

PGS GEOPHYSICAL AS, Appellant

v.

**Andrei IANCU, Under Secretary of Commerce for Intellectual
Property and Director of the United States Patent and
Trademark Office, Intervenor.**

[2016-2470](#), [2016-2472](#), [2016-2474](#).

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United States Court of Appeals, Federal Circuit. *1355

Decided: June 7, 2018.

Appeals from the United States Patent and Trademark Office, Patent Trial and
Appeal Board in Nos. IPR2015-00309, IPR2015-00310, IPR2015-00311.

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DAVID I. BERL, Williams & Connolly LLP, Washington, DC, argued for appellant.
*1357 Also represented by JESSAMYN SHELI BERNIKER, DAVID M. KRINSKY,
JAMES MATTHEW RICE.

MONICA BARNES LATEEF, Office of the Solicitor, United States Patent and
Trademark Office, Alexandria, VA, argued for intervenor. Also represented by
NATHAN K. KELLEY, THOMAS W. KRAUSE, MEREDITH HOPE
SCHOENFELD.

Before Wallach, Taranto, and Stoll, Circuit Judges.

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*1356 Taranto, Circuit Judge.

PGS Geophysical AS owns U.S. Patent No. 6,906,981, which describes and
claims methods and systems for performing "marine seismic surveying" to
determine the structure of earth formations below the seabed. WesternGeco,
L.L.C., a competitor of PGS's, filed three petitions requesting inter partes reviews
(IPRs) of claims 1-38 of the '981 patent. The Patent Trial and Appeal Board of the
Patent and Trademark Office (PTO), acting as the PTO Director's delegate,
instituted three IPRs, but it specified for review only some of the claims
WesternGeco challenged and only some of the grounds for WesternGeco's
challenges, not all claims or all grounds. In its final written decisions in the IPRs,
the Board ruled partly for PGS and partly for WesternGeco on the reviewed claims
and grounds. Both PGS and WesternGeco appealed, but WesternGeco then
settled with PGS and withdrew, leaving only PGS's appeals as to certain claims of
the '981 patent that the Board ruled unpatentable for obviousness. The Director
intervened to defend the Board's decisions. 35 U.S.C. § 143.

We affirm. We first conclude that, although [SAS Institute, Inc. v. Iancu](#), U.S.
138 S.Ct. 1348, 200 L.Ed.2d 695 (2018), now makes clear that the Board
erred in limiting the scope of the IPRs it instituted and hence the scope of its final
written decisions, we have jurisdiction to address the merits of the Board's final
written decisions and that we need not, and will not, sua sponte revive the "non-
instituted" claims and grounds. We then conclude that the Board committed no
error justifying disturbance of its obviousness decisions on their merits.

A

In the invention of the '981 patent, both seismic energy sources and seismic energy sensors are towed behind moving boats, the seismic sources are fired in a specific manner, and the sensors receive energy reflecting off earth formations below the seabed — the results being informative about the structure of those formations. '981 patent, Abstract; *id.*, col. 1, lines 50-52. More particularly, the invention uses multiple seismic sources that are spaced apart "at a selected distance." *Id.*, col. 2, lines 42-47. The "seismic energy sources such as air guns and water guns... are fired substantially simultaneously," *id.*, col. 4, lines 4-6, but with a short, predetermined time delay that is typically "less than one second," *id.*, col. 6, lines 18-20. "Firing the first source, waiting the predetermined delay and firing the second source thereafter is referred to ... as a `firing sequence.'" *Id.*, col. 5, line 67 through col. 6, line 2. The claimed methods use multiple firing sequences, and the time delay "is different for each successive firing sequence." *Id.*, col. 6, lines 4-9. "The delay times may be random, quasi-random or systematically determined ... and only *1358 need to be known." *Id.*, col. 10, lines 39-41. "[S]eismic sensors (typically hydrophones)" capture the acoustic response from underground rock formations. *Id.*, col. 4, lines 21-23,

Because the sources are fired (shot) in close temporal proximity, the responses from multiple shots will overlap. The use of known time delays between shots allows the "signals from each of the plurality of sources [to] be uniquely identified in a shot sequence" when post-processing the data. *Id.*, col. 10, lines 56-62. Time delays are one form of "encoding" the data to allow such identification, which is then "decoded" in post-processing. PGS Br. 8-9, 13.

It is desirable to record the response of multiple shots "to reduce the effects of noise and acquire a higher quality seismic representation of a particular subsurface structure." '981 patent, col. 2, lines 7-15. By isolating the seismic sources and "summing or `stacking" the recorded responses, the signal-to-noise ratio is increased for the response from each seismic source, which results in better imaging of the sub-surface structures. *Id.*; PGS Br. 14-15. The use of multiple shots fired in close temporal proximity makes the surveying process more efficient. PGS Br. 7-8; see also '981 patent, col. 10, lines 52-64.

Use of time-delay encoding in marine seismic surveying, where the seismic sources are moving (as they are towed behind a boat), can result in reduced spatial resolution of the data. Because the sources are towed behind moving vessels, each shot in a firing sequence is taken from a slightly different location. This can result in "spatial-reflection point smearing" (smearing) when the individual shot records are later summed together. PGS Br. 5, 12-13.

Several of the '981 patent's claims are at issue here. Claim 31 is illustrative for present purposes:

31. A method for determining signal components attributable to a first seismic energy source and to a second seismic energy source in signals recorded from seismic sensors, the first and second sources and the sensors towed along a survey line, the first source and the second source fired in a plurality of sequences, a time delay between firing the first source and the second source in each firing sequence being different than the time delay in other ones of the firing sequences, the method comprising:

determining a first component of the recorded signals that is coherent from shot to shot and from trace to trace;

time aligning the recorded signals with respect to a firing time of the second source in each firing sequence; and

determining a second component of the signals that is coherent from shot to shot and from trace to trace in the time aligned signals.

'981 patent, col. 13, lines 6-22.

B

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In November 2014, WesternGeco filed three petitions requesting IPRs of claims 1-38 of the '981 patent — the first covering claims 1-22, the second covering claims 23-30, the third covering claims 31-38. In each petition, WesternGeco set forth the same three grounds. In June 2015, the Board instituted three IPRs covering various claims and only some grounds. In IPR2015-00309, the Board instituted a review of claims 1-7, 10-22; in IPR2015-00310, it instituted a review of claims 23-30; and in IPR2015-00311, it instituted a review of claims 31-38. The Board did not institute on all claims or all grounds set forth by WesternGeco: for example, the Board did not institute on claims 8 and 9, which were challenged in the first petition — the subject of IPR2015-00309; and it did not institute on Ground 2 set forth in all three petitions.

On June 8, 2016, the Board issued three final written decisions. For purposes of these appeals, the Board's reasoning is substantially similar in the three decisions.^[1] The Board determined that claims 1, 2, 7, 10, 11, 16, 21, 23, 24, and 30 are unpatentable as anticipated by U.S. Patent No. 6,545,944. The Board also determined that claims 1, 2, 6, 16, 17, 21-24, 28, 29, 31, 32, and 35-37 are unpatentable for obviousness over U.S. Patent Nos. 5,924,049 (Beasley) and 4,953,657 (Edington).

On appeal, PGS does not challenge the ruling on anticipation. PGS challenges only the two-reference obviousness ruling, and only as to claims 6, 17, 22, 28, 29, 31, 32, and 35-37. Beasley addresses "seismic survey systems and methods in which two or more seismic sources are fired simultaneously, or significantly close together temporally," and "3-D marine seismic survey" applications. Beasley, col. 1, lines 19-27. Edington describes "a method of separating for analysis seismic signals received from multiple seismic sources which are activated substantially simultaneously," col. 1, lines 7-10, using "determinable time delay[s]," col. 2, lines 1-13, 28-41. PGS's argument on appeal is that the Board erred in finding a motivation to combine Beasley and Edington and, more particularly, in finding that smearing would not have deterred the making of that combination.

II

We first consider whether we have jurisdiction to address PGS's appeals and whether, if so, we may and should decide those appeals and do so without sua sponte remanding for the Board to address the claims and grounds that WesternGeco included in its petitions but that the Board excluded from the IPRs. Both PGS and the Director answer yes to those questions. So do we.

The issue arises because of the Supreme Court's recent decision in *SAS*, which

held that the IPR statute does not permit a partial institution on an IPR petition of the sort presented here. [138 S.Ct. at 1352-54](#). Neither PGS nor the Director asks for any SAS-based action — whether to block our deciding the appeal on the instituted claims and grounds or to revive the "non-instituted" claims or grounds. Nor has a request for SAS-based relief been filed by WesternGeco, which settled with PGS and withdrew from the appeals long ago.

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We will treat claims and grounds the same in considering the SAS issues currently before us. In light of SAS, the PTO issued a "Guidance" declaring that the Board will now institute on all claims and all grounds included in a petition if it institutes at all. PTO, Guidance on the impact of SAS on AIA trial proceedings *1360 (Apr. 26, 2018).^[2] The cases currently in this court, which emerged from the Board under pre-SAS practice, raise certain transition issues. We will address those issues without distinguishing non-instituted claims from non-instituted grounds.

Equal treatment of claims and grounds for institution purposes has pervasive support in SAS. Although 35 U.S.C. § 318(a), the primary statutory ground of decision, speaks only of deciding all challenged and added "claim[s]," the Supreme Court spoke more broadly when considering other aspects of the statutory regime, and it did so repeatedly. The Court wrote that "the petitioner is master of its complaint and normally entitled to judgment on all of the claims it raises." [SAS, 138 S.Ct. at 1355](#). It said that § 312 contemplates a review "guided by a petition describing `each claim challenged' and `the grounds on which the challenge to each claim is based,'" and it added that the Director does not "get[] to define the contours of the proceeding." *Id.* The Court also said that § 314's language "indicates a binary choice — either institute review or don't." *Id.* It further reasoned that "[n]othing suggests the Director enjoys a license to depart from the petition and institute a *different* inter partes review of his own design" and that "Congress didn't choose to pursue" a statute that "allows the Director to institute proceedings on a claim-by-claim and ground-by-ground basis" as in *ex parte* reexamination. *Id.* at 1356 (emphasis in original). And the Court concluded that "the petitioner's petition, not the Director's discretion, is supposed to guide the life of the litigation," *id.*, and the "petitioner's contentions ... define the scope of the litigation all the way from institution through to conclusion," *id.* at 1357.

We read those and other similar portions of the SAS opinion as interpreting the statute to require a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition, and we have seen no basis for a contrary understanding of the statute in light of SAS. We note that it is a distinct question (not presented here) whether, after instituting on the entire petition, the Board, in a final written decision, may decide the merits of certain challenges and then find others moot, the latter subject to revival if appellate review of the decided challenges renders the undecided ones no longer moot. We conclude, based on our understanding of the statute in light of SAS, that the SAS transition issues about institution arise in all three appeals before us, given the Board's denial of institution on Ground 2 in all three petitions, not only in the appeal from IPR2015-00309, which included fewer than all challenged claims.

B

We conclude that we have jurisdiction to rule on the appeals, *i.e.*, that the

existence of non-instituted claims and grounds does not deprive us of jurisdiction to decide PGS's appeals. Under 28 U.S.C. § 1295(a)(4)(A), this court has "exclusive jurisdiction ... of an appeal from a decision of ... the [Board] with respect to [an]... inter partes review under title 35." "We have held that § 1295(a)(4) should be read to incorporate a finality requirement." [In re Arunachalam](#), 824 F.3d 987, 988 (Fed. Cir. 2016) (quoting [Loughlin v. *1361 Ling](#), 684 F.3d 1289, 1292 (Fed. Cir. 2012)); see [Arthrex, Inc. v. Smith & Nephew, Inc.](#), 880 F.3d 1345, 1348 (Fed. Cir. 2018). There is finality here: the combination of the non-institution decisions and the final written decisions on the instituted claims and grounds "terminated the IPR proceeding[s]" that are now on appeal. [Arthrex](#), 880 F.3d at 1348.

The standard for "final agency action" under the Administrative Procedure Act (APA), 5 U.S.C. § 704, is met. Generally, agency action is final when the agency's decision-making process is complete and the action determines legal "rights or obligations" or otherwise gives rise to "legal consequences." [U.S. Army Corps of Eng'rs v. Hawkes Co.](#), ___ U.S. ___, 136 S.Ct. 1807, 1813, 195 L.Ed.2d 77 (2016) (citing [Bennett v. Spear](#), 520 U.S. 154, 177-78, 117 S.Ct. 1154, 137 L.Ed.2d 281 (1997)). Here, the Board issued an institution decision and a final written decision in each IPR. In each matter, the Board's decisions are final, even if erroneous, because they "terminated the IPR proceeding" as to all claims and all grounds, [Arthrex](#), 880 F.3d at 1348, and the Board made patentability determinations that affect the patent rights of PGS, [Automated Merch. Sys., Inc. v. Lee](#), 782 F.3d 1376, 1381 (Fed. Cir. 2015). We note that, in SAS, the Court reviewed the Board's decisions under the APA, 5 U.S.C. § 706(2)(A) and (C), see [138 S.Ct. at 1359](#), and despite concluding that the Board erred in its institution decision by denying review of some challenged claims, the Court nowhere suggested either the absence of a "final agency action" or the absence of jurisdiction on this court's part.

Finality is also seen by drawing on the analogy to civil litigation the Court invoked in SAS. What the Board did here is analogous to a situation in which a district court, upon receipt of a two-count complaint, incorrectly dismisses one count early in the case (without prejudice to refiling in that forum or elsewhere) and proceeds to a merits judgment on the second count. Once the second count is finally resolved, there would be a final judgment in that situation, with both counts subject to appeal. The early dismissal would be final as to that claim, see [United States v. Wallace & Tiernan Co.](#), 336 U.S. 793, 794 n.1, 69 S.Ct. 824, 93 L.Ed. 1042 (1949) (involuntary dismissal without prejudice is reviewable final judgment if it stands alone); [H.R. Techs., Inc. v. Astechologies, Inc.](#), 275 F.3d 1378, 1383 (Fed. Cir. 2002) (same); [Cyprus Amax Coal Co. v. United States](#), 205 F.3d 1369, 1372 (Fed. Cir. 2000) (same), though not immediately reviewable. Under broadly recognized principles addressing review of partial dispositions once the rest of the case is resolved, see 15A Charles A. Wright & Arthur R. Miller, *Federal Practice and Procedure* §§ 3914.7, 3914.9 (2d ed. 2018), the early dismissal would become reviewable upon "the entry of a judgment adjudicating all the claims," Fed. R. Civ. P. 54(b). See, e.g., [Herdrich v. Pegram](#), 154 F.3d 362, 367-68 (7th Cir. 1998), *rev'd on other grounds*, 530 U.S. 211, 120 S.Ct. 2143, 147 L.Ed.2d 164 (2000). Indeed, this court has held that even a voluntary dismissal without prejudice of some claims, when all the other claims in the case have been adjudicated on their merits, results in a final judgment. See [Atlas IP, LLC v. Medtronic Inc.](#), 809 F.3d 599, 604-05 (Fed. Cir. 2015); [Doe v. United States](#), 513 F.3d 1348, 1352-54 (Fed. Cir. 2008).

No different analysis is warranted for what the Board did here. In two stages, the

Board finally disposed of all the challenges (*i.e.*, claims and grounds) in the *1362 petitions placed before it. Some of what the Board did is now seen to be legally erroneous under SAS, but legal error does not mean lack of finality. For those reasons, we conclude that we have jurisdiction to hear PGS's appeals.

C

Having found jurisdiction, we readily conclude that we may decide PGS's appeals of the Board decisions and that we need not reopen the non-instituted claims and grounds. In this case, no party seeks SAS-based relief. We do not rule on whether a different conclusion might be warranted in a case in which a party has sought SAS-based relief from us.

We have uncovered no legal authority that requires us *sua sponte* to treat the Board's incorrect denial of institution as to some claims and grounds either as a basis for disturbing or declining to review the Board's rulings on the instituted claims and grounds or as a basis for reopening the IPRs to embrace the non-instituted claims and grounds. Even if the Board could be said to have acted "ultra vires" in refusing to institute reviews of some claims and grounds — and then proceeding to merits decisions concerning the claims and grounds included in the instituted reviews — the Board's error is waivable, not one we are required to notice and act on in the absence of an appropriate request for relief on that basis. See [CBS Broad., Inc. v. EchoStar Commc'ns Corp.](#), 450 F.3d 505, 520 n.27 (11th Cir. 2006) (finding challenge to FCC action as ultra vires waived). Several courts of appeals have recognized the same for a challenge to an agency's "jurisdiction," after the Supreme Court, in [City of Arlington v. FCC](#), 569 U.S. 290, 297-98, 133 S.Ct. 1863, 185 L.Ed.2d 941 (2013), rejected a distinction between agency "jurisdiction" errors and other errors for certain deference purposes and treated the label "ultra vires" as embracing any "improper" agency action.^[3] See, e.g., [Metro-N. Commuter R.R. Co. v. U.S. Dep't of Labor](#), 886 F.3d 97, 108 (2d Cir. 2018) (finding waiver of challenge to agency jurisdiction); [1621 Route 22 W. Operating Co. v. NLRB](#), 825 F.3d 128, 140-43 (3d Cir. 2016) (same). Moreover, the Supreme Court in SAS characterized the error at issue here as an error under 5 U.S.C. § 706, but errors under that provision are generally subject to a traditional harmless-error analysis, with challengers of the agency action having the burden of showing prejudice. See [Shinseki v. Sanders](#), 556 U.S. 396, 406, 409, 129 S.Ct. 1696, 173 L.Ed.2d 532 (2009); [Suntec Indus. Co. v. United States](#), 857 F.3d 1363, 1368 (Fed. Cir. 2017). That burden assignment further suggests that the SAS error is not one that must be recognized *sua sponte*.

In the absence of an obligation to act *sua sponte*, we will not *sua sponte* exercise *1363 any discretion to decline to decide the appeals on the instituted claims and grounds. There is a clear private and public interest in our deciding the patentability issues before us. Nor will we exercise any discretion to revive the non-instituted claims and grounds. Finality and expedition interests strongly counsel against such action. And so does the Court's emphasis in SAS on the petitioner's control of the contours of the proceeding.

III

As relevant here, "[t]he obviousness inquiry entails consideration of whether a person of ordinary skill in the art would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and ...

would have had a reasonable expectation of success in doing so." [Insite Vision Inc. v. Sandoz, Inc.](#), 783 F.3d 853, 859 (Fed. Cir. 2015) (internal quotation marks and citation omitted). Such a motivation and reasonable expectation may be present where the claimed invention is the "combination of familiar elements according to known methods" that "does no more than yield predictable results." [KSR Int'l Co. v. Teleflex, Inc.](#), 550 U.S. 398, 415-16, 127 S.Ct. 1727, 167 L.Ed.2d 705 (2007). Whether there would have been such a motivation on the relevant priority date is an issue of fact, and we review the Board's finding on the issue for substantial-evidence support. *Skky, Inc. v. MindGeek, s.a.r.l.*, 859 F.3d 1014, 1021 (Fed. Cir. 2017), *cert. denied*, ___ U.S. ___, 138 S.Ct. 1693, ___ L.Ed.2d 2018 WL 1994802 (U.S. Apr. 30, 2018) (No. 17-349). "Substantial evidence ... means such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." [Consol. Edison Co. of N.Y. v. NLRB](#), 305 U.S. 197, 229, 59 S.Ct. 206, 83 L.Ed. 126 (1938); *Skky, Inc.*, 859 F.3d at 1021.

PGS does not here dispute that the combination of Beasley and Edington teaches all of the limitations of the challenged claims. The Board found that PGS had waived any contrary argument for all claims now on appeal except claims 36 and 37. 309 *Final Decision*, 2016 WL 3193820, at *10-11, *17 (discussing claims 6, 17, and 22); 310 *Final Decision*, 2016 WL 3193821, at *9, *15 (discussing claims 28 and 29); 311 *Final Decision*, 2016 WL 3193823, at *6, *12 (discussing claims 31, 32, and 35). As to claims 36 and 37, PGS argued that the combination of Beasley and Edington failed to teach limitations relating to the use of common mid-point (CMP) gathers, but the Board found otherwise — specifically, that those limitations were disclosed in Beasley. 311 *Final Decision*, 2016 WL 3193823, at *12. PGS does not challenge that finding.

On appeal, PGS argues that the Board erred regarding the needed motivation to combine Beasley and Edington, including by not adequately addressing the problem of smearing. We reject PGS's challenge.

A

In its petitions, WesternGeco relied for the motivation to combine on the express suggestion in Beasley that its systems and methods could use various types of encoding — of which the use of time delays taught in Edington was one known type. J.A. 171.^[4] WesternGeco argued that, given Beasley's disclosure, "[i]t would have been ¹³⁶⁴obvious to employ the known time encoding techniques disclosed in Edington in the system of Beasley to achieve the predictable result of distinguishing sources that are fired either simultaneously or near simultaneously." J.A. 172-73. That contention, as PGS noted, was "[t]he linchpin of WesternGeco's obviousness case." J.A. 261. The Board found WesternGeco's argument persuasive, and we conclude that substantial evidence supports the Board's finding of a motivation to combine.

Beasley states: "If desired, the leading and trailing sources may be arranged to emit encoded wavefields *using any desired type of coding*. The respective sources are then programmed to be activated concurrently instead of sequentially." Beasley, col. 7, lines 54-58 (emphasis added). According to Beasley, "[t]he advantage to that technique is that the subsurface incident points have improved commonality since there is no time shift and therefore no spatial reflection-point smearing between successive ... source activations." *Id.*, col. 7, lines 59-63. The Board found a motivation to make the combination in those disclosures. 309 *Final Decision*, 2016 WL 3193820, at *12; *see also id.* at *10

(describing Beasley). It stated: "The issue in dispute is what Beasley means by 'using any type of coding' and 'activated concurrently instead of sequentially.'" *309 Final Decision*, 2016 WL 3193820, at *12.

On the question of what Beasley teaches, which is a factual question, see, e.g., [In re Fulton](#), 391 F.3d 1195, 1199-200 (Fed. Cir. 2004), we conclude that the Board's finding rests on a reasonable reading of Beasley. First, the Board found that "Beasley does not exclude time delay encoding from its disclosed 'concurrent' activation embodiments." *Id.* at *13. The Board cited several portions of Beasley stating that the sources may be fired "simultaneously or nearly simultaneously," *id.* (citing Beasley, col. 8, lines 46-47), and that the "seismic sources are fired simultaneously, or significantly close together temporally," *id.* (citing Beasley, col. 1, lines 19-25). See also Beasley, Abstract ("simultaneously or nearly simultaneously"); col. 9, lines 6-10 (same); col. 1, lines 47-51 ("simultaneously or temporally close together"); col. 4, lines 49-50 ("substantially simultaneously"); col. 12, lines 26-29 (same); col. 13, lines 23-24 ("temporally substantially simultaneously"). Beasley can reasonably be read to contemplate small time delays within its concurrent-firing embodiment; substantial evidence supports the Board's finding that Beasley is not limited to exactly concurrent firing.

Second, the Board found that Edington's time-delay encoding is a type of source signature encoding, as required by Beasley. *309 Final Decision*, 2016 WL 3193820, at *14. "Beasley distinguishes between 'a signal with no encoded feature, individual identifier, tag, discriminating feature, or separate signature' and 'signals that can be discriminated from each other due to some identifying characteristic, parameter, signature or feature.'" *Id.* (quoting Beasley, col. 9, line 67 through col. 10, line 8) (emphasis omitted). In describing Edington, the Board found that its "time delays allow separation of the recorded signals based on the source even when the sources are activated substantially simultaneously." *Id.* at *10. PGS does not dispute that finding. And it is supported by the statement of PGS's expert, Dr. Lynn, that "Edington's time delay source coding is 'a type of source signature encoding.'" *Id.* at *14 (quoting J.A. 901 at 148:18-23).

1365 *1365 PGS contends that the Board did not really make the needed motivation finding. It cites decisions in which we have explained that the finder of fact in a case like this must go beyond the question of whether one of ordinary skill in the art could have combined the references at issue (in the way claimed) to answer the question of whether such an artisan would have been motivated to do so. See, e.g., [Personal Web Techs., LLC v. Apple, Inc.](#), 848 F.3d 987, 993-94 (Fed. Cir. 2017); [InTouch Techs., Inc. v. VGO Commc'ns, Inc.](#), 751 F.3d 1327, 1352 (Fed. Cir. 2014). Although the questions are related, clarity in distinguishing them is important, and its absence has sometimes justified a remand. E.g., [Personal Web](#), 848 F.3d at 994. Nevertheless, while "we may not supply a reasoned basis for the agency's action that the agency itself has not given, we will uphold a decision of less than ideal clarity if the agency's path may reasonably be discerned." [Bowman Transp., Inc. v. Arkansas-Best Freight Sys., Inc.](#), 419 U.S. 281, 286, 95 S.Ct. 438, 42 L.Ed.2d 447 (1974) (citing [SEC v. Chenery Corp.](#), 332 U.S. 194, 196-97, 67 S.Ct. 1760, 91 L.Ed. 1995 (1947)); [In re NuVasive, Inc.](#), 842 F.3d 1376, 1383 (Fed. Cir. 2016). And in this case, we think that, in the end, the Board did not fail to address the motivation question.

We understand the Board to have answered that question. Immediately after stating that PGS "does not dispute Petitioner's assertion that the combination of Beasley and Edington describes each element of independent claim 1, but merely asserts that an ordinarily skilled artisan would not have combined Beasley and

Edington," it concluded: "Accordingly, upon reviewing the record developed during trial, we are persuaded by Petitioner's position regarding the relevant teachings of Beasley and Edington and address in detail only the disputed issues relating to the combinability of Beasley and Edington." *309 Final Decision*, 2016 WL 3193820, at *11. The Board also affirmatively focused on the "other types of encoding" language of Beasley as an affirmative suggestion to look elsewhere, especially to a time-delay reference, in light of Beasley's contemplation of small time delays between firing seismic sources, as we have discussed. "[T]he motivation to modify a reference can come from the knowledge of those skilled in the art, from the prior art reference itself, or from the nature of the problem to be solved." *SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1356 (Fed. Cir. 2000). We are left with no meaningful doubt about the Board's motivation finding and its basis.

Our conclusion is not undermined by the fact that the Board concentrated much of its attention on what could be combined. The Board explained that it was persuaded by WesternGeco's simple affirmative case for motivation, highlighting the key statement in Beasley itself, and therefore that it would focus its discussion on PGS's contrary arguments, which were substantially directed at combinability. *309 Final Decision*, 2016 WL 3193820, at *10-11. That discussion of why the Board was rejecting PGS's arguments against motivation does not undermine the motivation finding. Nor does it reflect a shifting of the burden of persuasion.

B

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PGS also argues that the Board did not properly consider the effect of smearing as a problem that would teach away from combining Beasley with Edington, undermining any finding of motivation to combine. *1366 PGS invokes the principle that the prior art must be considered "as a whole, including portions that would lead away from the invention in suit." *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987). We find no reversible error in the Board's rejection of PGS's smearing-based argument.

The Board found that the risk of smearing would not teach away from the combination of Beasley with the simple time-delay teaching of Edington to arrive at the claims at issue here. *309 Final Decision*, 2016 WL 3193820, at *14 (finding that "the smearing allegedly introduced by combining Edington's time delay encoding with Beasley's system would [not] have led an ordinarily skilled artisan away from that combination"). That finding was sufficiently supported in the record.

As discussed above, the Board found that Beasley's disclosure of near-simultaneous activation of energy sources includes some amount of time delay. And it is undisputed that some amount of smearing would occur when using Edington's time-delay encoding in the marine context where the seismic sources are continuously moving. *309 Final Decision*, 2016 WL 3193820, at *14. At the oral argument before the Board, PGS stated that "frankly, any time you have a time delay at all, there is spatial reflection point smearing." *Id.* PGS agreed that even the '981 patent "suffers it to some degree." *Id.* at *14 n.12. But neither party offered evidence as to the degree of smearing that could be tolerated in the marine context, where some amount of smearing is inevitable if timedelay encoding is used.

The Board found that "Beasley indicates that simultaneous (or near-simultaneous) activation of sources avoids the smearing that otherwise results when activating

the sources sequentially." *Id.* at *14. On that basis, the Board found that significant smearing could be avoided by using small time delays such that the firings were nearly simultaneous as contemplated by Beasley's concurrent-firing embodiment. *Id.* Small time delays are covered by the '981 patent claims at issue, so smearing could be avoided by making the combination at issue.

PGS argues that its expert Dr. Lynn provided undisputed testimony that combining Edington's method with Beasley "would result in an eight-fold loss of spatial resolution." PGS Br. 35-36. That argument relies on the presumption that one of ordinary skill would blindly incorporate Edington's exact methodology into Beasley. But the Board properly did not view WesternGeco's proposed combination to be so limited. *309 Final Decision*, 2016 WL 3193820, at *11 (stating that the "Petitioner's challenge relies on Edington for its teaching that time-delays can be used to encode and decode signals").

IV

For the foregoing reasons, we affirm the Board's final written decisions.

AFFIRMED

[1] Unless otherwise noted, general references to the Board's reasoning in its final written decision in IPR2015-00309 apply to all IPRs on appeal. *WesternGeco, L.L.C. v. PGS Geophysical AS*, IPR2015-00309, 2016 WL 3193820 (PTAB June 8, 2016) (*309 Final Decision*); see also *WesternGeco, L.L.C. v. PGS Geophysical AS*, IPR2015-00310, 2016 WL 3193821 (PTAB June 8, 2016) (*310 Final Decision*); *WesternGeco, L.L.C. v. PGS Geophysical AS*, IPR2015-00311, 2016 WL 3193823 (PTAB June 8, 2016) (*311 Final Decision*).

[2] <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial>.

[3] See *City of Arlington*, 569 U.S. at 297-98, 133 S.Ct. 1863 ("A court's power to decide a case is independent of whether its decision is correct, which is why even an erroneous judgment is entitled to res judicata effect. Put differently, a jurisdictionally proper but substantively incorrect judicial decision is not ultra vires. [¶] That is not so for agencies charged with administering congressional statutes. Both their power to act and how they are to act is authoritatively prescribed by Congress, so that when they act improperly, no less than when they act beyond their jurisdiction, what they do is ultra vires. Because the question — whether framed as an incorrect application of agency authority or an assertion of authority not conferred — is always whether the agency has gone beyond what Congress has permitted it to do, there is no principled basis for carving out some arbitrary subset of such claims as 'jurisdictional.'" (emphases added)).

[4] Because WesternGeco's petitions, PGS's patent owner responses, and the Board decisions in the three IPRs are materially the same for present purposes, we refer only to the papers in IPR2015-00309.