ATTACHMENT A

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Xcel Energy		Information Request No.	2
Docket No.:	E002/M-20-812		
Response To:	Interstate Renewable Energy Council		
Requestor:	Yochanan Zakai		
Date Received:	December 4, 2020		

Question:

A. How can a user identify which location the HCA values in Attachment C correspond to on the hosting capacity analysis (HCA) map or on Xcel's distribution system?

B. Why are the feeder names provided in Attachment B, the public queue, and on the HCA map (hereinafter "Xcel's Standard Feeder Names") different from the feeder names provided in Attachment C?

C. Please provide an Excel spreadsheet of Attachment C that replaces the feeder names with Xcel's Standard Feeder Names.

D. Does Xcel Energy plan to publish the spreadsheet referenced in request 2.C on its website?

Response:

A. As noted in our filing, the current iteration of the Hosting Capacity map does not include line segment IDs due to technical challenges. Specifically, the inclusion of section identification for each line segment would only be usable in a non-blurred Heat Map, which is currently a customer confidentiality and customer and grid security concern. Further, we are currently redacting certain feeders from the Heat Map for customer confidentiality and customer and grid security reasons, but in the spirit of wanting to provide as much information as responsibly possible from a security perspective, we are not redacting feeders from the Tabular Results. Therefore, providing a method to directly tie very granular segment information between these two HCA tools would compromise the security and confidentiality protections we have in place for the Heat Map. In light of these concerns, we are working with our Geospatial Information System (GIS) department to determine whether section IDs for the sub-feeder areas as currently shown in the Heat Map are able to be assigned.

B. The feeder names provided in Attachment C do correspond with the feeder names found in Attachment B and the HCA map. However, we can understand how it

may not be intuitive to tie these together. We explain here how they correlate – and, note that we will include this explanation in the updates we make to the HCA user guide (as further discussed in our response to IREC IR No. 9). Any difference in formatting is due to Attachment C being derived from the raw output of the DRIVE tool. In Attachment C, Feeder names are associated with the first segment of each feeder with a format similar to "FDRXXX_/#######" in spreadsheet column B. The first segment of each feeder is assigned a "0" value in column A of the spreadsheet. A user may sort by the 0s in column A and identify the feeder name and row number in which their desired feeder begins. Then, a user can simply unfilter column A and locate their desired feeder within the spreadsheet.

C. Please see our response to Part B above.

D. Please see our response to Part B above.

Preparer:	Luther Miller
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Date:	December 21, 2020

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Xcel Energy		Information Request No. 4
Docket No.:	E002/M-20-812	
Response To:	Interstate Renewable Energy Council	
Requestor:	Yochanan Zakai	
Date Received:	December 4, 2020	

Question:

A. Has Xcel Energy attempted provide criteria violation values through its map in the same way such results are provided on the HCA maps of NV Energy, San Diego Gas and Electric, Southern California Edison, or Pacific Gas and Electric?

B. The 2020 Hosting Capacity Analysis Report, Attachment A at 23 provides: "Each sub-feeder section of the HCA map can include many individual line segments. To implement this addition, line segments would need to be aggregated for each sub-feeder section of the HCA map. Such aggregation requires a methodology for determining what line segment should be displayed with an ID without cluttering the entire pop-up box." Xcel Energy's map displays HCA values and primary criteria violations at the sub-feeder level. Is there anything preventing Xcel from providing all the criteria violations using the same methodology by which Xcel Energy aggregates and displays the HCA values and primary criteria violations today?

Response:

A. While we are generally aware of other utilities' HCAs, we have not specifically assessed the presentation of criteria violations of the specific utilities noted in the question. To make our review of this information most meaningful, we would need to understand from stakeholders specifically what it is about how those utilities provide the criteria violation information that is particularly useful. We could then assess what it would take for the Company to present its criteria violation information in a manner that would achieve the desired functionality.

B. We are able to display all HCA values and primary criteria violations at the sub-feeder level, but do not do so due to concerns of readability/usability. If the

Commission determines there would be value in including all violations and HCA values within the heat map pop-up, we will make that change in our next HCA.

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Xcel Energy		Information Request No.	10
Docket No.:	E002/M-20-812		
Response To:	Interstate Renewable Energy Council		
Requestor:	Yochanan Zakai		
Date Received:	February 2, 2021		

Question:

Please provide a table, similar to the example below, comparing:

- all of the primary distribution system data that Xcel plans to field verify pursuant to existing asset management activities, including those identified in Staff Information Request No. 1,[1] and
- all of the primary distribution system data that Xcel argues is necessary to field verify to conduct more frequent hosting capacity analysis updates.[2]

This question does not pertain to field verification efforts on the secondary distribution system.

Primary Distribution System Data	Xcel Existing Field Verification	Xcel Proposed Hosting Capacity Analysis Field Verification
transformer capacity	yes	yes
location of transformer	yes	yes
etc.		

[1] MN Pub. Util. Commission Dkt. E002/M-20-812, Staff Information Request No. 1 (Jan. 6, 2021).
[2] MN Pub. Util. Commission Dkt. E002/M-20-812, Xcel Energy Hosting Capacity Analysis Report, Attachment F, at 9-12.

Response:

We provide the requested table as Attachment A to this response. We note that the Existing Field Verification column represents the current plan for additional data collection, validation, and testing of feeders that is part of our Advanced Distribution Management System (ADMS) initiative, as described in our January 25, 2021 Compliance Filing in Docket Nos. E002/M-19-666, E002/M-19-721, and E002/M-20-680 and noted in our response to MPUC-1 in this docket. The scope of the ADMS-driven initiative is more narrow than the conceptual comprehensive HCA initiative in terms of the Minnesota system data that would be completed. We further discuss below, our approach to the comprehensive field data collection initiative outlined in our HCA filing and how that correlates to our other/ongoing data validation efforts.

First, we clarify that the conceptual estimate we outlined for a comprehensive field data collection effort to support automation of the HCA to get it to a monthly cadence and to automate and/or integrate the HCA with various aspects of the interconnection process is just that – conceptual. We explained that should the Commission want us to pursue any of the potential HCA futures we outlined, it would be necessary for the Company to refine the relevant project cost and timing based on a more specific Use Case and scope, and propose the cost recovery treatment it believes is appropriate. This would include refinement of the data collection/ verification plan necessary to achieve the desired Use Case, which would take into account any overlapping data validation work that had since been completed or contemplated to be completed otherwise.

We think it is also helpful to understand the context of the conceptual estimate for the data collection and validation in the HCA filing. It is based on an estimate we had sought and received for a comprehensive field data validation effort for a subset of Minnesota feeders. We extrapolated that estimate to the entire Minnesota system and included costs for the back-office work, which is a final quality control check prior to updating this information in the system of record – GIS. We based the back-office adder on our experience with similar field validation efforts associated with our ADMS implementation in Minnesota and our Public Service Company of Colorado affiliate to-date.

After the Commission provides further direction, some of the items that we expect will impact the overall cost and timeline estimates will include:

- *Refined underground system data collection and validation.* The subset of feeders on which we based our overall estimate is largely overhead facilities, however, a portion of our Minnesota system is underground. We did not attempt to estimate the underground portions or differentiate the amount of work involved with data collection or validation of the underground parts of our system. We expect the costs and time to validate and/or collect data on the underground portion of our system will be higher than for the overhead parts. This expectation stems from the fact that a more skilled workforce would be necessary and visual inspection of overhead facilities is more straightforward and thus costs would be less than underground inspections.
- *Further data collection and validation that is completed.* In addition to our updated work practices that involve collecting additional details associated with new construction and reconstruction, we have a more narrow data validation effort underway associated with our ADMS initiative, as described in our January 25, 2020 compliance filing in Docket Nos. E002/M-19-666, E002/M-19-721, and E002/M-20-680 and MPUC Information Request No. 1 in this docket.
- *Efficiencies gained from our other overhead system data validation work.* We have already gained some efficiencies from the field data work we have done to-date, and

believe that we might be able to identify further efficiencies that will serve to reduce the overall cost of a comprehensive Minnesota field data initiative.

- *Efficiencies gained from Advanced Metering Infrastructure (AMI).* As a comprehensive field data effort will take several years to complete, our AMI implementation is nearing – and expected to start in early 2022. As noted in our HCA filing, we expect the data from AMI meters and Field Area Network (FAN) will provide additional opportunities for improvements to the data available for HCA.

In summary, depending on the timing of a Commission decision on the direction for the potential HCA futures we examined, a more refined data collection and validation estimate could vary greatly from the conceptual estimate contained in our filing.

Finally, we reiterate that highly accurate detailed distribution system data is critical to building system models and performing the complex engineering studies necessary to integrate DER on to the distribution grid and achieve other advanced grid capabilities. The historical field asset information utilities collected and maintained is not sufficient to meet the vision of automating the grid. Our approach to this to-date has been incremental – matching the costs with specific benefits, to keep costs low for our customers. A key question is how fast the Commission will want this advanced grid enabler to go.

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Xcel Energy Field Asset Data Collection and Validation Initiative Comparison
Primary System Data Elements

		Field Asset Data Effort	
Category	**Data Field**	**Existing / Ongoing (ADMS)***	**Conceptual HCA Futures (including for Monthly HCA cadence)**
Capacitor Rack	kvar rating	Yes	Yes
Capacitor Rack	phase designation	Yes	Yes
Capacitor Rack	oh ug	Yes	Yes
Capacitor Rack	Protection type	Yes	Yes
Capacitor Rack	connection	Yes	Yes
Capacitor Rack	Orientation	Yes	Yes
Capacitor Rack	Location	Yes	Yes
Capacitor Rack	facility tag x	Yes	No
Capacitor Rack	facility tag y	Yes	No
Capacitor Rack	company number	Yes	Yes
Capacitor Rack	voltage rating	No	Yes
Cogeneration	type	No	Yes
Cogeneration	Location	No	Yes
Fault Indicator	Location	No	Yes
Lot Centroid	LAND LOT CENTROID RELATIONS	No	Yes
OH ATO	Location	No	Yes
OH Fuse	field stencil	No	Yes
OH Fuse	type	No	Yes
OH Fuse	switch number	Yes	Yes
OH Fuse	Location	Yes	Yes
OH Fuse Unit	phase	Yes	Yes
OH Fuse Unit	normal position	Yes	Yes
OH Primary	Installed length	No	Yes
OH Primary	phase orientation	Yes	Yes
OH Primary	Route	Yes	Yes
OH Switch	field stencil	No	Yes
OH Switch	type	Yes	Yes
OH Switch	continuous amp rating	No	Yes
OH Switch	tie switch indicator	No	Yes
OH Switch	switch number	Yes	Yes
OH Switch	Location	Yes	Yes
OH Switch	normal position	Yes	No
OH Switch Unit	phase	Yes	Yes
OH Switch Unit	normal position	No	Yes
OH Transformer Bank	field stencil	No	Yes
OH Transformer Bank	bank configuration	No	Yes
OH Transformer Bank	facility tag x	No	Yes

		Field Asset Data Effort	
Category	**Data Field**	**Existing / Ongoing (ADMS)***	**Conceptual HCA Futures (including for Monthly HCA cadence)**
OH Transformer Bank	facility tag y	No	Yes
OH Transformer Bank	output voltage	No	Yes
OH Transformer Bank	secondary location	No	Yes
OH Transformer Bank	Location	Yes	Yes
OH Transformer Bank Unit	phase	Yes	Yes
OH Transformer Bank Unit	Protection type	No	Yes
OH Transformer Bank Unit	rated kva	Yes	Yes
Pole	framing type	No	Yes
Pole	Location	Yes	Yes
Primary Cable	phase	Yes	Yes
Primary Meter	company number	No	Yes
Primary Meter	facility tag x	No	Yes
Primary Meter	facility tag y	No	Yes
Primary Meter	Location	No	Yes
Primary Open Point	Location	No	Yes
Primary Wire	Size	Yes	Yes
Primary Wire	material	Yes	Yes
Primary Wire	insulation	No	Yes
Primary Wire	phase	Yes	Yes
Recloser Bank	company number	Yes	Yes
Recloser Bank	facility tag x	Yes	No
Recloser Bank	facility tag y	Yes	No
Recloser Bank	field stencil	Yes	Yes
Recloser Bank	rated voltage	Yes	Yes
Recloser Bank	max fault current rating	Yes	Yes
Recloser Bank	opening time	Yes	Yes
Recloser Bank	Location	Yes	Yes
Recloser Bank Unit	phase	Yes	Yes
Recloser Bank Unit	amp rating	Yes	Yes
Recloser Bank Unit	type	No	Yes
Recloser Bank Unit	curve	No	Yes
Regulator Bank	company number	Yes	Yes
Regulator Bank	facility tag x	Yes	No
Regulator Bank	facility tag y	Yes	No
Regulator Bank	Location	Yes	Yes
Regulator Bank Unit	phase	Yes	Yes
Regulator Bank Unit	kva rating	Yes	Yes
Regulator Bank Unit	amp rating	No	Yes
Sectionalizer Bank	company number	No	Yes
Sectionalizer Bank	Location	Yes	Yes
Sectionalizer Bank Unit	phase	Yes	Yes

		Field Asset Data Effort	
Category	**Data Field**	**Existing / Ongoing (ADMS)***	**Conceptual HCA Futures (including for Monthly HCA cadence)**
Step Transformer Bank	facility tag x	Yes	Yes
Step Transformer Bank	facility tag y	Yes	Yes
Step Transformer Bank	type	Yes	Yes
Step Transformer Bank	Location	Yes	Yes
Step Transformer Bank	Bank Configuration	No	No
Step Transformer Bank	size	No	Yes
Step Transformer Bank Unit	rated kva	Yes	Yes
Step Transformer Bank Unit	phase	Yes	Yes
Step Transformer Bank Unit	tap changer winding	Yes	Yes
Switching Facility	Company Number	No	Yes
Switching Facility	Location	No	Yes
Switching Facility	facility tag x	No	Yes
Switching Facility	facility tag y	No	Yes
Switching Facility	type	No	Yes
UG ATO	Location	No	Yes
UG Transformer	facility tag x	No	Yes
UG Transformer	facility tag y	No	Yes
UG Transformer	field stencil	No	Yes
UG Transformer	output voltage	No	Yes
UG Transformer	Location	No	Yes
UG Transformer Bank Unit	rated kva	No	Yes
UG Transformer Bank Unit	Phase	Yes	Yes
UG Transformer Bank Unit	protection type	No	Yes

* Note: *As noted in the narrative response to this Information Request, the scope of the ADMS-driven initiative is more narrow than the conceptual comprehensive HCA initiative in terms of the Minnesota system data that would be completed.*