

**BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION**

**IN THE MATTER OF IDAHO POWER'S )  
APPLICATION FOR AUTHORITY TO ) CASE NO. IPC-E-02-13  
IMPLEMENT A RESIDENTIAL AIR )  
CONDITIONER CYCLING PILOT )  
PROGRAM AND TARIFF SCHEDULE 81. ) ORDER NO. 29207  
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On December 23, 2002, Idaho Power Company filed an Application (Application) seeking authority to institute a Residential Air Conditioner Cycling Pilot Program (AC Pilot Program or Program) and implement proposed tariff Schedule 81. In Idaho Power's 2002 Integrated Resource Plan (IRP), the Company identified peak resource deficiencies facing its system in upcoming years. To address those deficiencies, Idaho Power's IRP suggested targeting demand-side measures that reduce peak-hour demand. The voluntary Program would enable Idaho Power to begin testing summer peak-load reduction by directly controlling residential air conditioning load. This could potentially decrease Idaho Power's overall energy costs, which would in turn result in savings for all customers. Interested parties filed comments on or before February 21, 2003 and Idaho Power submitted reply comments on February 28, 2003. In this Order, the Commission approves implementation of the proposed AC Pilot Program and directs Idaho Power to raise the customer participation incentive from \$5 to \$10 per month.

**THE PROGRAM**

In exchange for an intelligent programmable thermostat installed in their homes and a \$5 monthly monetary incentive, participating customers would voluntarily permit the Company to cycle their central air conditioners. Idaho Power would cycle the air conditioners up to four hours per day between the hours of 1:00 p.m. and 9:00 p.m. for no more than 10 weekdays per month in June, July and August. Application at 3. Limited to 200 Boise and Meridian homeowners in the first year and 500 in the second, the two-year Program would expire on September 30, 2004. *Id.* at 4.

Each participant would be allowed to temporarily "opt out" of the Program for one day each month after providing Idaho Power with notification by 4:00 p.m. the preceding day. If a customer notifies the Company that he/she wishes to cease participating in the Program

altogether before completing an entire Air Conditioning Season (June, July, and August), the customer may terminate participation and either return the thermostat in working condition to the Company within a certain period of time or be charged \$100 for the thermostat. *Id.* There would be no penalty for terminating participation if a customer satisfactorily took part in a minimum of one complete Air Conditioning Season.

The Application indicated that the Energy Efficiency Advisory Group (“EEAG”) has concurred with the Company’s proposal to use Energy Efficiency Rider funds, collected under Idaho Power Schedule 91, to finance the AC Cycling Pilot Program. *Id.* at 5. The cost of the Program would be approximately \$410,000 per year for each of the two Program years. *Id.* Although the AC Cycling Pilot Program may result in reduced revenues for Idaho Power, the Company’s Application indicated that it would not request recovery of the reduced revenue. *Id.*

The Application indicated that other electricity providers have reported load reductions of approximately two-kilowatts per household with similar air conditioner cycling programs. *Id.* Because half of the participant houses will be cycled at any one time, this number would translate into one-kilowatt load reduction per participant. Idaho Power stated that it hopes to achieve a 200-kilowatt load reduction per cycling episode the first year and a 500-kilowatt load reduction the second year with full participation. *Id.*

According to the Company, the goal of the AC Cycling Pilot Program is to assess the effectiveness of air conditioning thermostat control in reducing peak load. Idaho Power would also assess customer participation, volunteerism, satisfaction and retention. Furthermore, Idaho Power would gain operating experience in management of the Program itself, test the chosen equipment, and evaluate different marketing strategies. Idaho Power’s Application stated that the Company will include the results of the AC Cycling Program in the annual report to the Commission detailing the EEAG’s activities. *Id.* at 6. This report will include the Company’s response to EEAG recommendations, the associated Program costs, demand-side management (DSM) accounting numbers and customer response data.

#### **PUBLIC COMMENTS**

The Commission received five comments from Idaho Power ratepayers regarding the Company’s Application. A Meridian resident noted that he participated in a similar program in North Carolina and found the equipment to be “almost unnoticeable.” Moreover, the monthly credit was “worth whatever inconvenience the irregularity of air conditioning may have caused.”

The other four public comments opposed approval of the AC Cycling Pilot Program. One commentator did not believe Idaho Power should be allowed to regulate residential air conditioning because “the government already controls enough of our lives.” She also stated that a \$5 monthly incentive is not enough to warrant the “discomfort and foul moods” of those living in participating households. A second Meridian resident thought the proposal was “a horrific idea” and threatened to install a generator rather than continue as an Idaho Power customer if the pilot was implemented system-wide.

A commentator from Boise argued that the proposed AC Pilot Program proposal is unnecessary and expensive given that models can effectively predict the success of the proposed direct load control program for a small fraction of the cost of an actual pilot program. This commentator also indicated that the monetary incentive should be based on unit tonnage to recognize the relative contribution of different sized units to load reduction.

Finally, an Idaho Power ratepayer from Kuna was concerned that the Program might extend beyond two years without Commission approval, lack independent oversight over the customer selection process, and be unduly expensive. This commentator also noted that the proposal was unclear about a number of topics, including assessment of the Program’s effectiveness and Company access to participants’ homes.

#### **NW ENERGY COALITION et al COMMENTS**

The NW Energy Coalition, Idaho Rivers United, and Advocates for the West (referred to collectively as the “NW Energy Coalition”) questioned the need for an AC Pilot Program given that AC cycling programs have been implemented around the country for decades. NW Energy Coalition Comments at 2. However, the NW Energy Coalition largely supported the Company’s proposed Program as a more simple, direct and manageable approach to load management than time-of-use metering. However, they requested two modifications to Idaho Power’s proposed Program.

First, the NW Energy Coalition requested the Commission increase the financial incentive offered to customers. While recognizing that a higher incentive may marginally decrease the Program’s cost-effectiveness, it also will result in broader Program appeal. Of the proposed \$410,000 annual Program budget, only \$3,000 would be spent on financial incentives to customers in the first year and \$7,500 in the second year, assuming the Program is

implemented as proposed. *Id.* An incentive of \$8 to \$10 would only marginally increase Program costs, but would undoubtedly result in a more enthusiastic customer response.

The NW Energy Coalition also requested the Program be expanded to seek participation of 500 customers in the first year with an additional 1,000 customers by the end of the second year. *Id.* This approach would admittedly increase Program costs, but broader participation will likely increase cost-effectiveness, peak-shaving, and financial benefits for all Idaho Power customers. The NW Energy Coalition also noted that Idaho Power has not fully allocated funds available under the Company's DSM tariff rider, and thus an expanded Program should fall within the Company's DSM budget. *Id.*

### STAFF COMMENTS

Staff generally supported the Company's Application as a method to achieve peak-hour demand reductions. In short, Staff recommended approval of the Company's Application with Program modifications that include utilizing all three AC cycling options, two control groups, and an AC maintenance control group. According to Staff, this would provide a full spectrum of data and allow the Company and the Commission to determine which AC Program variation is the most energy efficient and acceptable to customers.

**Evaluate All Options:** Staff believes that all three options listed in the Company's proposed tariff (i.e., cycling the AC unit for a specified length of time, cycling the AC unit until specified temperature change is attained, and changing the temperature set point) should be tested and evaluated. If the Company believes it can implement and evaluate only one of those options, Staff identified the thermostat adjustment is the best single option because the other options may result in temperatures that are too hot for some participants. Staff Comments at 2-3.

**Effects on Compressor Life:** Staff was concerned about the possible detrimental effect of cycling air conditioners on the life of the AC compressor. While Staff believes the potential incremental effects from the Program may be small due to the limited hours of cycling proposed, Staff cannot dismiss the likelihood that some of Idaho Power's proposed Program options will accelerate wear on air conditioners – especially AC units that are sized correctly, i.e., sized to run at optimum efficiency rather than sized to compensate for inadequate building envelopes and/or poor ductwork. *Id.* at 4-5. Staff believes the option of adjusting the thermostat's temperature set point will not have this effect because it will not cause compressors to cycle more frequently. Thus, Staff believes it would be prudent for Idaho Power to advise its

Program participants of DOE's findings regarding the detrimental effects of frequent cycling on compressor longevity and efficiency, and the reasons why the Company does not believe that this should cause concern. *Id.* at 5.

**Evaluate Effects of Advanced Thermostat:** Staff is also concerned that the Company does not intend to evaluate the thermostats' effects on either energy consumption or demand, instead focusing only on the effects of the AC cycling. *Id.* at 5. If so, the Company would miss an opportunity to evaluate the effects of such thermostats and be unable to isolate the effects of the thermostats from the AC cycling effects. Staff believes that assessing the effects of the programmable thermostats is important and could be achieved through the analysis of the load profiles of customers in a control group.

**Need for Pilot Program:** Staff agreed that the climate, housing, topographic and demographic characteristics in Idaho Power's service area combined with its relatively low electricity rates warrant a pilot program. *Id.* at 6. However, Staff was concerned that Idaho Power does not plan to include a control group in its evaluation, instead evaluating Program effectiveness by comparing average load profiles of the participants on cycling days with the average load profiles of the participants on similar non-cycling days. Staff noted that days with similar cooling degree days are not necessarily similar in other important ways, such as cloud cover, humidity, wind speed and direction, hours of daylight and solar angle and intensity. *Id.* A control group would help explain the variability between so-called similar days and determine the extent to which the volunteers' electricity usage is influenced by the fact that they are part of a test.

**Additional Air Conditioning Program Options:** Staff stated that monitoring the energy use of two control groups, one with the advanced thermostats and one without, would provide valuable data necessary to evaluate the success of this Program. *Id.* Programs that promote the proper sizing, installation, and maintenance of air conditioners and ducts could also reduce summer peak and overall energy use. Staff also suggested that the Company and its EEAG consider a program that promotes the use of evaporative coolers, which cost half as much and use one-quarter the energy required by air conditioners. *Id.* at 7.

**Importance of Reporting:** Although information gathering is the primary goal of a pilot Program, Staff noted that it has still not received a full report for the Company's 1999 Idaho City automated meter reading trial. *Id.* Absent a report containing detailed evaluation of the

effects of the proposed AC cycling options and a comparison to appropriate control groups, the Commission may have difficulty finding that the costs of this AC Pilot Program were prudently incurred given that the program did not meet its informational objectives.

**Costs of Customer Incentives and Program Promotion and Recruitment:** The Company's estimated \$810,220 budget for this 2-year AC Pilot Program contains \$200,000 for promotion and an unspecified amount for recruitment, but allocates only \$10,500 for customer incentives. Staff believes that tripling of the budget for customer incentives (i.e., \$15 per month instead of \$5 per month) would reduce the budget requirements for recruitment and promotion to a more reasonable level. *Id.* at 8. If the Company were to spend an additional \$21,000 on incentives to make the Program more attractive to customers, it would likely save a couple hundred thousand dollars on promotion and recruitment. Some of the savings from reduced promotion and recruitment costs could be spent on monitoring control groups and more comprehensive Program evaluation.

#### **IDAHO POWER REPLY COMMENTS**

Idaho Power submitted reply comments to address assertions made by Staff and the NW Energy Coalition in reference to the AC Pilot Program. As a point of clarification, the Company noted that although Staff referred to the meters used in the Program as time-of-use meters, the Company intends to use a mass memory meter capable of recording and storing interval load data and monthly kilowatt-hour data for billing purposes. Reply Comments at 2.

**Proposed Cycling Options:** Idaho Power recently selected a vendor to provide thermostats and provide support for this Program. The vendor's representatives recommend that because of Idaho's hot dry climate, the cycling option that will likely be the most successful would be a 50 percent cycling routine (cycling for a specified length of time on a percentage basis). *Id.* at 3. This routine would turn off a customer's AC compressor 15 minutes out of every 30 minutes during a cycling event.

The thermostat purveyors and other utilities reported that the temperature set point routine preferred by Staff is a less effective cycling routine for reducing peak load over a set period of hours. Under this cycling routine, the electrical load is immediately reduced but load reduction decreases gradually as the cycling event progresses. Idaho Power does not discount this option given the need to balance customer comfort and load reduction. However, the Company argued that it should not be limited to exploring strategies that have been shown to be

less optimal elsewhere or to ignore new system capabilities that have the potential to increase load reduction and/or improve participant comfort. *Id.*

**Effects on AC Compressor Life:** Contrary to Staff’s contentions, the Company stated that it does not dismiss concerns that frequent cycling will have a detrimental effect on AC compressor life. Instead, Idaho Power drew different conclusions from the DOE “Energy-Efficient Air Conditioning” report and other evidence concerning premature wear on AC compressors gathered by the Company. Idaho Power pointed out that the DOE report emphasized the sizing of AC units and did not address load control cycling. *Id.* at 4. In fact, the report affirmed that if a customer’s AC compressor is oversized, it will “over cycle” whether the customer is a participant in the AC Pilot Program or not. Thus load control cycling would not be detrimental, but oversizing would be. If a 50 percent cycling routine is used, the AC compressor will turn off only twice per hour. According to the Company, this operation is well within the industry guidelines. *Id.*

Although Staff suggested Idaho Power provide each Program participant with a copy of the DOE Energy Efficient Air Conditioning Report and ARI Guideline A, Idaho Power believes this would imply that the Company has concerns with the proposed Program when, in fact, it has no such concerns. Idaho Power stated that it would not choose to implement this Program if the Company believed the Program could cause damage to a customer’s air conditioner compressor. *Id.* at 5. The Company noted that other utilities operating air conditioner cycling programs in the United States report that damage to air conditioning units has not been a problem, despite the fact that these programs have been in operation for over 20 years.

The Company also disagreed with Staff’s assertion that “the option of adjusting the thermostat’s temperature set-point will not have this effect because it will not cause compressors to cycle more frequently.” At a 50 percent cycle, a customer’s AC compressor will be turned off twice an hour, which is within normal industry standards. By changing the temperature set point, the Company has no idea how many cycling events would occur. Idaho Power stated that this would only add uncertainty to the Program. *Id.* at 6.

**Evaluate Effects of Programmable Thermostats:** The Company emphasized that the primary goal of this AC Pilot Program is to reduce summer peak loads by cycling residential customers’ AC compressors – not to evaluate the effects of programmable thermostats on either

energy consumption or average demand. When the Company stated that these thermostats “may reduce overall energy use,” it was identifying a possible secondary potential benefit of the Program. *Id.* Although participants may obtain some energy savings from these sophisticated thermostats attributable to reduced winter heating costs, the Company has no ability or desire to monitor the reduced use of fuels other than electricity.

**Reporting and Suggested Program Modifications:** The Company agreed with Staff that information gathering is the primary goal of a pilot program. However, the Company believes that the information gathered, analyzed and reported in a pilot program should be directed at the viability of the pilot program’s objectives and scope. Adding participants, testing more and different demand side management programs, or enlarging the scope of this pilot could delay the deployment of this Program and analysis of the data collected. The Company also believes that increasing Program incentives and adding multiple control groups would add significant costs to the Program with little or no statistical or analytical benefits. The Company argued that the additional analyses and reporting recommended by Staff are not related to the goal of the Program, will not be beneficial to its overall evaluation, and will likely delay the Program. *Id.* at 7.

In its comments, Staff noted “it has still not received a full report for the Company’s 1999 Idaho City automated meter reading trial.” *Id.* The Company maintained that although it did not have any reporting obligation on the Idaho City AMR trial, it nevertheless met with Staff in March and April 1998 to demonstrate the system and access meter information. Idaho Power believes that it has acted in good faith and has been forthcoming in all matters related to the 1999 Idaho City AMR trial. *Id.* at 8.

### **COMMISSION DISCUSSION AND FINDINGS**

Conservation and DSM programs are powerful tools Idahoans can use to manage their energy consumption and mitigate the impact of potential rate increases. In recognition of this fact, the Commission reinstated a comprehensive conservation program in 2001. Order No. 28722 at 21. We also directed Idaho Power to form the EEAG to recommend new DSM measures, enhance existing DSM programs, prioritize implementation of appropriate programs and evaluate each program’s effectiveness. Order No. 28894 at 7. This Application was submitted as part of the Company’s efforts to develop a comprehensive conservation program in consultation with the EEAG.



The Commission has reviewed and considered Idaho Power's Application in Case No. IPC-E-02-13. The Commission has also considered the analyses and recommendations of the public, NW Energy Coalition et al., and Staff in this matter. The Commission continues to find that the issues presented are suitable for processing under Modified Procedure, i.e., by written submission rather than by hearing. IDAPA 31.01.01.204.

We agree with Idaho Power, Staff, and the NW Energy Coalition that a DSM program of this sort has significant merit and the potential to benefit Idaho Power ratepayers by reducing summer peak load. As noted in several comments, utilities throughout the country have used AC Cycling Programs for more than 20 years. Although AC Cycling Programs are known to be effective, we believe that a pilot program will allow Idaho Power to test the equipment, gauge customer response and work out potential problems before deciding if it should implement the Program on a larger scale. Moreover, we find that this Program is an appropriate use of monies collected through Energy Efficiency Rider, which was created to fund such DSM programs.

Both the NW Energy Coalition and Staff recommended that the Commission increase the monetary incentive offered to customers who participate in the Program. Given the limited number of participants and the potential customer inconvenience that may result by volunteering for the Program, the Commission finds that it is reasonable to raise the monetary incentive for those who participate from \$5 to \$10 per month. We believe that doing so will result in a more enthusiastic customer response while only marginally increasing Program costs.

Staff and the NW Energy Coalition made several reasonable and interesting recommendations on modifications to improve the Program, including the addition of control groups and a larger number of participants. Rather than force these additional requirements on the party ultimately responsible for the Program, the Commission finds that these issues should be left to the discretion of Idaho Power. Likewise, the Commission will leave the decision to test the effectiveness of each of the three cycling options proposed in the tariff to the Company's best judgment.

We have also reviewed the evidence in the record regarding the possible detrimental effects of cycling on AC compressor life. Although it is conceivable that the program may increase wear on AC compressors, the Commission was not presented with evidence demonstrating that any significant damage was likely to occur as a result of the Program. Staff

described the possible harm to the AC compressor as “small due to the limited number of cycling proposed” and “incremental” over and above the normal wear of ordinary operation. The Commission is unsure how any potential harm could be proven or even detected given the variables that effect the compressor’s operating efficiency. This is particularly true of oversized compressors. Moreover, the Commission notes that similar programs in operation for the last 20 years have not reported problems like those feared by Staff. We find the lengthy problem-free track record of similar programs to be particularly persuasive. For these reasons, the Commission finds it reasonable to leave the decision of whether to advise participants of possible compressor deterioration concerns to the Company’s best judgment.

Idaho Power’s Application stated that the Company will include the results of the AC Cycling Program in the annual DSM Report<sup>1</sup> to the Commission detailing the EEAG’s activities. This report will include the Company’s response to EEAG recommendations, the associated Program costs, demand-side management (DSM) accounting numbers and customer response data. The Commission finds the Company’s proposal to include Program reporting information in the annual DSM Report is an acceptable method of reporting in this case. If the Company so chooses, it may instead file a separate Program report independent of the annual DSM report once the Program ends. Although the Company’s proposed reporting only lists general elements, we expect that this report will contain a comprehensive evaluation that will provide the Commission sufficient information to determine whether the costs were reasonably and prudently incurred. The Company’s Application also indicated that it would not request recovery of any reduced revenue that may result from the AC Cycling Program. If Idaho Power were to change its position on this issue at some point in the future, we wish to make clear that the Commission will not authorize recovery of reduced or “lost” revenues in the context of this AC Pilot Program.

### **ORDER**

IT IS HEREBY ORDERED that Idaho Power Company’s Application seeking authority to institute a Residential Air Conditioner Cycling Pilot Program and implement proposed tariff Schedule 81 is granted as described in detail above.

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<sup>1</sup> In compliance with Order No. 29026, Idaho Power Company filed its first annual DSM Report on January 30, 2003.

IT IS FURTHER ORDERED that the monetary incentive for residential customers who participate in the Residential Air Conditioner Cycling Pilot Program shall be increased from \$5 to \$10 per month of successful participation.

IT IS FURTHER ORDERED that decisions regarding Program modifications, control groups, increasing the number of participants, implementation of cycling options, and whether to advise participants of compressor wear concerns shall be left to the discretion of Idaho Power.

IT IS FURTHER ORDERED that Idaho Power shall file the results of the Residential Air Conditioning Cycling Program as described above.

THIS IS A FINAL ORDER. Any person interested in issues finally decided by this Order or in interlocutory Orders previously issued in Case No. IPC-E-02-13 may petition for reconsideration within twenty-one (21) days of the service date of this Order with regard to any matter finally decided in this Order or in interlocutory Orders previously issued in Case No. IPC-E-02-13. For purposes of filing a petition for reconsideration, this order shall become effective as of the service date. *Idaho Code* § 61-626. Within seven (7) days after any person has petitioned for reconsideration, any other person may cross-petition for reconsideration. *Idaho Code* § 61-626.

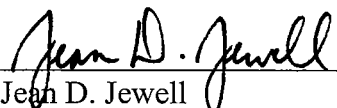
DONE by Order of the Idaho Public Utilities Commission at Boise, Idaho, this 17<sup>th</sup>  
day of March 2003.

  
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PAUL KJELLANDER, PRESIDENT

  
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MARSHA H. SMITH, COMMISSIONER

  
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DENNIS S. HANSEN, COMMISSIONER

ATTEST:

  
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Jean D. Jewell  
Commission Secretary

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