Duke Power Nantahala Area Relicensing

Bryson Hydro Station Energy Conservation Assessment

Introduction

During January of 2000, Duke Power Nantahala Area (DPNA) filed a notice of intent to relicense the Bryson Hydro Project. DPNA received requests for information about energy conservation measures during the initial scoping process for this project. DPNA formed a Technical Leadership Team (TLT) to evaluate energy conservation measures and recommend any enhancements to existing programs.

Objective

The objective of the program was to complete a review of present energy conservation measures and propose alternatives for new conservation programs for consideration by DPNA.

Methods

The TLT formed to address this subject was chaired by a DPNA employee and the members of the TLT were volunteers for the Nantahala Area representing local government, educational institutions, and non-governmental organizations. The TLT met in August and November of 2001, and January 2002. The TLT discussed a number of energy conservation issues during these meetings and developed the following four areas of focus for this assessment:

1. Information and Educational Programs
2. DPNA Hydro System Electricity Uses
3. Alternative Energy Technology and "Green Power"
4. Internal Energy Conservation Initiatives

Results of the Energy Conservation Evaluation

1. Energy Conservation Information and Education Programs

Energy conservation and education opportunities available within Duke Energy Corporation were assessed. Following are the results of the assessment:

Energy Conservation Literature:

This kind of information has always been available to DPNA customers. Following are a list of the publications available:

- "What you should know about Hot Water"
- "What you should know about Air Leaks and Your Home"
- "What you should know about Electric Heat Pumps"
- "What you should know about Refrigerators and Freezers"
- "What you should know about Lighting Energy and Money"
- "What you should know about Home Insulation"
- "What you should know about Energy and Your Mobile Home"
- "Your Energy Dollars at Work"
- "Home Energy Conservation Checklist"

While this material has always been available, there has been no systematic means of distributing this information to DPNA customers.

Energy Audits

In-home energy audits were formerly a part of the DPNA energy conservation program. This labor intensive program was discontinued about 1998. Instead, DPNA now has made available an online energy audit suitable for individual residences or small businesses. This detailed energy audit can be accessed on the internet at http://www.energyguide.com. For larger businesses with more complex energy problems, Duke Power may be able to provide an on-site energy needs assessment along with recommendations on how to solve energy-related problems. Typically these opportunities are discussed on a case-by-case basis with larger industrial or commercial customers.

Environmental Education

Duke Power Conducts a week-long workshop each summer for 25-30 teachers in the Duke Power service area. Information on the workshop can be found at http://dukepower.com.

Additional information for students and teachers can be found on Duke Power's educational web site at http://zaxenergyzone.com.

Other Energy Conservation Programs

DPNA has always had programs available to customers that encourage energy conservation. Special electric rates are available to customers who modify or build their homes to meet insulation and other energy conservation requirements and to large industrial customers that shift usage from peak times. Conservation brochures have been as mentioned above have been provided customers. Ads reminding customers to use energy wisely have been placed in many local publications. As discussed, audits of energy use have been provided to customers, and self-audits are currently available on the internet. There are also external programs related to energy conservation. One example is the Rebuild America Program (http://www.rebuild.org) which provides grants for school and urban restoration projects seeking to rebuild areas in ways that conserve energy.

2. Nantahala Area Hydro System Uses

DPNA projects have a combined total of 100 MW. In 1974 electrical demand in the Nantahala Area surpassed the 100 MW capacity of the DPNA system. Because of peaking power needs and recreational flow releases, DPNA hydro projects have not been able to completely meet the annual electric energy needs of NA customers since 1971 and purchased power has been needed to meet customer demand. Population and concomitant electric energy requirements of customers in the Nantahala Area

have increased considerably in the last 50 years. Now, purchased power is meeting all new load growth and is a larger and larger portion of system supply. Because of this increased demand for electricity, power produced by the Nantahala Area hydro stations is always used directly by NA customers.

3. Alternative Energy Technology and "Green Power" Opportunities

As with other generation technologies deployed by Duke Energy, renewable energy generation technologies must be economically attractive in addition to their having technological feasibility. Duke Energy considers the development of clean, renewable energy sources to be a matter of importance. Duke Energy has been involved in the following related initiatives:

Duke Solutions

Duke Solutions is a Duke Energy Company that provides comprehensive energy management, energy efficiency and productivity services as well as energy consulting services to various commercial and industrial segments in the U.S. and Canada. Duke Solutions has also partnered with other companies to develop a large scale application of poultry waste-to-energy-to-organic fertilizer operation. More information about Duke Solutions can be found at the following web-site: http://www.dsi.duke-energy.com.

Green Power

Duke Power is participating in a collaborative effort with utilities, environmental and renewable energy stakeholders to develop a statewide, voluntary green power program in North Carolina. Advanced Energy has formed an advisory committee, of which Duke Power is a participant, to develop, implement and market the program. More information about North Carolina's "Green Power" initiative can be found on the internet at http://www.advancedenergy.org.

4. Internal Energy Conservation Initiatives

During the consultations with the TLT members questioned what kind of energy conservation measures Duke Energy business units had in place. Energy is one of the major operational costs for all Duke Energy business units. Competition demands that energy costs receive close scrutiny across all business units. As with all Duke generation assets, DPNA hydro projects receive regular maintenance and upgrades to make them as efficient as possible. This includes leakage protection and conservation of water resources whenever possible. For instance releases into bypass areas have a tremendous effect on resource conservation for the DPNA hydros. Since these releases do not pass through electric generation equipment they contribute to an overall loss of efficiency for the system and are very costly to DPNA requiring efficiencies to be compensated for in other areas or increased purchases from other generating sources.

Recommendations for Enhancements

Based on the preceding assessment of energy conservation and other energy conservation related programs within Duke Energy, DPNA will implement the following enhancements:

1. **Printed Literature on Energy Conservation Measures:**
   Information will continue to be made available to all DPNA customers. This information will be reviewed and updated. In addition, a better system will be established for getting this information to the customer.
2. **Energy Conservation Web-Site**
   An Energy Conservation website will be added to the Duke Power and/or Duke Power Nantahala Area website that will contain electronic copies of printed literature and links to sites mentioned in this report. This site will updated annually to include new developments and links as technological advances are made.

3. **Teacher Workshops**

   Any teacher workshops sponsored or co-sponsored by Duke Energy or DPNA will devote more time to energy conservation issues.