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V. Appendix List

2 **Appendix 1: Eversource-Unitil response to OCA 1-001 with original DR attachment**

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**Public Service of New Hampshire d/b/a Eversource Energy
Unitil Energy Systems, Inc. and Northern Utilities, Inc. (together
Unitil)**

Docket No. DE 19-197

Date Request Received: 08/31/2020

Date of Response: 09/15/2020

Request No. OCA 1-001

Page 1 of 1

Request from: Office of Consumer Advocate

Witness: Jeremy Haynes, Justin Eisfeller, Christine Riley Hastings

Request:

Re page 6 lines 19-22, describing the utilities' "active participation" in the technical sessions held to date in this docket:

- a. Attached is a document circulated by the OCA in advance of the May 8, 2020 technical session, propounding to the Joint Utilities a series of questions on an informal basis. To date, no responses to these questions have been received. Therefore, please provide written responses to these questions, which appear in the attachment in red. OCA's informal written data requests to the utilities made in late April and early May as part of our responses to your questions. In particular, with reference to OCA's Master Use Cases, please provide alternative sequence diagrams for any of the use cases for which the utilities proposed "virtual" energy data platform would be part of the data flow and system integration model.
- b. With reference to OCA Use Case T-23 ("DER Deployment Tracking Dataset"), please provide a list of existing utility systems that processes or track DER Implementations today.

Response:

- a. Objection, this request is not relevant and is not reasonably calculated to lead to the production of admissible evidence in the proceeding. Except for the reference to participation in this docket's technical sessions, this request is not relevant to the Eversource/Unitil joint testimony and the questions in the OCA attachment do not pertain to Joint Utility participation in the docket or any of the technical sessions. Rather, as noted on the questions themselves, they are "somewhat random" and "based on questions and comments" provided previously. The OCA's questions ask the utilities to opine upon and engage to various degrees with the OCA's platform design premises and use cases, matters not covered in or relevant to the Joint Utility testimony. Furthermore, the Utilities object to the premise of the question that no responses have been provided. During the May 8, 2020 and May 28, 2020 sessions the Utilities noted that the informal questions had been reviewed and offered to verbally discuss the questions and provide comments during the technical sessions. The questions were discussed, and the OCA did not object to the provision of verbal responses during these discussions as satisfactory to furtherance of the docket.
- b. Unitil's internally developed, web-based application called the Generator Interconnection Database manages the lifecycle process of generator interconnections. This system tracks the location of the installation, customer and generator data, current operational statuses as well as the state of the interconnection application process.

For Eversource, in New Hampshire, DER Implementations are processed through the interconnection application process. Customers and/or vendors access an interconnection application form on the company website. The customer can submit a form by either electronic mail or postal mail. Upon receipt, the application is manually transferred to an internally developed Generation Interconnection Database. Customer application and interconnection study status is maintained in the database. After DER system installation, DER system data is maintained in the company's Generation Interconnection Database. Additionally, DER locational data is available for viewing in the company's Geographic Information System (GIS) software. Finally, customer accounts are updated in the Customer Information System (CIS) for appropriate billing treatment.

4/24/2020 DE 19-197 informal OCA Data Requests: Below in right hand column in red are OCA requests to utilities. These requests are somewhat random based on questions and comments (or lack of comments) provided by the utilities to OCA’s use case proposals filed on 4/6/2020 in DE 19-197. It is not an exhaustive list.

Completed	Use Case	
4/23/2020	Primary	<p>SB284 as a Platform</p> <p>NOTE: Includes OCA Data Request to IOU)</p> <p>Outside of security issue, do the utilities agree or disagree (any portions) with OCA Master Use case as described above? Pg4</p> <p>The OCA requests the IOUs to provide alternative sequence diagrams for any of the attached OCA use cases where “virtual” energy data platform would be part of the data flow and system integration model. Background: If the utilities are able to provide some level of technical information on the “virtual” energy data platform, this will facilitate OCA understanding of the virtual design. Technical discussions of any documentation provided by the utilities on virtual data sharing and systems design patterns will help lead to more informed discussions. Pg8</p>
4/23/2020	Primary	<p>SB284 as a Platform</p>
4/23/2020	CORE-01	<p>Billing dataset</p> <p>NOTE: Includes OCA Data Request to IOU)</p> <p>: Based on two years of technical analysis and outreach to experts within NH and nationally, we feel SB284 data platform, in its totality, is not redundant to any existing data sharing system in NH - including EDI. In order for the OCA to be able to evaluate EDI vs SB284 please provide:</p> <ul style="list-style-type: none"> - Documentation on EDI data model, governance of the EDI data model and the implementation of EDI at the utilities in NH, -Technical information how the EDI data model is implemented by each of the utilities. Indicate version and if all utilities use the same version of EDI -Technical information on EDI security and privacy model, -Technical information on the EDI Integration model and API that will support a certified Green Button platform including: Billing data, separation of PII and anonymous data, -Modified version of data elements table on bates 9 showing EDI

		<p>data elements as alternative to SB284 elements.}</p> <p>{OCA DATA REQUEST TO IOUs Part 2: Based on IOU’s statement that SB284 data seems redundant to EDI, please:</p> <p>- Prepare an “EDI” alternative sequence diagram to the sequence contained in OCA Use Case CORE 01 “Billing dataset” (reference bates 8) so as to illustrate EDI’s data and system integration capability,</p> <p>-Prepare an “EDI” alternate sequence diagram to the sequence diagram contained in OCA Use Case T-03 “Green Button dataset” (reference bates 33) illustrating how EDI would provide a dataset (step 3e), where that dataset contains billing data consistent with OpenESPI standard used by certified Green Button platform.</p> <p>-Reference Table 1 “Use Case” at bates 3 and please identify all OCA use cases, (other than CORE 01 and T03) where EDI can be used as an alternative to SB284. For these use cases please provide alternative “EDI” sequence diagram(s) illustrating the data and system flow required to enable the use case. Include TOU scenario.</p>
4/23/2020	CORE-02	<p>TOU dataset</p> <p>NOTE: Includes OCA Data Request to IOU)</p> <p>Please discuss each utility’s current capability to provide interval data TOU datasets for all customer classes, to external third party such as a CCA, PUC, Research organization. Please describe the process. NOTE: This is not asking what the utilities technical ability is to collect granular interval data.</p>
4/23/2020	CORE-03	Demand Study dataset
4/23/2020	CORE-04	Multi-Utility /Multi State dataset
4/23/2020	CORE-05	Multi Fuel – Electric usage + Gas usage dataset
4/23/2020	CORE-06	Statewide Index
4/23/2020	T-03	<p>Green Button dataset</p> <p>NOTE: Includes OCA Data Request to IOU</p> <p>Please comment on this description of a Green Button implementation.</p>
4/23/2020 modified 5/4	T-04	Community Dashboard Integration dataset
4/23/2020	T-09	Customer Data + System Data Integration dataset

Modified 5/4		
5/4/2020	T-14	CCA – Community with 3 utilities dataset NOTE: Includes OCA Data Request to IOU) Do the utilities agree or disagree (any portions) with the CCA case as described above? Pg75
5/4/2020	T-23	DER Deployment Tracking dataset NOTE: Includes OCA Data Request to IOU) Regarding “Would this replace existing systems or processes” Please provide a list of utility existing systems or processes that track DER Implementations today. Pg 82
5/4/2020	T-10.1	Integration dataset of Utility energy data + non-utility energy data
5/4/2020	T-32	Weatherization Assistance Program platform dataset

Jim Brennan

6/8/2020

**Public Service of New Hampshire d/b/a Eversource Energy
Unitil Energy Systems, Inc. and Northern Utilities, Inc. (together
Unitil)**

Docket No. DE 19-197

Date Request Received: 08/31/2020

Request No. OCA 1-007

Request from: Office of Consumer Advocate

Date of Response: 09/15/2020

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Witness: Christine Riley Hastings, Jeremy Haynes

Request:

Re p 12, lines 4-13, discussing California's Green Button data sharing model:

- a. Do you agree it is a decentralized (utility by utility) model, and not a centralized model?
- b. Are you aware of any data issues relative to the California IOUs' Green Button Platforms? If so please discuss and explain how the New Hampshire utilities' proposals would avoid such problems.

Response:

- a. A decentralized model does not imply utility by utility. Utility by utility means that each utility is doing something different. Decentralized means that the data is not all being stored in a centralized location. The California utilities helped initiate the Green Button Alliance and each uses the Energy Service Provider Interface (ESPI) data standard released and maintained by the North American Energy Standards Board (NAESB) as a core component of their Green Button implementation to provide data to third-parties via secure and standard APIs. However, even though each of the California utilities have the same data exchange protocol, they have different implementations. A DER provider in California considers Pacific Gas and Electric (PG&E) to be the most advanced implementation, then Southern California Edison (SCE), while San Diego Gas and Electric (SDG&E) had the most limited resources and a basic implementation. As discussed in the Eversource/Unitil testimony on page 18, line 14, the Utilities believe that a modular, and primarily decentralized, design will allow for maximum cost/benefit justified flexibility while minimizing many of the data security, privacy, and governance complexities and risks which come from a centralized database. However, as also discussed in the Eversource/Unitil testimony, on page 27, line 2, in the Option 2 model being proposed, the interface for these APIs, as well as the data formats returned will be exactly the same for each implementing utility and will provide standard interfaces for on-demand or scheduled energy data transfers to external requestors. Even though the back-end logic for extracting and transforming the data for each utility will be unique, the APIs will be programmed against the logical data model abstraction, ensuring simple combination of multiple Utility data sets irrespective of underlying differences in data storage, nomenclature and processing.
- b. We are not aware of any data issues relative to the California IOUs' Green Button initiative. As discussed in part a, while each of the California Utilities have the same data exchange protocol, they have different implementations. In Options 2 and 3, the New Hampshire Utilities have

proposed that the interface for the APIs, as well as the data formats returned will be exactly the same for each implementing utility avoiding the issue of different implementations in California.

**Public Service of New Hampshire d/b/a Eversource Energy
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Unitil)**

Docket No. DE 19-197

Date Request Received: 08/31/2020

Request No. OCA 1-024

Request from: Office of Consumer Advocate

Date of Response: 09/15/2020

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Witness: Jeremy Haynes, Dennis E. Moore

Request:

Re page 29, line 17-19: Regarding the utilities having designed the platform to allow for an “aggregation endpoint” or “API of APIs:”

- a. Have the utilities designed such a model that is being used today?
- b. How mature is this design?
- c. Has the design been tested? If so please discuss.
- d. Does an “API of APIs” design currently exist and in use in other states to achieve a single endpoint for accessing all utility data from multiple utilities? If so, please provide details.

Response:

- a. Unitil and Eversource do not have a model that precisely matches the strawman proposal in production use today, however we have designed and developed numerous production APIs including APIs that directly consume other APIs (a model similar to what is being proposed for the data platform).
- b. See answer to “a” above.
- c. The proposed design is a strawman and has not been implemented or tested.
- d. We are unaware of any other states that have implemented a model that precisely matches the strawman proposal, however there are numerous examples of utilities sharing data via APIs.

**Public Service of New Hampshire d/b/a Eversource Energy
Docket No. DE 19-197**

Date Request Received: 09/25/2020

Request No. OCA 2-001

Request from: Office of Consumer Advocate

Date of Response: 10/02/2020

Page 1 of 2

Witness: Christina S. Jamharian, Jeremy Haynes

Request:

Reference Eversource & Unitil response to OCA 1-021 regarding Option 3 API of API “pre-assembly.”

- (a) Please explain why pre-assembly is needed and what problem it solves. Please provide information on the end-to-end data flow occurring during preassembly including:
- (b) Data in motion (i.e. data in transit, data in messages, and data in processing),
- (c) Data at rest (i.e. data within a structured filing system, database etc.),
- (d) In the case that (c) exists (i.e. data at rest in a database or file), please indicate: (1) is this an existing or a new database or file? (2) what is the data design (data model) of this database or file?, (3) What is the purpose (function) of the database or file? And (4) What data standard would be used to define the database or file?,
- (e) In the case that (c) exists (i.e. data at rest in a database or file), please indicate (1) approximately how many databases are required, and (2) the extent to which the database / files structures be consistent across all the utilities?
- (f) How will you test the API of API pre-assembly process? Please describe the test environment, centralized or decentralized (utility by utility).
- (g) Please discuss how controlled regression testing will be performed in the API of API pre-assembly process. In the API of API model, what typical events would trigger the need to perform regression testing?

Response:

There are two levels where pre-assembly of data may occur within the Option 3 proposal. At the utility level, each participating company will expose their own secure API aggregation endpoints implemented to a mutually agreed upon standard. There may be some type of API certification process applied to the utility implementation to assert that their API complies with the common utility standard. These utility endpoints will perform any necessary data aggregation (for example, by town) for that utilities' customer base. For example, a consumer could request a Unitil only data file, aggregated by town, by calling Unitil's aggregation endpoint. This data would be returned in the same (to be determined) file/record format for **all** participating utilities.

The API of APIs will also perform an additional level of “pre-assembly” or aggregation of data across all participating utilities. For example, a consumer could call the API of APIs and get a multi-utility data file, aggregated by town in the same format described in the previous example. The mechanics of this involve the API of APIs calling each of the utility secure aggregation APIs (described in the previous paragraph) and combining the data into a single common output.

The implementation mechanics of the pre-assembly have not yet been designed or specified, but it is reasonable to expect that there will be some **temporary** storage of the utility data sets that require assembly. This data would persist only for the time necessary to perform any required transformations (note, that the potential exists for these transformations to be performed using non persistent storage, but the large data volumes will likely make some sort of temporary caching more performance friendly). The physical storage of any temporarily cached data sets could be in secure file storage (in JSON or XML format) or in a simple transient database table.

All pre-assembled file structures transmitted by the APIs will be consistent across all participating utilities.

The test environment architecture is still to be determined, but the utilities expect that it will be comprised of industry standard development, staging and production environments and data sandboxes. The test cases will need to be rigorously defined but cannot be developed until final requirements for the platform are in place. The test environments will likely include representative data from all participating utilities.

Test automation, if considered to be cost/benefit prudent, would likely assist with this process by introducing levels of repeatability and efficiency that are difficult to achieve with purely manual testing. Once the test scripts are defined for the platform components, those scripts should become controlled documents subject to change review and governance procedures.

There are likely a wide variety of potential scenarios that would necessitate the execution of a platform regression test. The decision regarding the best places to implement these triggers and how broadly to implement them must ultimately be guided by a risk-based cost/benefit analysis. Changes made to the utility API implementation, changes to the data standards, the addition of new functionality, and material changes to the API of APIs are all examples of triggers that might necessitate a regression test.

Electric and Gas Utilities
Docket No. DE 19-197
Development of a Statewide Multi-Use Online Energy Data Platform
Office of the Consumer Advocate (OCA)
Set 1 Data Requests

Received: 9/25/2020

Date of Response: 10/08/2020

Request Number: OCA 1-3

Witness: Stephen Eckberg & Jason Morse

Request:

Regarding Staff testimony Bates page 6 line 3, discussing a proposed two-phase approach to determine reasonable cost and public interest. Regarding the first phase (threshold issues):

- a) Please indicate if the following decision represents a threshold issue: determination to build either a (1) virtual platform API of API with decentralized data back ends, or (2) a centralized platform and API with a centralized database. Please explain.
- b) If the answer to (a) is yes, please identify precisely where in the procedural schedule this threshold issue will be resolved and a decision made, explain whether an evidentiary hearing and/or briefing would be necessary prior to such a decision, and describe what procedural steps Staff envisions the Commission taking so as to give the parties adequate notice that this is, in fact, the approach to the docket the Commission has adopted..
- c) If the answer to (a) is no, does that mean the recommendation or decision relative to this threshold issue will be made by the vendor(s) during / following the RFP process (the second phase) once the contracts are awarded?
- d) Other than “party testimony . . . inform[ing] the Commission” what other possible evidence or information would be helpful in informing the Commission?

Response:

- a) It is not clear whether the Commission would interpret the data platform law to provide a requirement or guidance on how to design the platform architecture. It is therefore not clear that a “virtual platform API of API with decentralized data back ends” or “a centralized platform and API with a centralized database” are the only two choices for creating a data platform that meets the requirements of the data platform law. The determination of whether one of these choices should be built, and potentially a determination of which one of these choices should be selected does appear likely to impact multiple other decisions regarding the platform’s specifications, as well as its overall cost. It therefore appears likely that this should be considered a threshold issue within the context of Staff’s testimony.

- b) In its testimony, Staff provides the Commission with a suggestion of one possible method for estimating the costs of the platform using a “two-phase” approach. The Commission-approved procedural schedule in this docket includes a hearing on February 3, 2021. If there were consensus among the parties that the approach suggested by Staff is appropriate, one approach would be for the parties could request Commission decision on any non-consensus first-phase threshold issues — or relatedly, approval of any first phase threshold issues on which there are consensus — based on the testimony presented at that hearing.
- c) See Staff Response to OCA 1-3(a)
- d) The Commission generally makes findings and determinations based on the record of the proceeding, though on occasion the Commission takes administrative notice of facts outside of the proceeding.