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guidance and risks, costs, and time associated with each.<sup>84</sup> The Department argues that “Xcel approached the application of TIL 1277 very differently from the way it approached the application of TIL 1121,” and its maintenance and inspection decisions were therefore “driven primarily by financial considerations.”<sup>85</sup> In addition, the Department goes on to argue that Xcel Energy “erred on the side of safety” when it applied “TIL 1277 to the tangential dovetail connections on its drum boilers [sic] units on its own initiative, without receiving any formal guidance from GE” but did not “take the same ‘err on the side of safety’ approach with respect to TIL 1121.”<sup>86</sup>

Directly contradicting the Department’s arguments is the actual industry guidance that existed prior to and then after the Event, which clearly reflects the different standards applied by and concerns understood in the industry between tangential attachments and finger-pinned attachments<sup>87</sup>:

- **TIL 1227 (issued pre-Event):** recommended time-based, phased array ultrasonic inspections of *tangential-entry* attachments (which can be performed with the blades still attached to the rotor). The

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<sup>84</sup> See, e.g., Ex. Xcel-6 at 7-12; Ex. Xcel-25 at 22-23, 26-27 (Sirois Rebuttal); Xcel Initial Br. at 90-92. Notably, Intervenors do not dispute that the turbine-blade-removal process (*i.e.*, Blades-Off inspection) is time-consuming, labor intensive, and expensive.

<sup>85</sup> DOC Initial Br. at 35.

<sup>86</sup> DOC Initial Br. at 36.

<sup>87</sup> In addition to the industry-known differences between stress corrosion cracking susceptibility concerns associated with finger-pinned and tangential attachments, there were additional industry-known differences about stress corrosion cracking susceptibility concerns between units with once-through boilers and units with drum boilers, such as Unit 3. It is undisputed that there is a much higher incidence of stress corrosion cracking in low-pressure turbines of units with once-through boilers when compared to those operating with drum boilers. See Xcel Initial Br. at 23-27.

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As an initial matter, the parties agree that bucket-lift checks are an acceptable means of inspecting *tangential entry wheel attachments* for distress or deformation at or near what is called the “notch opening,” which is the gap in the rotor wheel attachment for tangential blade attachments. As confirmed by Mr. Murray, it is a standard procedure to do bucket-lift checks on tangential-entry attachments.<sup>124</sup>

However, given the significant structural differences between tangential attachments and finger-pinned attachments<sup>125</sup>—differences that are utterly ignored by Intervenor—this inspection does not reveal the same information about finger-pinned attachments as tangential attachments. On the tangential attachment design, for example, if the rotor wheel started to deform, a “gap” or “lifting” could develop and be visually observed between the top outside edge of the rotor wheel and the very bottom and outside edge of the “notch block” or “notch blade” or the blades adjacent to the notch block or blade.<sup>126</sup>

As a result of the specific configuration of the tangential attachment and the distribution of load with the blades adjacent to the notch block or blade, deformation can occur that could create a gap or lift, which can be easily inspected (and measured) on tangentially loaded blades.<sup>127</sup> This can be seen in the following image of blades with

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<sup>124</sup> Ex. Xcel-46 at 1 (Murray Surrebuttal).

<sup>125</sup> Xcel Initial Br. at 17-23.

<sup>126</sup> Ex. Xcel-46 at 1-2 (Murray Surrebuttal). Notch blocks and notch blades essentially perform the same function: they are components that are inserted into the notch opening/gap in the rotor wheel attachment and lock everything together. Ex. Xcel-46 at 1-2 (Murray Surrebuttal).

<sup>127</sup> Ex. Xcel-46 at 1-2 (Murray Surrebuttal).

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information; the Department instead appears to be saying that, whatever the reality of 20 years of information, if the Company cannot provide contemporaneous documentation that it was at every second in compliance with every aspect of cycle chemistry guidance, it cannot meet its prudence obligations. That is simply not the inquiry.<sup>271</sup> To determine otherwise would upend decades, if not centuries, of jurisprudence.

Second, the Department has no reasonable basis to conclude that the Company provided insufficient data. Indeed, there is not a single Department witness who even *attempted* to review all of the available steam chemistry data in order to be able to conclude that what is available is somehow insufficient. As set forth above, the only witness who did review all of the available data—Mr. Daniels—concluded that it was sufficient to determine that the Company reasonably followed the available cycle chemistry guidance.<sup>272</sup> Moreover, Mr. Daniels noted that the Company’s 2005 inspection and the post-Event analysis failed to show material deposits or pitting, supporting the conclusion of the Root Cause Report that chemistry was not a significant causal factor behind the Event.<sup>273</sup> The Department has failed to credibly rebut that testimony.

**3. The Company’s Overall Chemistry Program Was Reasonable.**

The Department makes much ado about formal versus informal chemistry programs.<sup>274</sup> Once again, the Department is hyper-focused on a narrow issue—was the

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<sup>271</sup> See Section III.

<sup>272</sup> Ex. Xcel-53 at 2; Ex. Xcel-11 at 22, 25, 28 (Daniels Rebuttal); Ex. Xcel-9 at 31-32 (Daniels Direct).

<sup>273</sup> See Ex. Xcel-10 at 23 (Daniels Direct).

<sup>274</sup> DOC Initial Br. at 27-28.

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3 prior to the 2011 SCC LP turbine failure.”<sup>288</sup> Moreover, it is speculation that flies in the face of the Root Cause Report and of the objective *facts* that the Company’s inspection of Unit 3 and the post-Event analysis of Unit 3’s turbine components failed to show significant deposits or pitting that would have been present had steam chemistry been a significant causal factor behind the Event.<sup>289</sup> Fundamentally, as GE and industry experts acknowledge,<sup>290</sup> if the rotor design and operation generates sufficient stresses, the Event could have occurred with no detectable contamination at all.<sup>291</sup> Given the utter lack of support for the Department’s position, a “formal cycle chemistry review and improvement program” cannot be the standard for prudence here.

**V. THE INTERVENOR REFUND RECOMMENDATIONS LACK RECORD SUPPORT.**

Consistent with Intervenors’ approach to the pre-Event prudence analysis, the Department’s recommendation that the Commission require Xcel Energy to refund approximately \$55.68 million in replacement power costs,<sup>292</sup> with which the OAG apparently agrees,<sup>293</sup> is not supported by the record. First, Intervenors inappropriately dismiss the fact that the Commission removed Unit 3 from the Company’s rate base in the 2012 rate case, and for that reason alone, no refund should be required. Second, even were

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<sup>288</sup> Klotz Rebuttal, pp. 10-11.

<sup>289</sup> Ex. Xcel-10 at 23 (Daniels Direct); *see also* Ex. Xcel-53 at 3 (Daniels Surrebuttal); Evid. Hrg. Tr. Vol. 1 (Nov. 1, 2023) at 209 (Kolb).

<sup>290</sup> *E.g.*, Ex. Xcel-34 at 13-14 (Daniels Direct); Ex. Xcel-53, Sched. 1 & 2 (Daniels Surrebuttal); Ex. Xcel-26 at 16 (Tipton Direct).

<sup>291</sup> Ex. Xcel-53 at 2 (Daniels Surrebuttal).

<sup>292</sup> DOC Initial Br. at 40.

<sup>293</sup> *See* OAG Initial Br. at 6-7. As noted above, XLI argues for a higher refund amount, but does so with zero record support.

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rates included costs related to maintaining the plant.<sup>297</sup> With respect to Unit 3, since it was removed from rate base by the Commission, now also requiring a refund of replacement power costs would be duplicative and inappropriate, and the Intervenor recommendations should be denied.

**B. Intervenor Refund Recommendations Fail To Present the Full Picture of Any Customer Impact of the Event.**

Even if the Commission determines Xcel Energy was not prudent *and* that its lack of prudent action led to the Event, *and* that a *further* disallowance is necessary despite the prior removal of the unit from rate base and disallowance of direct costs, the Commission must still determine whether, considering the replacement power costs incurred, Xcel Energy’s customers paid more than they would have had the Event not occurred. If not, there is no basis to require a refund. This concept is ingrained in the process of determining replacement power costs, as all parties agree that, in order to estimate the replacement power costs, “reasonable assumptions” must first be made to “determine what [Xcel Energy’s] costs would have likely been had the outage not occurred.”<sup>298</sup> In other words, this analysis attempts to put customers in the position they would have been had the Event never happened.

The refund recommendations of the Department and OAG fail to consider this fundamental aspect of this inquiry as it applies to prior rate relief or to customer benefits.

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<sup>297</sup> *In the Matter of the Review of the July 2019-December 2019 Annual Automatic Adjustment Reports*, MPUC Docket No. E-999/AA-20-171, ORDER ADOPTING ADMINISTRATIVE LAW JUDGE REPORT AS MODIFIED AND REQUIRING REFUND (Feb. 25, 2022).

<sup>298</sup> Ex. Xcel-34 at 11 (Detmer Direct); Ex. DOC-4 at 8-9 (King Direct).