam Tube Inspection ("Sullivan") (Ex. 1002); (2) Applying Computer Modeling to Eddy Current Signal Analysis for Steam Generator and Heat Exchanger Tube Inspections. ("Sullivan et al.") (Ex. 1003); (3) Cecco, V.S. and Sullivan, S.P. Presentation slides dated Oct. 19-23, 1998. ISG_TIP2 Task Coordinating Group Meeting at Argonne National Laboratory. ("Cecco et al.") (Ex. 1004); (4) U.S. Patent no. 4,194,149. Method for Generating the Eddy Current Signature of a Flaw in a Tube Proximate a Contiguous Member Which Obscures the Flaw Signal. ("Holt") (Ex. 1005); (5) U.S. Patent no. 4,867,168. Apparatus for Simulating Inspection Equipment. ("Stoor") (Ex. 1006); (6) U.S. Patent no. 4,920,491. Enhancement of Image Quality by Utilization of A Priori Information. ("Eberhard et al.") (Ex. 1007); (7) U.S. Patent no. 4,942,545. Calibration of Eddy Current Profilometry. ("Sapia") (Ex. 1008); (8) U.S. Patent no. 5,371,462. Eddy Current Inspection Method Employing a Probe Array with Test and Reference Data acquisition and Data Processing. ("Hedengren et al.") (Ex. 1009); (9) U.S. Patent no. 5,434,571. Radar Target

Simulator. ("Erle") (Ex. 1010); (10) U.S. Patent no. 6,566,871. Process and Device for Testing A Workpiece by Means of Eddy Currents. ("Hölzl") (Ex. 1011); (11) U.S. Patent No. 4,763,274. Machine Implemented Analysis of Eddy Current Data. ("Junker et al.") (Ex 1012); (12) U.S. Patent No. 5,623,204. Eddy Current Probe. ("Wilkerson") (Ex. 1013); (13**)** EP 0 990 897 A2. Method and System for Determining Pipeline Defects. ("Winslow") (Ex. 1014); (14) Depth Based Structural Analysis Methods for SG Circumferential Indications ("Begley et al.") (Ex. 1018);

Each of the patents and non-patent publications listed above is prior art to the '269 Patent under 35 U.S.C. §§ 102(a), (b), and/or (e), as established in Section V(A), below.

Claim	Proposed Statutory Rejections for the '269 Patent
1	Claim 1 is anticipated under 35 USC 102(b) by Sullivan.
1	Claim 1 is anticipated under 35 USC 102(b) by Begley et al.
1	Claim 1 is anticipated under 35 USC 102b) by Hölzl.
1	Claim 1 is obvious under 35 USC 103(a) over Hedengren et al. in view of Hölzl, Junker et al., Begley et al., or Sullivan.
1	Claim 1 is obvious under 35 USC 103(a) over Holt in view of Junker et al., Sullivan or Begley et al.
1	Claim 1 is obvious under 35 USC 103(a) over Eberhard et al.
2	Claim 2 is anticipated under 35 USC 102(b) by Begley et al.
2	Claim 2 is anticipated under 35 USC 102(b) by Hölzl.
2	Claim 2 is obvious under 35 USC 103(a) over Sullivan in view of any of Sapia, Junker et al, Winslow or Hölzl.
3	Claim 3 is anticipated under 35 USC 102(b) by Begley et al.
3	Claim 3 is obvious under 35 USC 103(a) over Sullivan in view of Winslow or Junker et al.
3	Claim 3 is obvious under 35 USC 103(a) over Hölzl in view of Winslow, Junker et al. or Sullivan.
3	Claim 3 is obvious under 35 USC 103(a) over Sullivan in view of Sapia or Wilkerson per Claim 2 and in further view of Sullivan et al.

Claim	Proposed Statutory Rejections for the '269 Patent
3	Claim 3 is obvious under 35 USC 103(a) over Begley et al. in view of Sapia or Wilkerson per Claim 2 and in further view of Sullivan et al.
4	Claim 4 is anticipated under 35 USC 102(b) by Begley et al.
4	Claim 4 is anticipated under 35 USC 102(b) by Hölzl.
4	Claim 4 is obvious over Sullivan in view of any of Holt, Hölzl or Winslow.
5	Claim 5 is anticipated under 35 USC 102(b) by Begley et al.
5	Claim 5 is obvious under 35 USC 103(a) over Sullivan in view of Junker et al.
5	Claim 5 is obvious under 35 USC 103(a) over Hölzl in view of Junker et al.
6	Claim 6 is anticipated under 35 USC 102(b) by Begley et al.
6	Claim 6 is obvious under 35 USC 103(a) over Sullivan in view of Junker et al.
6	Claim 6 is obvious under 35 USC 103(a) over Hölzl in view of Junker et al.
7	Claim 7 is anticipated under 35 USC 102(b) by Begley et al.
7	Claim 7 is obvious under 35 USC 103(a) over Sullivan in view of Junker et al. and Hölzl.
7	Claim 7 is obvious under 35 USC 103(a) over Hölzl in view of Junker et al.
8	Claim 8 is anticipated under 35 USC 102(b) by Begley et al.
8	Claim 8 is obvious under 35 USC 103(a) over Sullivan in view of Junker et al. and Holt.
8	Claim 8 is obvious under 35 USC 103(a) over Hölzl in view of Junker et al.
9	Claim 9 is anticipated under 35 USC 102(b) by Sullivan.
9	Claim 9 is anticipated under 35 USC 102(b) by Begley et al.
9	Claim 9 is obvious under 35 USC 103(a) over Hölzl in view of Hedengren et al.
10	Claim 10 is obvious under 35 USC 103(a) over Sullivan in view of any of Stoor, Sullivan et al., Eberhard et al. or Winslow.
10	Claim 10 is obvious under 35 USC 103(a) over Begley et al. in view of any of Stoor, Sullivan et al., Eberhard or Winslow.
10	Claim 10 is obvious under 35 USC 103(a) over Hölzl in view of any of Stoor, Sullivan et al., Eberhard e al. or Winslow.

Claim	Proposed Statutory Rejections for the '269 Patent
11	Claim 11 is anticipated under 35 USC 102(b) by Begley et al.
11	Claim 11 is obvious under 35 USC 103(a) over Sullivan in view of Junker et al.
11	Claim 11 is obvious under 35 USC 103(a) over Hölzl in view of Winslow and Junker et al.
11	Claim 11 is obvious under 35 USC 103(a) over Hedengren et al. in view of Winslow and Junker et al.
11	Claim 11 is obvious under 35 USC 103(a) over Holt in view of Winslow and Junker et al.
11	Claim 11 is obvious under 35 USC 103(a) over Eberhard et al. in view of Winslow an Junker et al.
12	Claim 12 is anticipated under 35 USC 102(b) by Begley et al.
12	Claim 12 is obvious under 35 USC 103(a) over Sullivan in view of Junker et al., Hölzl or Winslow
12	Claim 12 is obvious under 35 USC 103(a) over Hölzl in view of Junker et al. and Winslow
13	Claim 13 is obvious under 35 USC 103(a) over Sullivan in view of Junker et al., Hölzl or Winslow.
13	Claim 13 is obvious under 35 USC 103(a) over Begley et al. in view of Junker et al., Hölzl or Winslow.
13	Claim 13 is obvious under 35 USC 103(a) over Hölzl in view of Junker et al. and Winslow.
14	Claim 14 is obvious under 35 USC 103(a) over Sullivan in view of Junker et al. or Junker et al. and Sapia.
14	Claim 14 is obvious under 35 USC 103(a) over Begley et al.
14	Claim 14 is obvious under 35 USC 103(a) over Hölzl in view of Junker et al.
14	Claim 14 is obvious under 35 USC 103(a) over Hedengren et al. in view of Junker et al.
14	Claim 14 is obvious under 35 USC 103(a) over Holt in view of Junker et al.
14	Claim 14 is obvious under 35 USC 103(a) over Eberhard et al. in view of Junker et al.
15	Claim 15 is obvious under 35 USC 103(a) over Sullivan.
15	Claim 15 is obvious under 35 USC 103(a) over Begley et al.
15	Claim 15 is obvious under 35 USC 103(a) over any of Hölzl, Holt, Eberhard et al. or Hedengren et al. in view of Junker et al., and Sullivan or Winslow or Begley et al.

Claim	Proposed Statutory Rejections for the '269 Patent
15	Claim 15 is obvious under 35 USC 103(a) over any of Hölzl, Holt, Eberhard et al. or Hedengren et al. in view of Junker et al.
16	Claim 16 is obvious under 35 USC 103(a) over Sullivan in view of Junker et al.
16	Claim 16 is obvious under 35 USC 103(a) over Begley et al.
16	Claim 16 is obvious under 35 USC 103(a) over any of Hölzl, Holt, Eberhard et al. or Hedengren et al. in view of Junker et al.
16	Claim 16 is obvious under 35 USC 103(a) over any of Hölzl, Holt, Eberhard et al. or Hedengren et al. in view of Junker et al. and Sullivan or Begley et al.
17	Claim 17 is obvious under 35 USC 103(a) over Sullivan.
17	Claim 17 is obvious under 35 USC 103(a) over Begley et al.
17	Claim 17 is obvious under 35 USC 103(a) over any of Hölzl, Holt, Eberhard et al. or Hedengren et al. in view of Junker et al.
17	Claim 17 is obvious under 35 USC 103(a) over any of Hölzl, Holt, Eberhard et al. or Hedengren et al. in view of Junker et al. and Sullivan or Begley et al.
18	Claim 18 is obvious under 35 USC 103(a) over Sullivan.
18	Claim 18 is obvious under 35 USC 103(a) over Begley et al.
18	Claim 18 is obvious under 35 USC 103(a) over any of Hölzl, Holt, Eberhard or Hedengren in view of Junker et al.

3. How the Challenged Claim(s) are to be Construed Under 37 C.F.R. §42.104(b)(3)

A claim subject to *inter partes* review receives the "broadest reasonable construction in light of the specification of the patent in which it appears." 42C.F.R. § 42.100(b). Petitioner submits, for the purposes of the IPR only, that the claim terms are presumed to take on their ordinary and customary meaning that the term would have to one of ordinary skill in the art in view of the Specification of the '269 Patent. The meaning of the following terms is based on their ordinary meaning in view of the full disclosure of the '269 Patent.

i. Claims 1, 11 and 14: "noise"

Noise is any unwanted signal.

ii. Claims 1, 11 and 14: "remote from the field site"

Remote from the field site is any place other than the location of the component from which field data is taken.

iii. Claims 1, 11 and 14: "combining"

Combining is the act of uniting into a single number or expression.

iv. Claims 4 and 13: "signal orientation"

To orient means to set or arrange in any determinate position. Thus signal orientation is an arrangement of the signals relative to a determinate position.

v. Claim 10: "mathematical model"

A mathematical model is an artificial representation of a specimen created at least in part with a formula, interpolation, logic or prior experience.

vi. Claim 11: "characteristic"

A characteristic is any attribute, feature or quality.

4. How the Construed Claim(s) are Unpatentable Under 37 C.F.R. §42.104(b)(4)

An explanation of how construed claims 1-18 of the '269 Patent are unpatentable under the statutory grounds identified above, including the identification of where each element of the claim is found in the prior art patents or printed publications, is provided in Section VI, below.

5. Supporting Evidence Under 37 C.F.R. §42.104(b)(5)

The exhibit numbers of the supporting evidence relied upon to support the challenge and the relevance of the evidence to the challenge raised, including identifying specific portions of the evidence that support the challenge are provided in Section VI, below.

IV. SUMMARY OF THE '269 PATENT

A. Description of the Alleged Invention of the '269 Patent

The ‘269 patent (Ex. 1001) is directed to the combination of two pieces of non-destructive testing data to form a simulated combined data train (Claim 1). One piece of data is generated from a component undergoing nondestructive examination at a field site and includes noise (Independent Claims 1, 11 and 14). The second piece of data is generated from a specimen that simulates the component undergoing non-destructive examination. The combined data train is to “reflect the non-destructive examination response to the selected flaw in a background representative of data collected at the field site” (Claims 1, 11 and 14). The location at which the specimen data is collected “is not pertinent to the broad aspects of this invention” (c. 2, ll. 61-63). The specimen that simulates the component under test can be a mathematical model (Claim 10). Limitations in Claims 2-18 beyond those in Claim 1 are directed to details of calibration and collection of the data.

B. Summary of the Prosecution History of the ‘269 Patent

The ‘269 Patent was filed April 12, 2002, and issued November 23, 2004, with 18 claims, of which claims 1, 11, and 14 are independent. The ‘269 Patent as filed included claims 1-24, of which Claim 1 and 2 were independent. In a first office action dated October 6, 2003, Claims 1-6, 10-14, 18 and 21-24 were rejected. Claims 7-9, 15-17, 19 and 20 were objected to as being based on rejected claims but allowable if rewritten in independent form to include the limitations of the independent claim and any intervening limitations. Claim 1 was rejected as anticipated under 35 USC § 102(b) over US Patent no. 4,763,274 (“Junker et al”) (Ex. 1012). The applicants subsequently cancelled Claim 1. Claims 2-24 were rejected as obvious under 35 USC § 103 over Junker et al. in view of US Patent no. 5,623,204 (“Wilkerson”) (Ex. 1013). In response, the applicants amended Claim 2 (now Claim 1) to include the limitation of the laboratory site being “remote from the field site” from original Claim 3 and that the “data

collected at the field site includes noise" and argued for allowance of amended Claim 2 (now Claim 1) over the references.

The applicants argued for allowance of amended Claim 2 in that "Junker does not teach generating two distinct sets of data at two remote locations, one at the component being examined, and the second at a remote laboratory site from the specimen" (Amendment dated Nov. 19, 2003, p. 7). This argument was a significant departure from the applicant's statement in the specification that the location of where the specimen data was collected is "not pertinent to the broad aspects of the invention" (c. 2, ll. 60-66).

The November 19, 2003 Amendment included two new independent Claims 25 and 26, which represented previously dependent Claims 7 and 15, which had been indicated as allowable, and which were rewritten into independent form. As such, new Claim 25 (now Claim 11) included the limitations of original Claims 2, 5 and 7 and new Claim 26 (now Claim 14) included the limitations of original Claims 2, 5 and 15. The amendment to Claim 2 was the only amendment required to allow the independent Claims, as new Claims 25 and 26 were based on dependent claims that the examiner had indicated as allowable.

A Notice of Allowance dated January 2, 2004, was issued in response to the November 19, 2003. The Notice allowed Claims 2, 5-6, 8-14, 16, 20 and 24-26. The Examiner's reasons for allowance repeated the text of independent Claims 2, 25 and 26 and stated that the prior art of record did not teach the methods as stated in each of those claims. Original dependent Claims 5, 6, 10-14, 18 and 24 correspond to the claims now numbered 2-10 in the '269 patent. Claims 25 and 26 correspond to independent Claims 11 and 14 of the '269 Patent. Claim 2 corresponds to Claim 1 of the '269 Patent. Original dependent Claims 8 and 9 correspond to Claims 12 and 13

in the ‘269 Patent. Original dependent Claims 16, 17, 19 and 20 correspond to the claims now numbered 15-18, respectively, in the ‘269 Patent.

V. THERE IS A REASONABLE LIKELIHOOD THAT AT LEAST ONE CLAIM OF THE ‘ PATENT IS UNPATENTABLE UNDER 37 C.F.R. §42.104(b)(4)

A. Identification of the References as Prior Art

Begley, J.A., et al. Depth Based Structural Analysis Methods for SG Circumferential Indications. (“Begley et al.”) (Ex. 1018). Report prepared for Electric Power Research Institute (“EPRI”), dated December 1997. EPRI is an industry group. Begley et al. was available to all members and bore no confidentiality restrictions. Begley et al. was subsequently cited in Wang, X. & Reinhardt, W., On the Assessment of Through-wall Circumferential Cracks in Steam Generator Tubes with Tube Supports. *Journal of Pressure Vessel Technology*, Feb. 2003, Vol. 125, p. 85 (presented July 22-26, 2001, received Nov. 8, 2001) (Ex. 1015, p. 90, ref. 4). Begley et al. was also cited in an Entergy report “Operational Assessment of ANO-2 Steam Generator Tubing for the Remainder of Cycle 14, Report dated February 3, 2000 (Ex. 1016, p. 29, ref. 4). The Wang et al. article and the Entergy report demonstrate the availability of Begley et al. to those in the steam generator and non-destructive test industry. The test for whether a document is a publication is whether it was available to “the interested public.” See *Cooper Cameron Corp., v. Kvaerner Oilfield Products, Inc.,* 291 F.3d 1317 (Fed. Cir. 2002). As such, Begley is 35 USC §102(b) prior art.

Sullivan, S.P. Guidelines for Qualifying Eddy Current Technology for CANDU Steam Generator Tube Inspection. March 1999. Published by Atomic Energy of Canada, Ltd. **(“Sullivan”)** (Ex. 1002). The Sullivan report was given a designation indicating that it was available upon request. (Sullivan Dec.) (Ex. 1017). Based on the date of publication, Sullivan is 35 USC §102(b) prior art.

Sullivan et al. Applying Computer Modeling to Eddy Current Signal Analysis for Steam Generator and Heat Exchanger Tube Inspections. ("Sullivan et al.") (Ex. 1003). *AIP Conference Proceedings 509,* p. 401 (2000). Based on the date of publication, Sullivan et al. is 35 USC §102(b) prior art.

Cecco, V.S. and Sullivan, S.P. Presentation slides dated Oct. 19-23, 1998. ISG_TIP2 Task Coordinating Group Meeting at Argonne National Laboratory. **("Cecco et al.")** (Ex. 1004). Cecco was distributed to attendees at a conference at the United States Department of Energy's Argonne National Laboratory. Attendees would have included industry and regulatory representatives from the nuclear power industry in the United States and abroad. (Sullivan Dec.) (Ex. 1017). Based on the date of publication, Cecco et al. is 35 USC § 102(b) prior art.

U.S. Patent no. 4,194,149. Method for Generating the Eddy Current Signature of a Flaw in a Tube Proximate a Contiguous Member Which Obscures the Flaw Signal. **("Holt")** (Ex. 1005). Filed December 15, 1977. Issued March 18, 1980. Holt et al. is 35 USC § 102(b) prior art.

U.S. Patent no. 4,867,168. Apparatus for Simulating Inspection Equipment. ("**Stoor")** (Ex. 1006). Filed August 8, 1988. Issued, September 19, 1989. Stoor is 35 USC § 102(b) prior art.

U.S. Patent no. 4,920,491. Enhancement of Image Quality by Utilization of A Priori Information. ("**Eberhard et al**.") (Ex. 1007). Filed May 16, 1988. Issued April 24, 1990. Eberhard et al. is 35 USC § 102(b) prior art.

U.S. Patent no. 4,942,545. Calibration of Eddy Current Profilometry. ("**Sapia**") (Ex. 1008). Filed June 6, 1988. Issued July 17, 1990. Sapia is 35 USC §102(b) prior art.

U.S. Patent no. 5,371,462. Eddy Current Inspection Method Employing a Probe Array with Test and Reference Data Acquisition and Data Processing. ("**Hedengren et al**.") (Ex. 1009). Filed March 19, 1993. Issued Dec. 6, 1994. Hedengren et al. is 35 USC § 102(b) prior art.

U.S. Patent no. 5,434,571. Radar Target Simulator. ("**Erle**") (Ex. 1010). Foreign priority date Jan. 20, 1993. Issued July 18, 1995. Erle is 35 USC § 102(b) prior art.

U.S. Patent no. 6,566,871. Process and Device for Testing A Workpiece by Means of Eddy Currents. **("Hölzl")** (Ex. 1011). Filed Sept. 17, 2001. Issued May 20, 2003. Foreign application priority date Sept. 15, 2000 based on German patent application 100 45 715. Based on the U.S. filing date, Hölzl is 35 USC §102(e) prior art.

EP 0 990 897 A2. Method and System for Determining Pipeline Defects. **("Winslow")** (Ex. 1014). European Patent Application. Filed Sept. 30, 1999. Published April 5, 2000. Winslow is 35 USC §102(b) prior art. Winslow claims priority to U.S. Patent No. 6,359,434 filed Sept. 30, 1998.

None of the foregoing references were of record during prosecution of the '269 Patent, and none were relied upon in any rejection of the claims.

U.S. Patent No. 4,763,274. Machine Implemented Analysis of Eddy Current Data. **("Junker et al.")** (Ex. 1012). Issued on August 9, 1988. Therefore, Junker et al. is prior art to the '269 Patent under 35 U.S.C. §102(b).

U.S. Patent No. 5,623,204. Eddy Current Probe. **("Wilkerson") (Ex. 1013).** Wilkerson issued on April 22, 1997, therefore Wilkerson is prior art under 35 USC §102(b).

Junker et al. and Wilkerson were cited during prosecution of the '269 Patent and were relied upon as a basis for a rejection. Junker et al. was the primary reference during

prosecution. It is applied in this petition to demonstrate 35 USC §103 invalidity of certain claims in combination with primary references not previously cited in prosecution.

B. Summary of Invalidity Arguments

The alleged invention of non-destructive test data signal combination to produce a simulated flaw combined with field data is analogous to cutting and pasting text or image portions from a first document into a second one. This is called "signal injection" and was well known in the field of non-destructive testing of steam generators from as early as 1997. A published report prepared that year for the Electric Power Research Institute (EPRI) and co-authored by the alleged inventors (Begley et al., Ex. 1018) describes combining lab-prepared specimen data and field data and fully anticipates at least Claims 1-9. The alleged invention was also described in a 1999 report by S.P. Sullivan, published by Atomic Energy of Canada, Ltd. This document was available to a wide audience of those in the relevant industry with no restrictions on distribution (Sullivan Dec., Ex. 1017). The alleged invention, at least as to Claims 1, 2 and 4, was also fully described in a U.S. patent, Hölzl (Ex. 1011), filed in the U.S. prior to the '269 patent.

Combining non-destructive test signals, including lab-prepared reference signals with field signals was known even earlier than 1997. Hedengren et al. (Ex. 1009) described this process as to eddy current testing in 1994, while Eberhard et al. (Ex. 1007) disclosed it in 1988 in the analogous field of X-ray computer tomography non-destructive testing.

In addition to the direct anticipation of the alleged invention by the documents referred to above, the concept of signal combination to form a simulated signal is obvious over a host of similar uses in other fields. In one example, this process was used to simulate radar targets as early as 1995 (Earle) (Ex. 1010).

As described in detail below, the remaining claims contain minor limitations added to the broad concept of combining two signals that involve either calibration of one or both signals (Claims 2, 4, 11-14 and 17)—an obvious necessity whenever combining signals from multiple sources—or the source of the data (Claims 3, 5-10), or immaterial issues of how or where the data is stored (Claims 15, 16 and 18). None of these minor distinctions raises the anticipated and obvious broad concept of signal cut and paste to the level of patentability.

VI. DETAILED EXPLANATION UNDER 37 C.F.R. §42.104(b)

Several of the claims are demonstrated below to be obvious under 35 U.S.C. §103(a). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981 (CCPA 1974). "All [relevant] words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970). Manual of Patent Examine Procedure (M.P.E.P.) 2143.03. It is important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *KSR Int'l Co. v. Teleflex, Inc.*, 12 S.Ct. 1727, 1740 (2007).

The M.P.E.P. describes the obviousness framework to establish *prima facie* obviousness. See Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR Int'l Co. v. Teleflex Inc.*, Fed. Reg., Vol. 72, No. 195, October 10, 2007 ("Guidelines"); and Examination Guidelines Update: Developments in the Obviousness Inquiry After *KSR v.Teleflex*. Fed. Reg., Vol. 75, No. 169, Sept. 1, 2010 ("Guidelines Update").

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981. "All [relevant] words in a claim must be considered in judging the patentability of that claim against the prior art." *In re*

Wilson, 424 F.2d 1382, 1385 (CCPA 1970). M.P.E.P. 2143.03. It is important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *KSR Int'l.* 12 S.Ct. at, 1740. Moreover, the Guidelines state that a claimed invention is likely obvious if it is a combination of known prior art elements that would reasonably have been expected to maintain their respective properties or functions after they have been combined. See *Sundance, Inc. v. DeMonte Fabricating Ltd*., 550 F.3d 1335 (Fed. Cir. 2009).

Explanations as to the obviousness rationale for each reason for invalidity are given in the explanations of invalidity and claim charts below, but as a general matter, it is noted that all of the references applied herein are directed to non-destructive testing and thus would have been pertinent to the problem the inventor was trying to resolve and well understood by those of ordinary skill in the art. "The scope of analogous art is to be construed broadly and includes references that are reasonably pertinent to the problem the inventor was trying to solve." *Ecolab, Inc. v. FMC Corp.* 569 F.3d, 1335 (Fed. Cir. 2009).

In several instances the dependent claims include such obvious elements as storing a calibration value for which no additional reference is required. In these instances, common sense in light of well-known technology is a valid rationale for an obviousness rejection. See M.P.E.P. §2143 citing *Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318 (Fed. Cir. 2008) (obvious to use web for transactions).

A. Claims 1-10 wherein Claims and 9 are Anticipated by Sullivan (Ex. 1002).

Sullivan discloses each element of Claim 1 of the '269 patent. The specific references are listed with the claim elements in the claim chart below. Sullivan refers to the process as "signal injection" p. 9. The "field site" data of the claim are taken from an "in-service tube" in

Sullivan. Flawed tubes are created in the lab (p. 9), scanned and the flaw signal superimposed on the in-service tube data (p. 9) to create a combined data signal.

Claim 1	Anticipated by Sullivan (Ex. 1002)
A method of synthesizing nondestructive examination data to be used for training data analysts and/or testing inspection techniques comprising the steps of:	"methods that can be used as performance demonstrations for qualifying eddy current inspection techniques" p .7 "The 'signal injections' method can superimpose flaw signals upon signals in data files from eddy current scans of in-service tubes" p. 9.
generating data collected at a field site of a component from non-destructive examination of the component, which data collected at the field site includes noise;	"[S]ections of a data file [are]generated from a scan of an in-service tube" (p. 9).
creating a specimen that simulates the component undergoing non-destructive examination with a selected flaw;	"These laboratory measurements may consist of scans of the flawed tubes" (p. 9).
generating nondestructive examination data at a laboratory site, remote from the field site, from the specimen of the component undergoing non-destructive examination;	"Laboratory methods have been developed that can induce real fatigue cracks and SCC [stress corrosion cracks] in SG [steam generator] tubes" (p 4).
and combining at least some of the nondestructive examination data collected at the field site with at least some of the nondestructive examination data collected at the laboratory site to establish a combined data train that reflects the nondestructive examination response to the selected flaw in a background representative of data collected at the field site.	"The 'signal injection ' method can **superimpose flaw signals upon signals in data files from eddy current scans of in-service tubes**. This is accomplished by selecting a certain portion of a data file with a flaw signal in it, subtracting the baseline value from all the data points)both the horizontal and vertical components), and adding the result to appropriate sections of a data file generated from a scan of an in-service tube. **This method can be used to simulate the distortion of flaw signals by the background noise encountered in scans of the in-service SG tubes**" (p. 9).

Claim 2 is obvious under 35 USC 103(a) over Sullivan in view of any of Sapia (Ex. 1008), Winslow (Ex. 1014) or Junker et al. (Ex. 1012). Claim 2 is directed to calibrating lab and field data to the same signal strengths, i.e. amplitude. This is a common sense step for any measurement method. Sullivan states that "both real and simulated (lab) signals are normalized

to that from a common calibration flaw. Normalization is a method of equalizing amplitudes. Each of Sapia, Winslow and Junker et al. disclose calibrating eddy current data as shown in the accompanying claim chart. At least one reason to calibrate at the lab and the field site is that Claim 1 contemplates that separate probes can be used, as stated in dependent Claim 5. Claim 2 is obvious over Sullivan in view of Sapia, Winslow or Junker et al. because there was an "apparent reason to combine in conjunction with the technical ability to optimize." See Guidelines Update citing *Ecolab, Inc*. "A claimed invention is likely obvious if it is a combination of known prior art elements that would reasonably have been expected to maintain their respective properties or functions after they have been combined." M.P.E.P. § 2143 citing *Sundance v. DaMonte.* ***To save space, hereinafter the preceding obviousness rationales are referenced, where applicable, without citation.***

Claim 2	**Obvious over Sullivan in view of Sapia (Ex. 1008), Junker et al. (Ex. 1012) or Winslow (Ex. 1014)**
The method of claim 1 including the steps of separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw.	Sapia: "equipment must be properly calibrated in order for the acquired data to provide accurate results regarding the tube profile" (c. 1, ll. 29-33). Winslow: p. 15, [0099] discloses calibrating ECT data. Junker et al.: discloses calibrating an ECT system to a <u>calibration standard having a first flaw</u> (c. 6, ll. 1-15). "Calibration information is taken each time the probe is changed."

<u>Claim 2</u> is also obvious over Sullivan (Ex. 1002) in view of Hölzl (Ex. 1011), which discloses that fault signals are displayed as a function of "amplitude and phase angle" (c. 1, ll. 28-32). One skilled in the art would be motivated to calibrate the data collected at each of the two sites based on signal strength to achieve a consistent combined data string particularly in

view of Sullivan's teaching normalization. Thus Claim 2 is obvious where there was a "reason to combine plus technical ability to optimize."

Claim 3 is obvious over Sullivan (Ex. 1002) in view of Winslow or Junker et al. Claim 3 depends from Claim 2 and merely adds that the "flaw is provided by a calibration standard." Use of a calibration standard is an obvious step in any measurement process. Calibration test flaws are disclosed in Winslow (p. 15, [0100]) and Junker et al. (c.6, ll. 5-6). One skilled in the art would use a standard flaw for calibration to obtain consistent data, especially if two probes were used. Thus there was an "apparent reason to combine in conjunction with the technical ability to optimize."

Claim 3 is also obvious over Sullivan in view of Sapia (Ex. 1008) or Hölzl (Ex. 1011) (per Claim 2) and in further view of Sullivan et al. (Ex. 1003). While neither Sullivan, Sapia nor Hölzl specifically discloses a calibration standard flaw, Sullivan et al., in the same field of art and coauthored by Sullivan of the primary reference, discloses "calibration tubes [that] have manufactured or simulated flaws in them." (p. 409). One skilled in the art would combine these references and use a standard flaw for calibration to obtain consistent data. Thus there was an "apparent reason to combine in conjunction with the technical ability to optimize." Moreover invention is likely obvious if it is a combination of known prior art elements that would reasonably have been expected to maintain their respective properties or functions after they have been combined.

Claim 4 is obvious over Sullivan (Ex. 1002) in view of any of Holt (Ex. 1005) or Winslow (Ex. 1014). Claim 4 is directed to separately calibrating the data collected at each site based on "signal orientation." Signal orientation is phase angle as stated in Claim 13 of the '269 Patent. As shown in the claim chart below, Winslow and Holt, both of which are directed to

eddy current non-destructive testing, disclose calibration or normalization as to phase angle. It would have been obvious to combine Sullivan with Winslow or Holt to produce a consistent combined data stream. Thus, there was an "apparent reason to combine in conjunction with the technical ability to optimize." Moreover an invention is likely obvious if it is a combination of known prior art elements that would reasonably have been expected to maintain their respective properties or functions after they have been combined

Claim 4	Obvious over Sullivan in View of Holt (Ex. 1005) or Winslow (Ex. 1014)
The method of claim 1 including the steps of separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal orientation.	Holt: "The tapes [of eddy current signals] are played back in synchronism and in phase" (c. 5, ll. 18-19). Winslow: discloses normalization as to phase, i.e. signal orientation (p.10, [0060]).

Claim 4 is also obvious over Sullivan (Ex. 1002) in view of either Sullivan et al. (Ex. 1003) or Hölzl (Ex.1011). Both Sullivan et al. and Hölzl disclose that phase angle is relative to material thickness and flaw size. See Sullivan et al. at p. 406 and Hölzl at c. 1, ll. 33-35. Based on the teaching of Sullivan et al. or Hölzl, one skilled in the art would want to ensure a consistent combined data stream for training analysts to recognize flaws by calibrating the data to the same phase angle. Thus, there was an "apparent reason to combine in conjunction with the technical ability to optimize." The combination is likely obvious if it is a combination of known prior art elements that would reasonably have been expected to maintain their respective properties or functions after they have been combined.

Claim 5 is obvious over Sullivan (Ex. 1002) in view of Junker et al. (Ex. 1012).

Claim 5 is directed to a common sense step of using a different detector at the lab and field site. Common sense may support a finding of obviousness. M.P.E.P. §2143 citing *Perfect Web*

Technologies, Inc. v. InfoUSA, Inc., 587 F.3d 1324, 1328-29 (Fed. Cir. 2009). There are many reasons to use two detectors including convenience, time-saving and damage to the detector. The NDT field testing may occur in a radioactive environment and removal of the probe to the lab may be hazardous. See Junker et al. c. 1, l. 25. The detectors can be separately calibrated (Junker et al. c. 6, ll. 1-15) so it is technically feasible to use two detectors. Thus there was an "apparent reason to combine in conjunction with the technical ability to optimize."

Claim 6 is obvious over Sullivan (Ex. 1002) in view of Junker et al. (Ex. 1012). Claim 6 depends from Claims 1 and 5 and is directed to the common sense step of using the same type of detector in the field and the lab. Common sense may support a finding of obviousness. See *Perfect Web Tech.* A stated purpose of Claim 1 is to train technicians to recognize flaws by simulating a detector data stream. Signals from the same type of detector are necessary if the goal is to simulate the response of a single detector to a flaw signal in the context of background noise, since different detector types would not produce consistent data.

Claim 7 is obvious over Sullivan (Ex. 1002) in view of Junker et al. (Ex. 1012) and Hölzl (Ex. 1011). Claim 7 depends from Claims 1, 5, and 6 and is directed to the common sense step of operating the detectors at the same operating frequencies. Common sense may support a finding of obviousness. See *Perfect Web Tech.* Operating frequency affects detector response to flaws, so using the same frequencies is a common sense step. Moreover, in the same field, Hölzl discloses using the same detection frequencies for a reference specimen and a test specimen (c. 3, ll. 10-18). Thus there was an "apparent reason to combine in conjunction with the technical ability to optimize." The combination is likely obvious if it is a combination of known prior art elements that would reasonably have been expected to maintain their respective properties or functions after they have been combined

Claim 8 is obvious over Sullivan (Ex. 1002) in view of Junker et al. (Ex. 1012) and Holt (Ex. 1005). Claim 8 depends from Claims 1, 5, and 6 and is directed to the common sense step of operating the detectors at the same data collection rates. Use of the same data collection rates would be an obvious step for producing a combined data stream. Common sense may support a finding of obviousness. See *Perfect Web Tech.* Moreover, in the same field, Holt discloses the need to have reference and service data collection at the same data collection rates "these tapes [reference and service] are then played back in synchronism and phase" (c. 5, ll. 17-18). Based on the purpose of creating a combined data stream for analyst training, there was "apparent reason to combine [Sullivan, Junker et al. and Holt] in conjunction with the technical ability to optimize."

Claim 9 is anticipated by Sullivan (Ex. 1002). Claim 9 states "a segment of data collected at one of either the field site or the laboratory site is combined with data collected at the other of either the field site or the laboratory site." This is disclosed by Sullivan at p. 9, section 4.5: "portions of a data file with a flaw in it [are combined with] appropriate sections of a data file generated from a scan of an in-service tube."

Claim 10 is obvious over Sullivan (Ex. 1002) in view of any one of Stoor (Ex. 1006), Sullivan et al. (Ex. 1012), Eberhard et al. (Ex. 1007) or Winslow (Ex. 1014). Claim 10 is directed to using a mathematical model to create the specimen data. Stoor, Sullivan et al., Eberhard et al. and Winslow, all in the same field as the '269 patent, disclose use of a mathematical or computer simulated flaw. Relevant citations for each reference are in the claim chart below. One would be motivated to use a mathematical model to achieve an "ideal" flaw signature or where an actual flawed component was not available. Thus there was "apparent reason to combine [Sullivan, with either Stoor, Sullivan et al., Eberhard et al. or Winslow] in

conjunction with the technical ability to optimize." The combination is likely obvious if it is a combination of known prior art elements that would reasonably have been expected to maintain their respective properties or functions after they have been combined.

Claim 10	Obvious over Sullivan in View of any one of Stoor (Ex. 1006), Sullivan et al. (Ex. 1003), Eberhard et al. (Ex. 1007) or Winslow (Ex. 1014)
The method of claim 1 wherein the specimen is a mathematical model and the data generated from the specimen is generated by the mathematical model.	**Stoor:** NDT simulation data can come from theoretical models (c. 5, ll. 5-17). **Sullivan et al.:** "Computer modeling is a useful tool in providing realistic flaw signals with which eddy current probes can be calibrated" (p. 408). **Eberhard et al.:** "calculating model projection data . . . combining the partial image reconstructed from measured data and model difference image to yield a final image" (c. 2, ll. 39-54). **Winslow:** "A theoretical calibration value and a theoretical nominal value may be calculated using the standard eddy current equations." (p. 15, [0104]).

B. Claims 1-10 wherein Claims 1-9 are Anticipated by Begley et al. (Ex. 1018).

<u>Claim 1</u> is anticipated under 35 USC 102(b) by Begley et al (Ex. 1018). Begley et al. is an industry report on methods for steam generator tube integrity assessment and includes NDT with eddy current detectors (p. 1-1). A database of flawed and non-flawed test data was compiled from a number of field sites. (Table 5-10, p. 5-58). The field data included noise. (p. 5-31). Lab samples with flaws were also prepared and included in the database (p. 5-25). A process of signal extraction and reinsertion was used with Zetec software to produce combined data streams having data from the lab with flaws and from the field that included noise. The extraction of flaw data in combination with field data signals is fully described in Section 5.7.6.2., page 5-29. The following claim chart associates claim terms with relevant disclosure in Begley et al.

Claim 1	Anticipated by Begley et al. (Ex. 1018)
A method of synthesizing nondestructive	The disclosed process is for "analyst

examination data to be used for training data analysts and/or testing inspection techniques comprising the steps of:	training" (p.5-25).
generating data collected at a field site of a component from non-destructive examination of the component, which data collected at the field site includes noise;	"sectors of flaw signals, 30˚ in length, were cut from the flaw signals of pulled tubes [i.e. field site data] and were resynthesized as flaw and NDD [no discernible deterioration, i.e. just noise] signals to provide a large database of flaw signals" (p. 2-10). The field data included noise (p. 5-31, third paragraph).
creating a specimen that simulates the component undergoing non-destructive examination with a selected flaw;	"it was necessary to produce laboratory samples which were representative of operational steam generator conditions" (p. 4-1). "corrosion specimens were prepared with circumferential cracks at expansion transitions" (p. 2-16). "laboratory specimens were included in the database" (p. 5-25).
generating nondestructive examination data at a laboratory site, remote from the field site, from the specimen of the component undergoing non-destructive examination;	Data from laboratory created samples were included in combined training signals (p. 5-25). The sample database from which combined datasets were made shows both field and laboratory data (Table 5-9, p. 5-57).
and combining at least some of the nondestructive examination data collected at the field site with at least some of the nondestructive examination data collected at the laboratory site to establish a combined data train that reflects the nondestructive examination response to the selected flaw in a background representative of data collected at the field site.	"sectors of flaw signals [obtained from the field sites], were cut from the flaw signals of pulled tubes and were resynthesized as flaw and NDD signals to provide a large database of flaw signals" (p. 2-10). The editing and insertion of flaw data into field data, into a segmented data set is described on page 5-29, section 5.7.6.2 "Test Data Preparation."

Claim 2 is anticipated by Begley et al. (Ex. 1018). Claim 2 is directed to "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." Begley et al. discloses separate calibration of field and laboratory data to the same calibration standard. See Table 5-10, p.5-58.

Claim 3 is anticipated by Begley et al. (Ex. 1018). Claim 3 is directed to the use of a calibration standard flaw. Begley discloses the use of a "drilled hole ASME standard" flaw (p. 5-2). This ASME standard flaw was used to calibrate both field and laboratory data (Table 5-10, p. 5-58). See also p. 5-2 "Calibration Standards."

Claim 4 is anticipated by Begley et al. (Ex. 1018). Claim 4 is directed to separately calibrating the field and lab data to have the same relative signal orientation (phase angle, see '269 Patent Claim 13). Begley et al. discloses calibrating the data sets as to phase angle (p. 5.27): "Phase angle versus depth calibration curves were established."

Claim 5 is anticipated by Begley et al. (Ex. 1018). Claim 5 is directed to wherein "data collected at the field site is collected from the step of operating a first eddy current detector and the data collected at the laboratory site is collected from the step of operating a second eddy current detector." Begley et al. discloses that different detectors were used at the field and lab sites (See Table 5-10, p. 5-58, 3-coil probe used at site CA-2 versus pancake and plus-point used in lab).

Claim 6 is anticipated by Begley et al. (Ex. 1018). Claim 6 depends from Claim 5 wherein the two detectors are the same type. Table 5-10 (p. 5-58) show the same type of detector (pancake coil) used at the field site (FM-2) and the lab. These were not the same detector (per Claim 5) because the FM-2 pancake was 0.125" and the lab pancake was "0.115/0.080SHF".

Claim 7 is anticipated by Begley et al. (Ex. 1018). Claim 7 is directed to the method of Claim 6 wherein the first and second detectors are operated at substantially the same inspection frequencies. Table 5-10 (p. 5-58) shows that the FM-2 site and lab sample detectors were each operated at 100, 200 and 400 KHz.

Claim 8 is anticipated by Begley et al. (Ex. 1018). Claim 8 is directed to the method of Claim 6 wherein the first and second detectors are operated at substantially the same data collection rates. Begley et al. discloses the need for similar data collection rates in that a tube sampled at a different rate than the others could not be used. "One of the tubes in the data base . . . was subsequently eliminated because it was determined that sampling rate for this tube was insufficient to support the sizing methods" (p. 5-25).

Claim 9 is anticipated by Begley et al. (Ex. 1018). Claim 9 is directed to wherein only a segment of data collected at one of either the field site or the laboratory site is combined with data collected at the other of either the field site or the laboratory site. Begley et al. discloses the use of a segment of data: "ASCII files, representative of the EDDYNET data for target tubes from the pulled tube population, were generated to permit off-line production of short 30 degree tube data segments ranging from NDD [i.e. unflawed] to 100% depth. . . . Samples of NDD sectors from pulled tubes were included along with flaw segments" (p. 5-22-23).

Claim 10 is obvious over Begley et al. (Ex. 1018) in view of any one of Stoor (Ex. 1006), Sullivan et al. (Ex. 1003), Eberhard et al. (Ex. 1007) or Winslow (Ex. 1014). Claim 10 is directed to using a mathematical model to create the specimen data. Stoor, Sullivan et al., Eberhard et al. and Winslow, all in the same field as the '269 patent, disclose use of a mathematical or computer simulated flaw. Relevant citations for each reference are in the claim chart below. One would be motivated to use a mathematical model to achieve an "ideal" flaw signature or where an actual flawed component was not available. Thus there was "apparent reason to combine [Sullivan, with either Stoor, Sullivan et al., Eberhard et al. or Winslow] in conjunction with the technical ability to optimize."

Claim 10	Obvious over Begley et al. (Ex. 1018) in view of any one Stoor (Ex. 1006), Sullivan et al.(Ex. 1003), Eberhard et al. (Ex. 1007) or Winslow (Ex. 1014)
The method of claim 1 wherein the specimen is a mathematical model and the data generated from the specimen is generated by the mathematical model.	**Stoor:** NDT simulation data can come from theoretical models (c. 5, ll. 5-17). **Sullivan et al.:** "Computer modeling is a useful tool in providing realistic flaw signals with which eddy current probes can be calibrated" (p. 408). **Eberhard et al.:** "calculating model projection data . . . combining the partial image reconstructed from measured data and model difference image to yield a final image" (c. 2, ll. 39-54). **Winslow:** "A theoretical calibration value and a theoretical nominal value may be calculated using the standard eddy current equations." (p. 15, [0104]).

C. Claims 1-10, wherein Claims 1, 2 and 4 are Anticipated by Hölzl (Ex. 1011).

Claim 1 is anticipated by Hölzl (Ex. 1011). Hölzl is directed to eddy current testing wherein a reference "pattern signal" from a "reference test specimen with a defined fault" (c. 3, ll. 11-12) is cross correlated (combined) with a measurement signal from the field (c. 3, ll. 43-46). The relevant disclosures of Hölzl are set forth in the claim chart below.

Claim 1	Anticipated by Hölzl (Ex. 1011)
A method of synthesizing nondestructive examination data to be used for training data analysts and/or testing inspection techniques comprising the steps of:	Hölzl discloses synthesizing a pattern signal with a flaw (Claim 4) and cross correlating (i.e. synthesizing) the signal with a measurement signal (Claim 1) (i.e. field data).
generating data collected at a field site of a component from non-destructive examination of the component, which data collected at the field site includes noise;	A "noisy measurement signal" is obtained (c. 3, ll. 35-46).
creating a specimen that simulates the component undergoing non-destructive examination with a selected flaw;	A "reference measurement on a test piece with a defined fault" is used in the process (c. 3, ll. 9-15).
generating nondestructive examination data at a laboratory site, remote from the field site, from the specimen of the component undergoing non-destructive examination;	A "pattern signal" is obtained from a reference test specimen" (c. 3, ll. 9-15).
and combining at least some of the nondestructive examination data collected at the field site with at least some of the nondestructive examination data	The pattern signal is cross correlated with the measurement signal (Hölzl, Claim 1) to produce a combined signal.

collected at the laboratory site to establish a combined data train that reflects the nondestructive examination response to the selected flaw in a background representative of data collected at the field site.	

Claim 2 is anticipated by Hölzl (Ex. 1011). Claim 2 is directed to calibrating the lab and field data to the same signal strengths, i.e. amplitude. This is a common sense step for any measurement method. Hölzl discloses that fault signals are displayed as a function of amplitude and phase (c. 1, ll. 28-32). It is inherent in Hölzl that the two signals would have to be aligned as to signal strength to produce a consistent combined data stream.

Claim 3 is obvious over Hölzl (Ex. 1011) in view of Winslow (Ex. 1014), Junker et al. (Ex. 1012) or Sullivan et al (Ex. 1003). Claim 3 depends from Claim 2 and merely adds that the "flaw is provided by a calibration standard." Use of a calibration standard is an obvious step in any measurement process. Calibration test flaws are disclosed in Winslow (p. 15, [0100]), Junker et al. (c.6, ll. 5-6) and Sullivan et al. (p. 409). One skilled in the art would use a standard flaw for calibration to obtain consistent data, especially if two probes were used. Thus there was an "apparent reason to combine in conjunction with the technical ability to optimize."

Claim 4 is anticipated by Hölzl (Ex. 1011). Claim 4 is directed to separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal orientation. Hölzl discloses that thickness of the tested material affects phase shift (i.e. signal orientation) (c. 1, ll. 33-35). It is inherent in Hölzl that the two signals would have to be aligned as to signal orientation to produce a consistent combined data stream that consistently reflects material thickness and therefore any damage.

Claim 5 is obvious over Hölzl (Ex. 1011) in view of Junker et al. (Ex. 1012). Claim 5 is directed to a common sense step of using a different detector at the lab and field site. Common sense may support a finding of obviousness. See *Perfect Web Tech.* There are many reasons to do this including convenience, time-saving and damage to the detector. The NDT field testing may occur in a radioactive environment and removal of the probe to the lab may be hazardous. See Junker et al. (c. 1, l. 25). The detectors can be separately calibrated (Junker et al. c. 6, ll. 1-15) so it is technically feasible to use two detectors. Thus there was an "apparent reason to combine in conjunction with the technical ability to optimize."

Claim 6 is obvious over Hölzl (Ex. 1011) in view of Junker et al (Ex. 1012). Claim 6 depends from Claims 1 and 5 and is directed to the common sense step of using the same type of detector in the field and the lab. Common sense may support a finding of obviousness. See *Perfect Web Tech.* A stated purpose of Claim 1 is to train technicians to recognize flaws by simulating a detector data stream. Signals from the same type of detector are necessary if the goal is to simulate the response of a single detector to a flaw signal in the context of background noise, since different detector types would not produce consistent data.

Claim 7 is obvious over Hölzl (Ex. 1011) in view of Junker et al. (Ex. 1012). Claim 7 is directed to the method of Claim 6 wherein the first and second detectors are operated at substantially the same inspection frequencies. Hölzl discloses the use of the same inspection frequencies. "The reference test specimen should be identical to the test specimen which is actually being tested, this also applies to the measurement conditions, especially the exciter frequency" (c. 3, ll. 12-18).

Claim 8 is obvious over Hölzl (Ex. 1011) in view of Junker et al. (Ex. 1012). Claim 8 depends from Claims 1, 5, and 6 and is directed to the common sense step of operating the

detectors at the same data collection rates. Use of the same data collection rates would be an obvious step for producing a combined data stream. Common sense may support a finding of obviousness. See *Perfect Web Tech.* Moreover, Hölzl states that the reference and test specimen measurement conditions (which would include data collection rate) should be identical (c. 3, ll. 12-18). One would be motivated to use the same data collection rate for the field and lab data to obtain a consistent combined data stream.

Claim 9 is obvious over Hölzl (Ex. 1011) in view of Hedengren et al. (Ex. 1009). Claim 9 is directed to combining only a segment of the data from one of the sites with the data from the other site. In the same field of eddy current testing, Hedengren et al. discloses the use of "a reference structural portion" (i.e. segment) of data for a signal combination process (c. 4, ll. 38-44). It would have been obvious to use segments of the relevant portions of the tubes as opposed to entire signals to produce the desired combined signal for analyst training. Thus, there was an obvious "reason to combine [Hölzl and Hedengren et al.] plus technical ability to optimize."

Claim 10 is obvious over Hölzl (Ex. 1011) in view of any one of Stoor (Ex. 1006), Sullivan et al. (Ex. 1003), Eberhard et al. (Ex. 1007) or Winslow (Ex 1014). Claim 10 is directed to using a mathematical model to create the specimen data. Stoor, Sullivan et al., Eberhard et al. and Winslow, all in the same field as the '269 patent, disclose use of a mathematical or computer simulated flaw. Relevant citations for each reference are in the claim chart below. One would be motivated to use a mathematical model to achieve an "ideal" flaw signature or where an actual flawed component was not available. Thus there was "apparent reason to combine [Hölzl, with either Stoor, Sullivan et al., Eberhard et al. or Winslow] in conjunction with the technical ability to optimize."

Claim 10	Obvious over Hölzl (Ex. 1011) in view of any one of Stoor (Ex. 1006), Sullivan et al. (Ex. 1003), Eberhard et al. (Ex. 1007) or Winslow (Ex. 1014)
The method of claim 1 wherein the specimen is a mathematical model and the data generated from the specimen is generated by the mathematical model.	**Stoor:** NDT simulation data can come from theoretical models (c. 5, ll. 5-17). **Sullivan et al.:** "Computer modeling is a useful tool in providing realistic flaw signals with which eddy current probes can be calibrated" (p. 408). **Eberhard et al.:** "calculating model projection data . . . combining the partial image reconstructed from measured data and model difference image to yield a final image" (c. 2, ll. 39-54). **Winslow:** "A theoretical calibration value and a theoretical nominal value may be calculated using the standard eddy current equations." (p. 15, [0104]).

D. Claim 1 is Obvious over Hedengren et al. (Ex. 1009) in View of any of Hölzl (Ex. 1011), Junker et al. (Ex. 1012), Begley et al. (Ex. 1018) or Sullivan (Ex. 1002).

Hedengren et al. discloses the combination of test and reference signals in non-destructive inspection technique. (Abstract). Hedengren et al. is a simple reversal of the parts of Claim 1. Instead of the lab sample having the flaw, in Hedengren et al., the lab sample is a reference having background elements and the field sample is the sample with the potential flaw. The two signals are combined by subtraction to extract the flaw from the field data. Hedengren et al. simply combines a flaw from the field with noise from the lab instead of vice versa as in Claim 1. This is an obvious substitution of known elements to produce predictable results. See M.P.E.P. §2143(B) citing *In re Fout*, 675 F.2d 297 (CCPA 1982).

Claim 1	Obvious over Hedengren et al. (Ex. 1009) in view of any of Hölzl (Ex. 1011), Junker et al. (Ex. 1012), Begley et al. (Ex. 1018) or Sullivan (Ex. 1002).
A method of synthesizing nondestructive examination data to be used for training data analysts and/or testing inspection techniques comprising the steps of:	Hedengren et al. is directed to an eddy current inspection method (title, abstract) "A straight subtraction of the processed trace from the processed reference trace, or vice versa, is all that is required to produce a <u>combined data set</u> emphasizing the flaw signals represented by

	the differences in the two data sets" (c. 9. ll. 5-9).
generating data collected at a field site of a component from non-destructive examination of the component, which data collected at the field site includes noise;	"The test waveforms are sampled in a conventional manner to acquire a test data set corresponding to each of the test waveform signals." (c. 3, ll. 30-35). The test waveforms contain background noise that will be removed by subtracting a reference signal. (c. 6, ll. 50-53).
creating a specimen that simulates the component undergoing non-destructive examination with a selected flaw;	The reference can be from a "clean slot known to be free from defects" (c. 6, ll. 41-42). Hedengren et al. does not disclose that the lab sample has a flaw. Hölzl, Junker et al., Sullivan and Begley et al. each disclose creating a reference specimen having a flaw. See Hölzl: c. 3, ll. 9-15; Junker et al.: c. 6, ll. 1-9; Begley et al.: p. 2-10, 2-16; and Sullivan: p. 9.
generating nondestructive examination data at a laboratory site, remote from the field site, from the specimen of the component undergoing non-destructive examination;	"The eddy current probe array is employed to likewise scan a reference structural portion to produce a corresponding plurality of background reference data signals (c. 3, ll. 34-39).
and combining at least some of the nondestructive examination data collected at the field site with at least some of the nondestructive examination data collected at the laboratory site to establish a combined data train that reflects the nondestructive examination response to the selected flaw in a background representative of data collected at the field site.	"A straight subtraction of the processed trace from the processed reference trace, or vice versa, is all that is required to produce a <u>combined data set</u> emphasizing the flaw signals represented by the differences in the two data sets" (c. 9. ll. 5-9).

E. Claim 1 is Obvious over Holt (Ex. 1005) in View of Junker et al. (Ex. 1012), Sullivan (Ex. 1002) or Begley et al. (Ex. 1018).

Holt discloses "a method for deriving an eddy current signature of a flaw in a tube proximate a contiguous member which is obscured in the composite signature of the flaw and contiguous member by subtracting [i.e. synthesizing] from the composite [field data] signature a reference eddy current signature generated by a facsimile of the tube and the contiguous member" (abstract). The reference signal does not have a "flaw" per se but the support plate member does adversely affect the eddy current signal. Hölzl, Junker, Sullivan and Begley et

al. each disclose creating a reference specimen having a flaw. The combined data in Holt includes the flaw and background from the field site (abstract). Motivation to combine any one of these references with Holt would be to produce a test signal showing a flaw in the context of noise for training purposes. This is an obvious substitution of known elements to produce predictable results. See M.P.E.P. §2143(B) citing *In re Fout*, 675 F.2d 297 (CCPA 1982).

Claim 1	**Obvious over Holt (Ex. 1005) in view of any of Hölzl (Ex. 1011), Junker et al. (Ex. 1012), Sullivan (Ex. 1002) or Begley et al. (Ex 1018).**
A method of synthesizing nondestructive examination data to be used for training data analysts and/or testing inspection techniques comprising the steps of:	"A method for deriving the eddy current signature of a flaw in a tube proximate a contiguous member which is obscured in the composite signature of the flaw and contiguous member" (abstract).
generating data collected at a field site of a component from non-destructive examination of the component, which data collected at the field site includes noise;	An in-service tube is scanned and an eddy current signal is stored (c. 4, ll. 20-25). The in-service tube has interference from support structures, i.e. noise (c. 5, ll. 40-41).
creating a specimen that simulates the component undergoing non-destructive examination with a selected flaw;	A reference eddy current signal is produced by scanning a reference or facsimile tube having the support plate member. (c.3, ll. 62-67). Hölzl, Junker, Sullivan and Begley et al. each disclose creating a reference specimen having a flaw. See Hölzl: c. 3, ll. 9-15; Junker: c. 6, ll. 1-9; Begley et al.: p. 2-10, 2-16; and Sullivan: p. 9.
generating nondestructive examination data at a laboratory site, remote from the field site, from the specimen of the component undergoing non-destructive examination;	"The reference tube and contiguous member may be adjacent to or remote from the service tube and contiguous member" (c. 4, ll. 9-12).
and combining at least some of the nondestructive examination data collected at the field site with at least some of the nondestructive examination data collected at the laboratory site to establish a combined data train that reflects the nondestructive examination response to the selected flaw in	The reference scan is subtracted from [i.e. combined with] the in-service scan to produce a flaw signal (c. 5, ll. 1-2).

a background representative of data collected at the field site.	

F. Claim 1 Is Obvious over Eberhard et al. (Ex. 1007).

Eberhard et al. discloses a method of synthesizing X-ray computer tomography (CT) data with a computer model for non-destructive testing (abstract). A computer model that simulates the component undergoing test is created (c. 1, ll. 55-57). A combined image is created from the model and the component test data (c. 2, ll. 39-54). The computer model does not have a selected flaw because the object of Eberhard et al. is to find a real flaw in the actual component under test. It would have been obvious to reverse the part in which the flaw occurred (field component versus simulated specimen), because there was a demonstrated need to simulate flaws for training purposes. This is an obvious substitution of known elements to produce predictable results. See M.P.E.P. §2143(B) citing *In re Fout*, 675 F.2d 297 (CCPA 1982).

Claim 1	**Obvious over Eberhard et al. (Ex. 1007)**
A method of synthesizing nondestructive examination data to be used for training data analysts and/or testing inspection techniques comprising the steps of:	Eberhard et al. discloses a method of synthesizing X-ray computer tomography (CT) data for non-destructive testing (abstract).
generating data collected at a field site of a component from non-destructive examination of the component, which data collected at the field site includes noise;	The filed specimen is (CT) scanned with x-rays over an available limited angular range to collect measured projection data (c. 2, ll. 39-42).
creating a specimen that simulates the component undergoing non-destructive examination with a selected flaw;	A computer model that simulates the component undergoing test is created (c. 1, ll. 55-57). The computer model does not have a selected flaw because the object of Eberhard et al. is to find a real flaw in the actual component under test.
generating nondestructive examination data at a laboratory site, remote from the field site, from the specimen of the component undergoing non-destructive examination;	Non-destructive examination data is generated from the computer model because the model is used to reconstruct incomplete image data from the CT scan of the component undergoing examination (c. 2, ll.

	39-54).
and combining at least some of the nondestructive examination data collected at the field site with at least some of the nondestructive examination data collected at the laboratory site to establish a combined data train that reflects the nondestructive examination response to the selected flaw in a background representative of data collected at the field site.	The model projection data and the reconstructed partial image from the CT scan are combined to form a final image (c. 2, ll. 39-54). This final image combines elements of the computer model and the field CT scan data (Fig. 5 showing combination of "measured projection data" with "model projection data" to form a "CT image of part.")

G. Claims 11-13 wherein Claim 11 is Obvious over Sullivan (Ex. 1002) in View of Junker et al. (Ex. 1012).

<u>Claim 11</u> is obvious over Sullivan (Ex. 1002) in view of Junker et al. (Ex. 1012).

Claim 11 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory site and applying first and second calibration factors. Sullivan was demonstrated herein to anticipate Claim 1. The additional limitations are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." Sullivan discloses this step. "[F]ield inspection eddy current signals [are compared with] those calculated using computer modeling codes with both real and simulated signals normalized to that from a common calibration flaw." (p.10). The final limitation of Claim 11 are:

> wherein the calibration is achieved by the steps of operating a first detector used at the field site to non-destructively test a first flaw and provide a first output indicative thereof and adjusting the first output received from the first detector in response to the first flaw by a first calibration factor to modify the first output to exhibit a first characteristic;
>
> and operating a second detector used at the laboratory site to non-destructively test a second flaw which is substantially identical to the first flaw and provide a second output indicative thereof and adjusting the second output by a second calibration factor to modify the second output to exhibit the first characteristic.

Sullivan does not specifically disclose calibration based on measurement of two substantially identical flaws because it states that "both real and simulated (lab) signals are normalized to that from a common calibration flaw. In the same field, Junker et al. discloses calibration of an eddy current testing system to a calibration standard flaw (c.6, ll. 1-15). "Calibration information is taken each time the probe is changed." A calibration standard flaw can inherently be applied with more than one piece of material since by definition the material is a calibration standard. Hence, it would be obvious over Sullivan, which teaches normalization of field and lab data to a single flaw to use calibration standard flaws as taught by Junker et al. A reason to combine these teachings is the convenience and reliability of using calibration standard flaws. Moreover, the use of calibration standards is an obvious step in any measurement process. This is an obvious substitution of known elements (two as opposed to one calibration standard) to produce predictable results. See M.P.E.P. §2143(B) citing *In re Fout*, 675 F.2d 297 (CCPA 1982).

Claim 12 is obvious over Sullivan (Ex. 1002) in view of Junker at al. (Ex. 1012), Hölzl (Ex. 1011) or Winslow (Ex. 1014). Claim 12 depends from Claim 11 and states: "the first and second outputs have corresponding amplitudes for substantially identical flaws." Normalization of two signal measurement devices to exhibit the same response for a given input is an obvious step disclosed in Sullivan (p.10). Signal amplitude is one signal characteristic that is relevant to an eddy current measurement since it affects the shape of the signal. (Junker et al., c. 3 ll. 1-20). This is also disclosed in each of Hölzl (c. 1, ll. 28-32) or Winslow (p. 10, [0060]). Thus there was "reason to combine [Sullivan and Junker et al., Hölzl or Winslow] plus technical ability to optimize."

Claim 13 is obvious over Sullivan (Ex. 1002) in view of Junker at al. (Ex. 1012), Hölzl (Ex. 1011) or Winslow (Ex. 1014). Claim 13 depends from Claim 11 and states: "the first

and second outputs have corresponding orientations for substantially identical flaws." Normalization of two signal measurement devices to exhibit the same response for a given input is an obvious step disclosed in Sullivan (p.10). Signal orientation (phase angle) is one signal characteristic that is relevant to an eddy current measurement since it affects the shape of the signal. (Junker et al., c. 3 ll. 1-20). This is also disclosed in each of Hölzl (c. 1, ll. 28-32) or Winslow (p. 10, [0060]). There was "reason to combine [Sullivan and Junker et al, Hölzl or Winslow] plus technical ability to optimize."

H. Claims 11-13, wherein Claims 11 and 12 are Anticipated by Begley et al. (Ex. 1018).

Claim 11 is anticipated by Begley et al. (Ex. 1018). Claim 11 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory site and applying first and second calibration factors. Begley et al. was demonstrated herein to anticipate Claim 1. The additional limitations are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." Begley et al. discloses this step, see Table 5-10, p.5-58 showing standard calibration flaws at both field and lab sites. The remaining limitations of Claim 11 are:

> wherein the calibration is achieved by the steps of operating a first detector used at the field site to non-destructively test a first flaw and provide a first output indicative thereof and adjusting the first output received from the first detector in response to the first flaw by a first calibration factor to modify the first output to exhibit a first characteristic;
>
> and operating a second detector used at the laboratory site to non-destructively test a second flaw which is substantially identical to the first flaw and provide a second output indicative thereof and adjusting the second output by a second calibration factor to modify the second output to exhibit the first characteristic.

Begley et al. discloses these steps because standard calibration flaws (drilled hole ASME standard) (p. 5-2) were used to calibrate the field and lab data sets. See Table 5-10, p. 5-58.

Claim 12 is anticipated by Begley et al. (Ex. 1018). Claim 12 depends from Claim 11 and states: "the first and second outputs have corresponding amplitudes for substantially identical flaws." Begley et al. discloses normalization as to signal amplitude. See Section 5.1.2. Voltage Analysis, p. 5-2. The "vertical amplitude component . . . is normalized."

Claim 13 is obvious over Begley et al. (Ex. 1018) in view of Junker at al. (Ex. 1012), Hölzl (Ex. 1011) or Winslow (Ex. 1014). Claim 13 depends from Claim 11 and states: "the first and second outputs have corresponding orientations for substantially identical flaws." Begley et al. does not specifically disclose normalization by signal orientation. Signal orientation (phase angle) is one signal characteristic that is relevant to an eddy current measurement since it affects the shape of the signal. (Junker et al., c. 3 ll. 1-20). This is also disclosed in Hölzl (c. 1, ll. 28-32) and Winslow (p. 10, [0060]). Calibrating based on signal orientation would have been obvious when combining two signals to form a synthesized data stream. Thus, there was "reason to combine [Begley et al. and Junker et al., Hölzl or Winslow] plus technical ability to optimize."

I. Claims 11-13 wherein Claim 11 is Obvious over Hölzl (Ex. 1011) in View of Winslow (Ex. 1014) and Junker et al. (Ex. 1012).

Claim 11 is obvious over Hölzl (Ex. 1011) in view of Winslow (Ex. 1014) and Junker et al. (Ex. 1012). Claim 11 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory site and applying first and second calibration factors. Hölzl et al was demonstrated herein to anticipate Claim 1. The additional limitations are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at

the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." The need to calibrate eddy current data to a standard is obvious over Junker et al., which discloses the calibration of an eddy current testing system to a calibration standard having a first flaw (c.6, ll. 1-15). "Calibration information is taken each time the probe is changed." Claim 11includes the use of separate probes for the laboratory and field data acquisitions so it would be obvious to separately calibrate each probe to a standard flaw as disclosed by Junker et al.

The remaining limitations of Claim 11 are:

> wherein the calibration is achieved by the steps of operating a first detector used at the field site to non-destructively test a first flaw and provide a first output indicative thereof and adjusting the first output received from the first detector in response to the first flaw by a first calibration factor to modify the first output to exhibit a first characteristic;
>
> and operating a second detector used at the laboratory site to non-destructively test a second flaw which is substantially identical to the first flaw and provide a second output indicative thereof and adjusting the second output by a second calibration factor to modify the second output to exhibit the first characteristic.

These steps are simply a description of normalizing a measured signal to a standard. This is a well-known technique used whenever a measurement instrument is calibrated. Winslow describes calibration to a standard flaw (p. 15, [0099]) and normalization of amplitude and phase. "[I]t is necessary to establish a nominal phase and amplitude signal representative of a 'perfect' pipe so that an relative change in these values can be determined" (p. 10, [0060]). The combination of Hölzl with Junker et al. and Winslow achieves the obvious goal of ensuring that the lab and field signals are normalized to produce a consistent combined data stream. The combination is obvious because there was "reason to combine the references plus technical ability to optimize."

Claim 12 is obvious over Hölzl (Ex. 1011) in view of Junker et al. (Ex. 1012) or Winslow (Ex. 1014). Claim 12 depends from Claim 11 and states: "the first and second outputs have corresponding amplitudes for substantially identical flaws." Normalization of two signal measurement devices to exhibit the same response for a given input is an obvious step. Signal amplitude is one signal characteristic that is relevant to an eddy current measurement since it affects the shape of the signal. (Junker et al., c. 3 ll. 1-20, Winslow, p. 10, [0060)]. Calibrating based on signal orientation would have been obvious in view of the teaching of Junker et al. or Winslow when combining two signals to form a synthesized data stream. There was "reason to combine [the references] plus technical ability to optimize."

Claim 13 is obvious over Hölzl (Ex. 1011) in view of Junker at al. (Ex. 1012) and Winslow (Ex. 1014). Claim 13 depends from Claim 11 and states: "the first and second outputs have corresponding orientations for substantially identical flaws." Hölzl discloses that signal orientation (phase angle) is one signal characteristic that is relevant to an eddy current measurement since it affects the shape of the signal. (c. 1, ll. 28-32). Calibrating based on signal orientation would have been obvious in view of the teaching of Hölzl when combining two signals to form a synthesized data stream. There was "reason to combine [the references] plus technical ability to optimize."

J. Claim 11 is Obvious over Hedengren et al (Ex. 1009) in view of Winslow (Ex. 1014) and Junker et al. (Ex. 1012).

Claim 11 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory site and applying first and second calibration factors. Claim 1 was demonstrated herein to be obvious over Hedengren in view of Junker et al. The additional limitations are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that

the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." The need to calibrate eddy current data to a standard is obvious over Junker et al., which discloses the calibration of an eddy current testing system to a calibration standard having a first flaw (c. 6, ll. 1-15). "Calibration information is taken each time the probe is changed." Claim 11includes the use of separate probes for the laboratory and field data acquisitions so it would be obvious to separately calibrate each probe to a standard flaw as disclosed by Junker et al.

The remaining limitations of Claim 11 are:

> wherein the calibration is achieved by the steps of operating a first detector used at the field site to non-destructively test a first flaw and provide a first output indicative thereof and adjusting the first output received from the first detector in response to the first flaw by a first calibration factor to modify the first output to exhibit a first characteristic;
>
> and operating a second detector used at the laboratory site to non-destructively test a second flaw which is substantially identical to the first flaw and provide a second output indicative thereof and adjusting the second output by a second calibration factor to modify the second output to exhibit the first characteristic.

These steps are simply a description of normalizing a measured signal to a standard. This is a well-known technique used whenever a measurement instrument is calibrated. Winslow describes calibration to a standard flaw (p. 15, [0099]) and normalization of amplitude and phase. "[I]t is necessary to establish a nominal phase and amplitude signal representative of a 'perfect' pipe so that a relative change in these values can be determined" (p. 10, [0060]). The combination of Hedengren with Junker et al. and Winslow achieves the obvious goal of ensuring that the lab and field signals are normalized to produce a consistent combined data stream. The combination is obvious because there was "reason to combine the references plus technical ability to optimize."

K. Claim 11 is Obvious over Eberhard et al. (Ex. 1007) in View of Winslow (Ex. 1014) and Junker et al (Ex. 1012).

Claim 11 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory site and applying first and second calibration factors. Claim 1 was demonstrated herein to be obvious over Eberhard et al. in view of Junker et al. The additional limitations are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." The need to calibrate eddy current data to a standard is obvious over Junker et al., which discloses the calibration of an eddy current testing system to a calibration standard having a first flaw (c. 6, ll. 1-15). "Calibration information is taken each time the probe is changed." Claim 11includes the use of separate probes for the laboratory and field data acquisitions so it would be obvious to separately calibrate each probe to a standard flaw as disclosed by Junker et al.

The remaining limitations of Claim 11 are:

> wherein the calibration is achieved by the steps of operating a first detector used at the field site to non-destructively test a first flaw and provide a first output indicative thereof and adjusting the first output received from the first detector in response to the first flaw by a first calibration factor to modify the first output to exhibit a first characteristic;
>
> and operating a second detector used at the laboratory site to non-destructively test a second flaw which is substantially identical to the first flaw and provide a second output indicative thereof and adjusting the second output by a second calibration factor to modify the second output to exhibit the first characteristic.

These steps are simply a description of normalizing a measured signal to a standard. This is a well-known technique used whenever a measurement instrument is calibrated. Winslow describes calibration to a standard flaw (p. 15, [0099]) and normalization of amplitude and

phase. "[I]t is necessary to establish a nominal phase and amplitude signal representative of a 'perfect' pipe so that an relative change in these values can be determined" (p. 10, [0060]). The combination of Eberhard et al. with Junker et al. and Winslow achieves the obvious goal of ensuring that the lab and field signals are normalized to produce a consistent combined data stream. The combination is obvious because there was "reason to combine the references plus technical ability to optimize."

L. Claim 11 is Obvious over Holt (Ex. 1005) in View of Winslow (Ex. 1014) and Junker et al. (Ex. 1012).

Claim 11 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory site and applying first and second calibration factors. Claim 1 was demonstrated herein to be obvious over Holt in view of Junker et al. The additional limitations in Claim 11 are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." The need to calibrate eddy current data to a standard is obvious over Junker et al., which discloses the calibration of an eddy current testing system to a calibration standard having a first flaw (c. 6, ll. 1-15). "Calibration information is taken each time the probe is changed." Claim 11includes the use of separate probes for the laboratory and field data acquisitions so it would be obvious to separately calibrate each probe to a standard flaw as disclosed by Junker et al.

The remaining limitations of Claim 11 are:

> wherein the calibration is achieved by the steps of operating a first detector used at the field site to non-destructively test a first flaw and provide a first output indicative thereof and adjusting the first output received from the first detector in response to the first flaw by a first calibration factor to modify the first output to exhibit a first characteristic;

> and operating a second detector used at the laboratory site to non-destructively test a second flaw which is substantially identical to the first flaw and provide a second output indicative thereof and adjusting the second output by a second calibration factor to modify the second output to exhibit the first characteristic.

These steps are simply a description of normalizing a measured signal to a standard. This is a well-known technique used whenever a measurement instrument is calibrated. Winslow describes calibration to a standard flaw (p. 15, [0099]) and normalization of amplitude and phase. "[I]t is necessary to establish a nominal phase and amplitude signal representative of a 'perfect' pipe so that an relative change in these values can be determined" (p. 10, [0060]). The combination of Holt with Junker et al. and Winslow achieves the obvious goal of ensuring that the lab and field signals are normalized to produce a consistent combined data stream. The combination is obvious because there was "reason to combine the references plus technical ability to optimize."

M. Claims 14-18 Where Claim 14 is Obvious over Sullivan (Ex. 1002).

Claim 14 is obvious over Sullivan (Ex. 1002). Claim 14 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory site and then storing the data with the calibration data. Sullivan was demonstrated herein to anticipate Claim 1. The additional limitations in Claim 14 are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." Sullivan discloses this step. "[F]ield inspection eddy current signals [are compared with] those calculated using computer modeling codes with both real and simulated signals normalized to that from a common calibration flaw."

The remaining limitations of Claim 14 are: "storing the data collected at the field site along with a first calibration factor obtained from the step of calibrating the data collected at the field site and storing data collected at the laboratory site along with a second calibration factor obtained from the step of calibrating the data collected at the laboratory site." Both of these steps are obvious common sense measures. One skilled in the art would be motivated to store both the data and the calibration factors to ensure integrity of the data and that the next user of the data was aware of the calibration factor used in obtaining the data. Common sense may support a finding of obviousness. See *Perfect Web Tech.* Sapia (Ex. 1008) also discloses storing "calibration data . . . at the beginning of a data storage tape." (c. 4, ll. 49-51).

Claim 15 is obvious over Sullivan (Ex. 1002). Claim 15 depends from Claim 14 which was shown above to be obvious over Sullivan. Claim 15 states: "identifying in the stored data collected at the field site a location at which the data collected at the laboratory site is to be inserted and inserting the data collected at the laboratory site at the location." Sullivan discloses this step. Sullivan describes selecting a certain portion of a data file with a flaw in it and "adding the result to appropriate sections of a data file generated from a scan of an in-service (i.e. field) tube" (p. 9).

Claim 16 is obvious over Sullivan (Ex. 1002) in view of Junker et al (Ex. 1012). Claim 16 depends from Claim 14 which is shown above to be obvious over Sullivan. Claim 16 states: "identifying in the stored data collected at the laboratory site a location at which the data collected at the field site is to be inserted and inserting the data collected at the field site at the location." Sullivan describes selecting a certain portion of a data file with a flaw in it and "adding the result to appropriate sections of a data file generated from a scan of an in-service (i.e. field) tube" (p. 9). Claim 16 merely reverses which data is inserted. This is an obvious

substitution of known elements to produce predictable results. See M.P.E.P. §2143(B) citing *In re Fout*, 675 F.2d 297 (CCPA 1982).

Claim 17 is obvious over Sullivan (Ex. 1002). Claim 17 depends from Claim 14 which is shown above to be obvious over Sullivan. Claim 17 states: "operating on one of either the data collected at the field site or the data collected at the laboratory site that is to be inserted into the other of the data collected at the field site or the data collected at the laboratory site so that the inserted data is normalized to the same calibration factor as the data the normalized data is inserted in." Normalizing measured data to a calibration factor is an obvious step in any measurement process and is described in Sullivan, p. 10: "both real and simulated signals [are] normalized to that from a common calibration flaw."

Claim 18 is obvious over Sullivan (Ex. 1002). Claim 18 depends from Claim 17 which depends from Claim 14 which is shown above to be obvious over Sullivan. Claim 18 includes the step of storing at least some of the data collected at the laboratory site that is combined with at least some of the data collected at the field site as a file separate from the stored data collected at the field site and the stored data collected at the laboratory site. Where the data is stored is a trivial step with no inventive subject matter. Storing an edited data file in a separate file from the original is an obvious common sense design choice. See M.P.E.P. §2143 citing *Perfect Web Tech.*

N. Claims 14 -18 wherein Claim 14 Is Obvious over Begley et al. (Ex. 1018).

Claim 14 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory site and applying first and second calibration factors and then storing the data with the calibration data. Begley et al. is demonstrated herein to anticipate Claim 1. The additional

limitations in Claim 14 are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." Begley et al. discloses this step, see Table 5-10, p.5-58, showing the use of standard calibration flaws at both the field and lab sites.

The remaining limitations of Claim 14 are: "storing the data collected at the field site along with a first calibration factor obtained from the step of calibrating the data collected at the field site and storing data collected at the laboratory site along with a second calibration factor obtained from the step of calibrating the data collected at the laboratory site." Both of these steps are obvious common sense measures. One skilled in the art would be motivated to store both the data and the calibration factors to ensure integrity of the data and that the next user of the data was aware of the calibration factor used in obtaining the data. Common sense may support a finding of obviousness. See *Perfect Web Tech.* Sapia (Ex. 1008) also discloses storing "calibration data . . . at the beginning of a data storage tape" (c. 4, ll. 49-51).

Claim 15 is obvious over Begley et al. (Ex. 1018). Claim 15 depends from Claim 14 which is shown above to be obvious over Begley et al. Claim 15 states: "identifying in the stored data collected at the field site a location at which the data collected at the laboratory site is to be inserted and inserting the data collected at the laboratory site at the location." Begley et al. discloses this step. Begley et al. describes the editing and insertion of flaw data into field data, into a segmented data set as described on page 5-29, section 5.7.6.2 "Test Data Preparation."

Claim 16 is obvious over Begley et al. (Ex. 1018). Claim 16 depends from Claim 14 which is shown above to be obvious over Begley et al. Claim 16 states: "identifying in the stored data collected at the laboratory site a location at which the data collected at the field site is

to be inserted and inserting the data collected at the field site at the location." Begley et al. describes the editing and insertion of flaw data into field data, into a segmented data set as described on page 5-29, section 5.7.6.2 "Test Data Preparation." Claim 16 merely reverses which data is inserted. This is an obvious substitution of known elements to produce predictable results. See M.P.E.P. §2143(B) citing *In re Fout*, 675 F.2d 297 (CCPA 1982).

Claim 17 is obvious over Begley et al. (Ex. 1018). Claim 17 depends from Claim 14 which is shown above to be obvious over Begley et al. Claim 17 states: "operating on one of either the data collected at the field site or the data collected at the laboratory site that is to be inserted into the other of the data collected at the field site or the data collected at the laboratory site so that the inserted data is normalized to the same calibration factor as the data the normalized data is inserted in." Normalizing measured data to a calibration factor is an obvious step in any measurement process and is described Begley et al. See Section 5.1.2. Voltage Analysis, p. 5-2. The "vertical amplitude component . . . is normalized."

Claim 18 is obvious over Begley et al. (Ex. 1018). Claim 18 depends from Claim 17 which depends from 14 which is shown above to be obvious over Begley et al. Claim 18 states the step of storing at least some of the data collected at the laboratory site that is combined with at least some of the data collected at the field site as a file separate from the stored data collected at the field site and the stored data collected at the laboratory site. Where the data is stored is a trivial step with no inventive subject matter. Storing an edited data file in a separate file from the original is an obvious common sense design choice. See M.P.E.P. §2143 citing *Perfect Web Tech.*

O. Claim 14 Is Obvious over Hölzl (Ex. 1011) in View of Junker et al. (Ex. 1012).

Claim 14 has the exact language of Claim 1, with additional limitations directed to

separately calibrating a detector used at the field site and a second detector used at the laboratory site and applying first and second calibration factors and then storing the data with the calibration data. Hölzl is demonstrated herein to anticipate Claim 1. The additional limitations are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." The need to calibrate eddy current data to a standard is obvious over Junker et al., which discloses the calibration of an eddy current testing system to a calibration standard having a first flaw (c.6, ll. 1-15). "Calibration information is taken each time the probe is changed." Claim 14 includes the use of separate probes for the laboratory and field data acquisitions so it would be obvious to separately calibrate each probe to a standard flaw as disclosed by Junker et al.

The remaining limitations of Claim 14 are: "storing the data collected at the field site along with a first calibration factor obtained from the step of calibrating the data collected at the field site and storing data collected at the laboratory site along with a second calibration factor obtained from the step of calibrating the data collected at the laboratory site." Both of these steps are obvious common sense measures. One skilled in the art would be motivated to store both the data and the calibration factors to ensure integrity of the data and that the next user of the data was aware of the calibration factor used in obtaining the data. Common sense may support a finding of obviousness. See *Perfect Web Tech.* Sapia (Ex. 1008) also discloses storing "calibration data . . . at the beginning of a data storage tape" (c. 4, ll. 49-51).

P. Claim 14 Is Obvious over Eberhard et al. (Ex. 1007) in View of Junker et al. (Ex. 1012).

Claim 14 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory

site and applying first and second calibration factors and then storing the data with the calibration data. Claim 1 is demonstrated herein to be obvious over Eberhard et al. in view of Junker et al. The additional limitations in Claim 14 are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." The need to calibrate eddy current data to a standard is obvious over Junker et al., which discloses the calibration of an eddy current testing system to a calibration standard having a first flaw (c.6, ll. 1-15). "Calibration information is taken each time the probe is changed." Claim 14 includes the use of separate probes for the laboratory and field data acquisitions so it would be obvious to separately calibrate each probe to a standard flaw as disclosed by Junker et al.

The remaining limitations of Claim 14 are: "storing the data collected at the field site along with a first calibration factor obtained from the step of calibrating the data collected at the field site and storing data collected at the laboratory site along with a second calibration factor obtained from the step of calibrating the data collected at the laboratory site." Both of these steps are obvious common sense measures. One skilled in the art would be motivated to store both the data and the calibration factors to ensure integrity of the data and that the next user of the data was aware of the calibration factor used in obtaining the data. Common sense may support a finding of obviousness. See *Perfect Web Tech.* Sapia (Ex. 1008) also discloses storing "calibration data . . . at the beginning of a data storage tape" (c. 4, ll. 49-51).

Q. Claim 14 Is Obvious over Holt (Ex. 1005) in View of Junker et al. (Ex. 1012).

Claim 14 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory

site and applying first and second calibration factors and then storing the data with the calibration data. Claim 1 is demonstrated herein to be obvious over Holt in view of Junker et al. The additional limitations in Claim 14 are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." The need to calibrate eddy current data to a standard is obvious over Junker et al., which discloses the calibration of an eddy current testing system to a calibration standard having a first flaw (c. 6, ll. 1-15). "Calibration information is taken each time the probe is changed." Claim 14 includes the use of separate probes for the laboratory and field data acquisitions so it would be obvious to separately calibrate each probe to a standard flaw as disclosed by Junker et al.

The remaining limitations of Claim 14 are: "storing the data collected at the field site along with a first calibration factor obtained from the step of calibrating the data collected at the field site and storing data collected at the laboratory site along with a second calibration factor obtained from the step of calibrating the data collected at the laboratory site." Both of these steps are obvious common sense measures. One skilled in the art would be motivated to store both the data and the calibration factors to ensure integrity of the data and that the next user of the data was aware of the calibration factor used in obtaining the data. Common sense may support a finding of obviousness. See *Perfect Web Tech.* Sapia (Ex. 1008) also discloses storing "calibration data . . . at the beginning of a data storage tape" (c. 4, ll. 49-51).

R. Claim 14 Is Obvious over Hedengren et al. (Ex. 1009) in View of Junker et al. (Ex. 1012)

Claim 14 has the exact language of Claim 1, with additional limitations directed to separately calibrating a detector used at the field site and a second detector used at the laboratory

site and applying first and second calibration factors and then storing the data with the calibration data. Claim 1 is demonstrated herein to be obvious over Hedengren et al. in view of Junker et al. The additional limitations in Claim 14 are: "separately calibrating the data collected at the field site and the data collected at the laboratory site so that the data collected at the field site and the data collected at the laboratory site have the same relative signal strengths corresponding to a first flaw." The need to calibrate eddy current data to a standard is obvious over Junker et al., which discloses the calibration of an eddy current testing system to a calibration standard having a first flaw (c. 6, ll. 1-15). "Calibration information is taken each time the probe is changed." Claim 14 includes the use of separate probes for the laboratory and field data acquisitions so it would be obvious to separately calibrate each probe to a standard flaw as disclosed by Junker et al.

The remaining limitations of Claim 14 are: "storing the data collected at the field site along with a first calibration factor obtained from the step of calibrating the data collected at the field site and storing data collected at the laboratory site along with a second calibration factor obtained from the step of calibrating the data collected at the laboratory site." Both of these steps are obvious common sense measures. One skilled in the art would be motivated to store both the data and the calibration factors to ensure integrity of the data and that the next user of the data was aware of the calibration factor used in obtaining the data. Common sense may support a finding of obviousness. See *Perfect Web Tech.* Sapia (Ex. 1008) also discloses storing "calibration data . . . at the beginning of a data storage tape" (c. 4, ll. 49-51).

S. Claim 15 is Obvious Over Each of Hölzl (Ex. 1011), Holt (Ex. 1005), Eberhard et al. (Ex. 1007), or Hedengren et al. (Ex. 1009) in view of Junker et al. (Ex. 1012) and in further view of Sullivan (Ex. 1002) or Begley et al. (Ex. 1018).

Claim 15 depends from Claim 14 which is demonstrated to be obvious over Hölzl, Holt,

Eberhard et al. or Hedengren et al., each in view of Junker et al. as discussed above. Claim 15 states: "identifying in the stored data collected at the field site a location at which the data collected at the laboratory site is to be inserted and inserting the data collected at the laboratory site at the location." Sullivan discloses this step. Sullivan describes selecting a certain portion of a data file with a flaw in it and "adding the result to appropriate sections of a data file generated from a scan of an in-service (i.e. field) tube" (p. 9). Begley et al. also discloses this step. Begley et al. describes the editing and insertion of flaw data into field data, into a segmented data set is described on page 5-29, section 5.7.6.2 "Test Data Preparation."

T. Claim 16 is Obvious Over Each of Hölzl (Ex. 1011), Holt (Ex. 1005), Eberhard et al. (Ex. 1007), or Hedengren et al. (Ex. 1009) in view of Junker et al. (Ex. 1012).

Claim 16 depends from Claim 14. Claim 14 is shown to be obvious over Hölzl, Holt, Eberhard et al. or Hedengren et al., each in view of Junker et al. as discussed above. Claim 16 merely reverses which data is inserted as described in Claim 15 and thus is obvious in view of Sullivan or Begley et al. as described for Claim 15 and because Claim 16 is an obvious substitution of known elements (which elements are inserted and which are the main data set) to produce predictable results. See M.P.E.P. §2143(B) citing *In re Fout*, 675 F.2d 297 (CCPA 1982).

U. Claim 17 is Obvious Over Each of Hölzl (Ex. 1011), Holt (Ex. 1005), Eberhard (Ex. 1007), or Hedengren (Ex. 1009) in view of Junker et al. (Ex. 1012) and in further view of Sullivan (Ex. 1002) or Begley et al (Ex. 1018).

Claim 17 depends from Claim 14 which is shown above to be obvious over Hölzl, Holt Eberhard et al. or Hedengren et al., each in view of Junker et al. as discussed above. Claim 17 states: "operating on one of either the data collected at the field site or the data collected at the

laboratory site that is to be inserted into the other of the data collected at the field site or the data collected at the laboratory site so that the inserted data is normalized to the same calibration factor as the data the normalized data is inserted in." Normalizing measured data to a calibration factor is an obvious step in any measurement process and is described in Sullivan, p. 10: "both real and simulated signals [are] normalized to that from a common calibration flaw." Normalizing is also described in Begley et al. See Section 5.1.2. Voltage Analysis, p. 5-2. The "vertical amplitude component . . . is normalized." One skilled in the art would normalize the data sets to produce a consistent combined data stream. Thus there was "reason to combine the references plus technical ability to optimize."

V. Claim 18 is Obvious over each of Hölzl (Ex. 1011), Holt (Ex. 1005), Eberhard et al. (Ex. 1007), or Hedengren et al. (Ex. 1009) in view of Junker et al. (Ex. 1012).

Claim 18 depends from Claim 14. Claim 14 is shown above to be obvious over Hölzl, Holt, Eberhard et al. or Hedengren et al., each in view of Junker et al. as discussed above. Claim 18 states the step of storing at least some of the data collected at the laboratory site that is combined with at least some of the data collected at the field site as a file separate from the stored data collected at the field site and the stored data collected at the laboratory site. Where the data is stored is a trivial step with no inventive subject matter. Storing an edited data file in a separate file from the original is an obvious common sense design choice. See M.P.E.P. §2143 citing *Perfect Web Tech.*

W. Claim 15 is Obvious over each of Hölzl (Ex. 1011), Holt (Ex. 1005), Eberhard et al. (Ex. 1007), or Hedengren et al. (Ex. 1009) in view of Junker et al. (Ex. 1012).

Claim 15 depends from Claim 14 which was shown above to be obvious over Hölzl, Holt, Eberhard or Hedengren, each in view of Junker et al. as discussed above. Claim 15 states:

"identifying in the stored data collected at the field site a location at which the data collected at the laboratory site is to be inserted and inserting the data collected at the laboratory site at the location." This step is a common sense step in view of Junker et al. which teaches the repositioning of segments of eddy current data: "the component signals are constructed piece by piece from signature segments three data points each. Segments are grouped into signals according to phase angle" (c. 18, ll. 42-45) [i.e. a location is identified at which the segments are to be inserted]. Common sense is a rationale for a finding of obviousness, see M.P.E.P. §2143 citing *Perfect Web Tech.*

X. Claim 16 is Obvious over each of Hölzl (Ex. 1011), Holt (Ex. 1005), Eberhard et al. (Ex. 1007), or Hedengren et al. (Ex. 1009) in view of Junker et al. (Ex. 1012).

Claim 16 depends from Claim 14 which is shown above to be obvious over Hölzl, Holt, Eberhard et al. or Hedengren et al., each in view of Junker et al. as discussed above. Claim 16 states: "Identifying in the stored data collected at the laboratory site a location at which the data collected at the field site is to be inserted and inserting the data collected at the field site at the location." This step is a common sense step in view of Junker et al. which teaches the repositioning of segments of eddy current data: "the component signals are constructed piece by piece from signature segments three data points each. Segments are grouped into signals according to phase angle (c. 18, ll. 42-45) [i.e. a location is identified at which the segments are to be inserted]. Common sense is a rationale for a finding of obviousness, see M.P.E.P. §2143 citing *Perfect Web Tech.*

Y. Claim 17 is Obvious over each of Hölzl (Ex. 1011), Holt (Ex. 1005), Eberhard (Ex. 1007), or Hedengren (Ex. 1009) in view of Junker et al. (Ex. 1012).

Claim 17 depends from Claim 14 which is shown above to be obvious over Hölzl, Holt

Eberhard et al. or Hedengren et al., each in view of Junker et al. as discussed above. Claim 17 states: "operating on one of either the data collected at the field site or the data collected at the laboratory site that is to be inserted into the other of the data collected at the field site or the data collected at the laboratory site so that the inserted data is normalized to the same calibration factor as the data the normalized data is inserted in." Normalizing measured data to a calibration factor is an obvious step in any measurement process and is obvious over Junker et al., which discloses the calibration of an eddy current testing system to a calibration standard having a first flaw (c. 6, ll. 1-15). "Calibration information is taken each time the probe is changed." One skilled in the art would normalize the data sets to produce a consistent combined data stream. Thus there was "reason to combine the references plus technical ability to optimize."

VII. CONCLUSION

In light of the foregoing, it is respectfully submitted that Petitioner has shown that there is a reasonable likelihood that at least one claim of the '269 patent is unpatentable under 37 C.F.R. §42.104(b)(4) and that Petitioner's request for an *Inter Partes* Review should be granted and that Claims 1-18 be found unpatentable as either anticipated or obvious as set forth above.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that the foregoing Amended Petition for *Inter Partes* Review Under 37 C.F.R. §42.100 is being served via Federal Express on this 6th day of February, 2014 in an envelope addressed to:

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