

OTTER TAIL POWER COMPANY  
Docket No. EL13-015

Response to: South Dakota Public Utilities Commission  
Analyst: SDPUC Staff  
Date Received: 5/20/2013  
Date Due: 5/30/2013  
Date of Response: 06/04/2013  
Responding Witness: Kim Pederson, Manager Market Planning - (218) 739-8303

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Information Request No: SD-PUC-01-10

Increased cycling of mechanical components can reduce equipment life and increase maintenance expenses. Does the benefit/cost tests for the Air Conditioning Control program include those types of costs?

**RESPONSE:**

The benefit/cost calculations do not include any costs associated with reduced equipment life or an increase in maintenance expense because none are expected. For each program Otter Tail uses an equipment life that has also been approved in other state jurisdictions and typically accepted in other state's Technical Reference Manuals.

Otter Tail has researched the issue of impact on equipment associated with air conditioning cycling. Air conditioning cycling programs have been around for decades and utilities have substantiated that equipment damage associated with air conditioning cycling is unfounded.

In order to further substantiate this assumption, Otter Tail consulted with a third party on the topic. Mr. Bryan Jungers, Manager of Research at E-Source, a nationally-recognized energy, technology and research agency, confirmed the following on January 18, 2013 through email to Otter Tail:

*“The concern over damage to air conditioning (AC) units is often related to what is referred to as “short cycling” of the compressor, or turning the compressor off and then back on again too quickly. Typically, short cycling refers to a compressor off-time of less than 15 minutes; since an off-time of 15 minutes is within the range of normal compressor cycling operation, it should not cause any excessive damage to the AC unit. Our past research has shown that the vast majority of residential air conditioner manufacturers incorporate some kind of control circuit that protects the compressor from short cycling. Given that, whatever controls the specific air conditioner manufacturer has in place to protect the system against short cycling caused by the thermostat should also act*

*to protect against short cycling due to load control interruptions. We wouldn't expect DR cycling of 15 minutes on, 15 minutes off to reduce the useful life of the AC compressor, since residential air conditioners are designed to cycle on and off thousands of times per cooling season. The number of additional cycles resulting from load control seems trivial by comparison and should have no adverse impact on the useful life of the AC unit."*

Otter Tail's Air Conditioning Control program cycles the unit at 15 minute intervals. We believe that our cycling program has no adverse impact on the AC unit.