

- Not-Public Document – Not For Public Disclosure
- Public Document – Not-Public Data Has Been Excised
- Public Document

Xcel Energy Data Request No. 1-3
Docket No.: EL23-032
Response To: South Dakota Public Utilities Commission
Requestor: Joseph Rezac
Date Received: December 5, 2023

Question:

How will Xcel achieve a 60% or 80% reduction during a load control event? Will this be achieved by cycling off 60% of the minuets during any given hour? What sort of cycling timeframes is Xcel looking at to achieve is targeted reductions? Is there any maximum amount a time a customer can be cycled off during a load event?

Response:

The Company has deployed two types of Saver’s Switches– Standard and Smart Switches. The two have specific operational requirements.

Standard Switches

These switches were deployed from the inception of the program around 1990 through 2004. A standard switch uses a time-based cycling strategy to reduce AC unit load. To achieve a 50% load reduction, it cycles a switch in 15-minute durations (i.e. 15 minutes off / 15 minutes on). Adjusting to a 60% cycling strategy would mean adjusting the cycling to 18 minutes off / 12 minutes on. An 80% reduction in a systems emergency would cycle at 24 minutes off / 6 minutes on.

The majority of the currently installed base of Saver’s Switches are Standard Switches. The limitation to a Standard Switch is due to AC unit oversizing. An oversized AC unit would not run 100% of the time during a peak. In a strictly time-based cycling scenario, the load reduction would be less than intended. For example, if a customer’s AC unit runs 50 minutes out of the hour at a peak, a 15 minutes off / 15 minutes on cycling strategy would only yield a 40% reduction in load (i.e., the AC unit goes from running 50 minutes per hour to 30 minutes). To help achieve the targeted load reduction, the company worked with the switch manufacturer to develop a ‘smarter’ switch.

Smart Switches

Smart Switches were deployed starting in 2004. The Smart Switches contain an adaptive algorithm that adjusts the cycling based on AC unit run-times prior to the control event. In the previous example, a smart switch would recognize the 50-minute peak run time and achieve a 50% cycling by adjusting the cycle times to 17.5 minutes off / 12.5 minutes on. Increasing the cycling percentage would reduce the AC unit run times. The run time would not go below 24 minutes off / 6 minutes on.

In recent history, control events have normally lasted for 2-4 hours. There is no set limit to how long a control event could last. But from a practical standpoint, the program only generates load relief above certain temperatures when AC units are running. The Company is also keenly aware that participation in the program is voluntary. Cycling too long would likely lead to program attrition. In recent years annual attrition has been quite low. It is crucial to the viability of the program to maintain a low level of attrition.

Preparer: Patrik Ronnings
Title: Sr Product Portfolio Manager
Department: Demand Management
Telephone: 612.330.5787
Date: December 14, 2023