

Exhibit H

Information Required for New License

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H.1 Plans and Ability of the Applicant to Operate and Maintain the Project

H.1.1 Plans to Increase Capacity or Generation

Throughout the term of the current license, Alcoa Power Generating Inc. (APGI) has maintained the Yadkin Project (Project) to maximize generation value and efficiency. These efforts have included structural modifications, unit refurbishments, generator rewinds, and runner replacements. Under the new license, APGI plans to continue its refurbishment and upgrade program to ensure efficient and reliable electric service in the future. Unit refurbishments and potential upgrades at High Rock, Tuckertown, Narrows, and Falls Developments are proposed for completion under the new license (see Exhibits B.2 and E.2.7).

H.1.2 Plans to Coordinate Project Operation with Other Water Resource Projects

Historically, APGI has coordinated the operation of its facilities with the Tillery and Blewett Falls developments owned by Progress Energy downstream. This coordination has taken place pursuant to an agreement between the parties that dates from 1928 but which has been modified over the years, most recently in 1968, and the related FERC order issued in March 1968. Further modifications to this arrangement may be necessary depending on the terms of a new license for the Yadkin Project.

APGI schedules energy availability by Thursday noon for the coming week, allowing APGI to determine subsequent water flows downstream. Operating schedules are shared daily with the downstream project owner to communicate delivery of water. The U.S. Army Corps (USACE) operates and maintains a flood control project, W. Kerr Scott upstream of the Yadkin Project. Discharges from the USACE project are available on the Internet. APGI's operation of its reservoirs will be within the allowable drawdown limits of the license.

H.1.3 Plans to Coordinate Project Operation with Other Electrical Systems

The APGI generation and transmission system operates as a North American Electric Reliability Council (NERC) Balancing Authority. The facilities are operated in compliance with NERC and Southeastern Electric Reliability Council (SERC) guidelines.

The Project facilities are operated from the Dispatch Center in Alcoa, Tennessee, which is staffed 24 hours per day with NERC-certified operators. In addition, there is a backup Dispatch Center in Badin, North Carolina, that is equipped for full functionality should the need arise.

The Project is connected to the Duke Energy transmission system and the Progress Energy transmission system via APGI's 100 kilovolt (kV) transmission facilities.

H.2 Need of Applicant for Electricity Generated by the Project

Alcoa Inc. (Alcoa) owns all of the outstanding common stock of APGI and is the nation's largest producer of aluminum and aluminum products. Alcoa has several aluminum smelters and related operations in the United States, including extensive operations in the southeast and midwest regions, particularly in North Carolina, South Carolina, Indiana, and Tennessee. Aluminum smelting requires large amounts of low cost, reliable electricity, and energy can comprise more than 30 percent of the cost of producing aluminum. Thus, the competitiveness of Alcoa's primary aluminum business is closely tied to the availability of economical electric power rates. For this reason, Alcoa has located its smelting operations in close proximity to low-cost sources of reliable electric power such as the Yadkin Project hydropower developments, owned and operated by APGI. The Yadkin Project is critical to Alcoa's Primary Metals Operations because it enables Alcoa to maintain its competitiveness in the domestic aluminum market. For many years, the power from the Yadkin Project was a source of power for Alcoa's Badin Works, an aluminum smelter and processing plant. More recently, the smelting operations at Badin were curtailed, but the hydropower developments have continued to supply some power directly to Badin Works, with the remaining power sold to help offset the cost of electricity purchases required for Alcoa's other domestic smelting operations. Currently, the Yadkin Project provides 3 to 5 megawatts (MW) of electricity directly to Badin Works for aluminum refining and other operations that still occur at the plant, with the balance being sold into the wholesale market. Whether the energy from the Yadkin Project is sold into the wholesale market or used to directly supply Alcoa's smelting facilities, access to that source of low cost power is important to Alcoa's Primary Metals Business.

H.2.1 Reasonable Costs and Availability of Alternative Sources of Power

If the power and energy generated by the Yadkin Project were not available, Alcoa would require a replacement source of energy that is of equal value to that being supplied by the Project in order to retain the current economics of Alcoa's primary aluminum operation in the U.S. The Project's non-affiliated wholesale customers would be faced with obtaining firm or spot market power at a cost not to exceed that currently being paid for energy from the Yadkin Project. It is likely that the alternative source of on-peak energy to replace on-peak energy currently being obtained from the Yadkin Project's hydroelectric generation would be generated from coal or natural gas combustion at a higher economic and environmental cost.

H.2.2 Increase in Fuel, Capital, and Other Costs

If APGI were not granted a new license for the Yadkin Project, APGI's cost would include a cost equal to the loss of the market value of the Yadkin Project hydroelectric generation minus the cost of producing such generation. Whether the power generated by the Yadkin Project is consumed by the load at Alcoa's Badin Works or sold on the wholesale market, the difference between the cost of generation and the price on the wholesale market is the value that APGI receives from the Project.

The Project's wholesale customers would incur a cost increase equal to the price of replacement power minus the price currently being paid for the Yadkin Project hydroelectric generation.

H.2.3 Effects of Alternative Source of Power

See Exhibit H.2.

H.2.3.1 Effects on Applicant's Customers, Including Wholesale Customers

As discussed in Exhibit H.2, loss of the value of the Yadkin Project hydroelectric power by Alcoa would affect the costs for Alcoa's primary aluminum business.

In addition, customers other than Alcoa who presently purchase power would have to purchase from alternative sources if Project power were to become unavailable. At present, the only alternative generation for sale in the region comes from coal-fired facilities, gas-fired combustion turbines, or nuclear facilities generally at much higher costs and prices.

H.2.3.2 Effects on Applicant's Operating and Load Characteristics

As it is unlikely that alternative electric energy would be generated within APGI's system, electrical energy from any alternative source of power would be a net flow of power into the Yadkin Balancing Authority from the Duke Energy or Progress Energy transmission systems. The load at the Alcoa Inc. Badin Works would be fed by the alternative source of power instead of the Yadkin Project hydroelectric generation.

H.2.3.3 Effects on Communities Served or to be Served

The Yadkin Project does not sell power either wholesale or retail directly to communities. However, the Yadkin Project does enhance the reliability and power quality of the communities located in the area surrounding the Project. The Yadkin Project operates as a separate balancing authority within the SERC, responsible for the proper and reliable operation of its electric system in coordination with the electric power systems of neighboring utilities, specifically Duke Power Company and Progress Energy North Carolina. This includes responsibility for assuring that the power flows in and out of APGI's system are balanced, that voltage is maintained, and that frequency is held within strict limits. These actions by APGI, in concert with other utilities in North and South Carolina and Virginia, ensure that retail customers in North Carolina receive a reliable supply of electricity, with adequate reserve margins in both generation and transmission. The Yadkin Project also provides reactive power for voltage support of the transmission grid. There are instances that the Yadkin Project provides electrical energy for retail utilities when those utilities purchase Yakin Project power during times of equipment failure, weather related outages, maintenance outages and equipment upgrades. For instance, during the summer of 2005, the Yadkin Project provided electrical energy for Duke Power to communities north of APGI's High Rock transmission line connection with Duke Power while local transmissions lines were being upgraded by Duke Power.

H.3 Need, Reasonable Cost, and Availability of Alternative Sources of Power

H.3.1 Average Annual Cost of Power Produced by the Project

Table H.3-1 presents the average annual cost of the power produced by the Yadkin Project over the last two years. This includes the cost of capital and amortization.

Table H.3-1: Average Annual Cost of Power Produced by the Yadkin Project

Year	Cost
2004	\$16,335,879
2005	\$15,755,551

H.3.2 Resources Required to Meet Capacity and Energy Requirements

H.3.2.1 Energy and Capacity Resources

Currently the Yadkin generation capacity and energy is greater than the resources required by the load being served within the Yadkin system. Energy production that is greater than the required resources is sold on the wholesale market. Should additional resources be required in the future those resources would be purchased on the wholesale market.

H.3.2.2 Resource Analysis

Because of the requirement for low cost power arising out of the economics of aluminum manufacturing, there do not appear to be such alternatives to replace the capacity and energy from the Yadkin Project available in the wholesale market. Although capacity and energy could be purchased over the short and long-term to replace Yadkin Project power, the purchase price for such resources almost certainly render this power uneconomic for aluminum production. However, this would not be true regarding the wholesale customers who currently purchase some of the Yadkin Project output as such sales are made at market prices.

H.3.2.3 Effects of Load Management Measures

Load management measures would not have an effect, for the reasons stated above.

H.3.3 Costs of Alternative Sources of Power

H.3.3.1 Annual Cost of Each Alternative Source of Power to Replace Project Power

The annual cost to replace the Project capacity and energy with purchased power from the wholesale market would be at least equal to the estimated annual value of Project power which is \$43,600,000 (see Exhibit D.5).

The least cost option for the construction of new generating facilities to replace the Project capacity and energy would be a conventional or advanced combustion turbine at \$374/kilowatt (kw) to \$395/kw (see Table H.3-2). The operating cost of any fossil fuel power plant is highly dependent on fuel cost. The estimated construction cost of a 250 MW conventional or advanced combustion turbine would be in the range of \$94,000,000 to \$95,000,000 with an annual operating cost of \$59,000,000 to \$69,000,000 to produce energy equal to the Project power (see Table H.3-3). This includes O&M and fuel cost. Property tax, depreciation, cost of capital, and any regulatory costs are not included.

Table H.3-2: Cost and Performance Characteristics of New Central Station Electricity Generating Technologies^a

Technology	Size (MW)	Leadtimes (Years)	Total Overnight Cost in 2004 (2003 \$/kW)	Variable O&M (2003 mills/kWh)	Fixed O&M (2003 \$/kW)	Heatrate in 2004 Btu/kWh)
Scrubbed Coal New	600	4	1,213	4.06	24.36	8,844
Integrated coal-gasification Combined Cycle	550	4	1,402	2.58	34.21	8,309
IGCC with Carbon Sequestration	380	4	2,008	3.93	40.26	9,713
Conv Gas/Oil Comb Cycle	250	3	567	1.83	11.04	7,196
Adv Gas/Oil Comb Cycle	400	3	558	1.77	10.35	6,752
ADV CC with Carbon Sequestration	400	3	1,114	2.60	17.60	8,613
Conv Combustion Turbine	160	2	395	3.16	10.72	10,817
Adv Combustion Turbine	230	2	374	2.80	9.31	9,183
Fuel Cells	10	3	4,250	42.40	5.00	7,930
Advanced Nuclear	1000	6	1,957	0.44	60.06	10,400
Distributed Generation-Base	2	3	807	6.30	14.18	9,950
Distributed Generation-Peak	1	2	970	6.30	14.18	11,200
Biomass	80	4	1,757	2.96	47.18	8,911
MSW – Landfill Gas ^{3,108}	30	3	1,500	0.01	101.07	13,648
Geothermal	50	4	3,108	0.00	104.98	45,335
Conventional Hydropower	500	4	1,451	4.60	12.35	10,338
Wind	50	3	1,134	0.00	26.81	10,280
Solar Thermal	100	3	2,960	0.00	50.23	10,280
Photovoltaic	5	2	4,467	0.00	10.34	10,280

a. Information in this table is taken from Table 38 in Cost and Performance Characteristics of New Central Station Electricity Generating Technologies in Energy Information Administration/Assumptions to the Annual Energy Outlook 2005.

Table H.3-3: Cost of a 250 MW Conventional and Advanced Combustion Turbine to Produce 982,000 MWh

Technology	Variable O&M Cost	Fixed O&M Cost	Average Natural Gas cost cents/10 ⁶ 2004 ^a	Fuel Cost	Total Annual Cost ^b	\$/MWh
Conv Combustion Turbine	\$3,103,120	\$2,680,000	596.1	\$63,319,495	\$69,102,615	\$70.37
Adv Combustion Turbine	\$2,749,600	\$2,327,500	596.1	\$3,754,545	\$58,831,645	\$59.91

- a. Natural gas cost is from Table 4.5 Receipts, average Cost, and Quality of Fossil Fuels for the Electric Power Industry, 1993 through 2004 Energy Information Administration Electric Power Annual 2004.
- b. Total cost is O&M and Fuel Cost. Property taxes, cost of capital, depreciation, and any regulatory costs are not included.

H.3.3.2 Basis for Determination of Annual Cost of Each Alternative Source of Power

The basis for determination of the cost of purchased power is the value of Project power from Exhibit D.5. To develop this estimate, APGI modeled the existing Project operations with the addition of proposed generating unit upgrades in the Yadkin Project Operations Model, OASIS, for the 1930 to 2003 period of record using the average monthly on and off-peak energy values for 2004 presented in Exhibit D.8.

The basis for determination of the construction and operating cost of a combustion turbine facility with a capacity of 250 MW and energy production equal to the Project power is data from the Energy Information Administration/Assumptions to the Annual Energy Outlook 2005 and the Energy Information Administration/Electric Power Annual 2004.

H.3.3.3 Relative Merits of Each Alternative

The estimated long-term average annual cost of the Project power is \$28,310,097 (see Exhibit D.4). This is the long-term cost of power production that seems to be appropriate to compare to the cost of alternative sources of power. The cost of replacement power from the wholesale market is estimated to be \$43,600,000. This is a 55 percent increase in the cost of power and equal to the current Project power value. The source of generation for power from the wholesale market would be from fossil fuels (or possibly nuclear generation).

The estimated average annual cost of operating a combustion turbine is \$59,000,000 to \$69,000,000, which is a 110 to 145 percent increase in cost. This increase in cost does not include the debt and equity cost of capital and the depreciation for the \$94,000,000 to \$95,000,000 cost of the construction of a combustion turbine facility.

In addition, either of these alternatives would have the added environmental impact of additional fossil fuel combustion releases which would impact air quality in the region. Significant

quantities of carbon dioxide and nitrous oxide and lesser quantities of carbon monoxide and sulfur dioxide would be produced as a byproduct of combustion.

H.3.4 Effect on the Direct Providers of Alternative Sources of Power

There would be additional resource requirements on the power system(s) and transmission system(s) that supply the energy to the Yadkin Project if replacement energy were purchased on the wholesale market. The specific power facilities and transmission facilities that would be affected are unknown.

H.4 Effect of Obtaining or Losing Electricity on the Applicant's Own Industrial Facilities

The effect of obtaining or losing electricity on Alcoa's industrial facilities is discussed previously in Exhibit H.2.

H.5 The Impact on the Operations and Planning of the Applicant's Transmission System

H.5.1 Effects of Power Flow Redistribution

The Yadkin Project is connected to the Duke Energy transmission system and the Progress Energy transmission system at Badin and High Rock via the APCI 100kV transmission facilities.

As addressed previously in Exhibit H.2.3.3, the Yadkin Project system is used to increase reliability of electricity in the geographic region. During periods of forced outages on generating units in adjacent utilities, and in high North-South or South-North power flows, the Yadkin Project generation is redirected on the interconnected transmission system to offset high line loading during abnormal conditions. Redistribution of the power flows reduces the line loading to within acceptable engineering limits. Reductions or restrictions in the amount or timing of APCI's power generation would prohibit APCI from alleviating these overloading conditions which could lead to opening of line breakers on the transmission system to redirect the flow of power in the immediate area, and thus affect reliability of electricity.

H.5.2 Advantages of the Applicant's Transmission System

The Yadkin Project transmission system was originally primarily used to connect the generating facilities of the Project, and to provide a path for additional power to increase the reliability of the electricity supply to Alcoa's Badin Works during low Project generation periods through interconnections with local utilities Duke Energy and Progress Energy North Carolina. Originally these transmission facilities were all part of the Project, but as Duke Energy and Progress Energy expanded their own transmission facilities in the region, it became apparent that the bulk of the Yadkin Project 100 kV transmission facilities had become part of the larger interconnected transmission grid. Subsequently, the Project license was amended to remove all but two transmission lines from the Project.

The two transmission lines that remain in the Project are 1) the four- circuit 13.2-kV line that connects the Narrows Powerhouse to a switchyard located at Alcoa's Badin Works and 2) the single-circuit 100-kV line that connects the Falls Powerhouse to the Badin substation. Thus, there is limited transmission in the Yadkin Project that would materially help regional electrical reliability. Delivery of Project energy to Alcoa's Badin Works and/or to the interconnections with Duke Energy and Progress Energy at the Badin substation and High Rock powerhouse does benefit the regional distribution of the Project's power and to help provide voltage regulation in the area. These uses will remain an important function of Yadkin's transmission system when a new license is granted.

APGI's non-Project transmission system consists of approximately 15 miles of single-circuit 100-kV transmission lines that run from the High Rock Development, through the Tuckertown Development and continue to a switchyard at Alcoa's Badin Works.

H.5.3 Single Line Diagrams

The electrical one-line diagram is shown in Figure H-1.

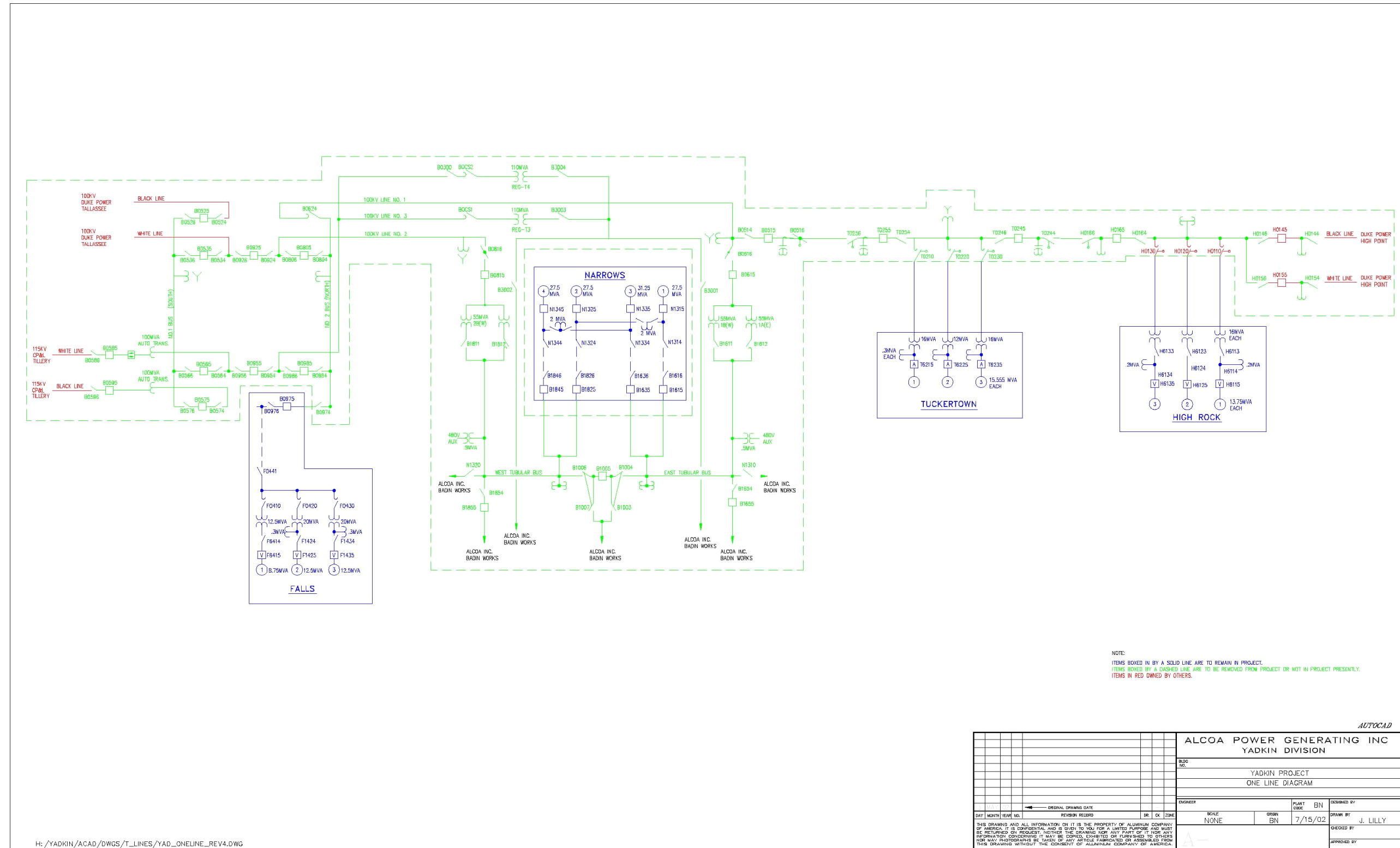
H.6 Plans to Modify Existing Project Facilities

During the new license, APGI proposes to replace existing turbine runners, rewind generators, and refurbish auxiliary equipment at all Project developments (see Exhibit B.2). The facilities proposed for refurbishment are nearing the end of their useful operating lives and are in need of overhaul or replacement. Replacement of the turbine runners will result in increased hydraulic efficiency. Similarly, rewinding the generators and completing associated refurbishments to the electric controls will increase the efficiency by which mechanical energy is converted to electric energy.

In evaluating the proposed unit upgrades, APGI considered the potential effects of the unit upgrades on environmental resources. In this regard, APGI proposes to enhance Project water quality by modifying the design of the replacement runners and draft tube cones in such a way as to enhance the dissolved oxygen conditions in the Project tailraces at the High Rock and Narrows developments. This proposal is discussed in more detail in Exhibit E.2.7.

The planned unit upgrades, refurbishments, along with the installation of technology to improve dissolved oxygen will conform with the comprehensive plan for improving the waterway and for other beneficial uses as defined in Section 10(a)(1) of the Federal Power Act (FPA).

Figure H-1: Yadkin Project One-Line Diagram



H.7 Financial and Personnel Resources

As a wholly-owned subsidiary of Alcoa Inc., APGI has sufficient financial resources to continue operating and maintaining the Project, as well as perform the unit refurbishments/upgrades that are being proposed under the new license.

As previously mentioned, all four Project developments are operated by full-time Power Dispatchers under the direction of the APGI Operations Manager. Operation and generation dispatch is remotely controlled from the Dispatch Center located in Alcoa, Tennessee. The Project is staffed by a crew either located at High Rock or Narrows powerhouses, or at the plant in Badin, North Carolina. The crew consists of multi-craft hydroelectric mechanics, electronics technicians, and supervisors.

The technical support staff is based in Badin, North Carolina and Alcoa, Tennessee, in the same building as the Dispatch Center. The support staff consists of electrical and mechanical engineers, and technical and office personnel. Members of the technical support staff have formal education in their field of expertise and are expected to stay abreast of developments in the hydroelectric industry through continuing education opportunities.

The entire staff receives annual safety training that goes beyond the current state and federal requirements.

Routine maintenance for all four developments is performed by either contracted maintenance crews or by maintenance crews based at the facilities. Major maintenance is normally contracted under specifications by APGI's Engineering Department.

H.8 Proposed Expansion of Project Lands

APGI does not propose to expand the Project to encompass additional lands.

H.9 Applicant's Electricity Consumption Efficiency Improvement Program

H.9.1 Applicant's Record of Encouraging Power Conservation and Plans for Promoting Power Conservation

All of the electricity that APGI generates at the Project is for the benefit of its ultimate customer, Alcoa, and specifically, Alcoa's smelting facilities, whether the Project power is sold in the wholesale market or used directly. The nature of the aluminum smelting process makes energy efficiency a top priority for Alcoa.

Alcoa and other primary aluminum companies produce aluminum from alumina by an electrolytic reduction process that requires large amounts of electric energy as an industrial input. Electric energy accounts for more than 30 percent of the cost of a pound of aluminum produced at an aluminum smelter, and as such, is often the largest single variable cost in the production of

aluminum metal and the most significant factor in determining a company's competitive position in the market

Alcoa's smelters are constantly seeking opportunities to reduce operating costs. Such cost savings are often realized through improved energy efficiency both in the industrial smelting process and in the generation of electric power. As described in Exhibit H.6, Plans to Modify Existing Project Facilities, APGI has initiated phased-in refurbishments and upgrades of aging equipment in order to generate additional electric power from the same water flows on the Yadkin River. In addition, the aluminum smelting industry in general and Alcoa in particular are constantly searching for ways to improve energy efficiency in the smelting process. The Aluminum Association, Inc. estimates that optimization of aluminum smelting processes has reduced the energy demands by more than 20 percent (from more than 8kWh to approximately 6.5kWh per pound) over several years.

Finally, Alcoa also has implemented a long-term energy strategy for the past several decades. New policies developed in the wake of the energy crisis of the 1970's sought to increase self-sufficiency in energy generation and greater energy efficiency at every step of the manufacturing process. More recently, Alcoa has formulated an energy efficiency plan that benchmarks best practices in the industry and makes them available to Alcoa locations. The foundation of the plan is the formation of a network of energy users at Alcoa locations that embrace and employ best practices for improving energy efficiency.

H.9.2 Compliance of Power Conservation Programs with Applicable Regulatory Requirements

The power conservation efforts described in Exhibit H.9.1 meets the intent of the Federal Power Act Section 10(a)(2)(C). There are no State regulatory requirements applicable to the Yadkin Project concerning power conservation programs.

H.10 Identification of Indian Tribes Affected by the Project

Since the distribution of the Initial Consultation Document (ICD) in September 2002, APGI has worked to engage the Catawba Indian Nation (CIN) and the Eastern Band of Cherokee Indians (EBCI) in the relicensing of the Yadkin Project. In addition to the identified tribes, APGI also provided a copy of the ICD to the North Carolina Commission of Indian Affairs.

The current Catawba Indian Nation Reservation is located in South Carolina on the Catawba River. The traditional ceded homelands of the tribe do extend through the entire Piedmont of North Carolina. The Catawba Indian Nation indicated an interest in the Yadkin Project relicensing and has participated as a member of the Cultural Resources Issue Advisory Group. The Catawba Indian Nation identified several interests regarding the Project relicensing that are discussed in more detail in Exhibit E.4.

In a meeting in July 2004, EBCI shared with APGI a map of lands to which they attach religious or cultural significance, and none of the five counties immediately adjacent to the Yadkin Project were identified as significant. EBCI has remained on APGI's distribution list for all relicensing

related materials, meeting notices and communications. However, the EBCI did not directly participate in the Issue Advisory Groups.

Contact information for the two tribes with an expressed interest in the Yadkin Project relicensing is provided below:

The Catawba Indian Nation of South Carolina
Chief Gilbert B. Blue
996 Avenue of the Nations
Rock Hill, SC 29730

The Eastern Band of Cherokee Indians
Chief Michell A. Hicks
88 Council House Loop
Cherokee, NC 28719

H.11 Measures Planned to Ensure Safe Management, Operation, and Maintenance of the Project

APGI strictly adheres to the FERC regulations for maintaining safety at all of its developments within the Project. As such, APGI prepares quality control programs during construction, repair, and modifications of Project works; prepares adequate provisions for installing and maintaining appropriate monitoring instrumentation wherever any physical condition has the potential to affect the safety or stability of the Project; and prepares public safety plans. In addition, APGI performs periodic inspections, every five years, of the Project facilities by an independent consultant, performs power and communication lines testing, and performs annual spillway gates testing.

Also in accordance with FERC guidelines, the Project has an Emergency Action Plan (EAP), which was most recently revised and updated in December 2005. The EAP serves as a tool to APGI personnel as well as public safety agencies to ensure public safety while minimizing property damage in the unlikely event of a failure or potential failure of High Rock, Tuckertown, Narrows, or Falls Dam.

The reservoir and tailrace elevations are monitored continuously by float-operated or sonic transducers. The elevations are recorded hourly at the Dispatch Center in Alcoa, Tennessee. Any significant change in the reservoir or tailrace elevations will be noted by the power dispatcher.

High Rock and Narrows powerhouses are manned by APGI mechanics. The Tuckertown and Falls Developments are unmanned, but are inspected each manned shift. The staff is well trained and routine surveillance of potential hazards is included in the operation of the facilities. Any abnormal condition is reported to the power dispatcher, the operations general supervisor, and/or the maintenance coordinator.

Instrumentation monitoring plans are also set up at the Project facilities to monitor conditions at the developments to alert staff to possible problems.

Weekly inspections of pertinent operating and safety features are performed by the APGI operating personnel. In addition, annual inspections of the Project structures are conducted by APGI's supervisory and engineering personnel with documentation of conditions. Routine

maintenance for all four developments, including trash removal, is performed by either contracted maintenance crews or by maintenance crews based at their facilities. Major maintenance is normally contracted under specifications by APCI's Engineering Department.

The backup diesel generators are inspected on a weekly basis and tested on a monthly basis to ensure operability of the spillway gates. The spillway gates are tested annually at each development and a full-open gate testing is performed on a five year basis. The data communication lines are tested daily, and voice communication lines are tested weekly.

H.11.1 Existing and Planned Operation of the Project During Flood Conditions

During unusually high flow conditions (greater than 30,000 cubic feet per second [cfs]), maintenance personnel are sent to the Project dams, as required, to operate bypass and spillway gates, and monitor general conditions at the Project dams. Each Project development uses a "Standard Gate Operating Procedure" for discharging water through the spillway gates during flood conditions.

All four dams are continuously monitored at the Dispatch Center located in Alcoa, Tennessee through a Supervisory Control and Data Acquisition (SCADA) system. The SCADA system provides real-time monitoring, reporting, and alarming of key elements associated with the normal operation of the dams, including, but not limited to, power generation, unit operation, and reservoir and tailrace elevations. APCI's operation of all four hydro developments as an integral system allows for advance notice of impending flood flows, including localized storm events. Any significant change in the reservoir elevation due to inoperability of the gates or other conditions will be noted by the Dispatcher who will alert the necessary personnel at Alcoa's plant in Badin, North Carolina. These remote monitoring devices provide for a timely response to an adverse condition if it were to occur.

The principal means of communication during an emergency, including flood events, consist of the Yadkin PBX system, the public telephone, cell phones, and two-way radios carried by APCI maintenance crew while working on the dams. There are two base stations for the two-way radio system, one at High Rock Powerhouse and one at Building 105 (Badin Plant) - a backup station, in case the High Rock Powerhouse station system is inoperable. Communication is possible between the base station and the mobile units, between the independent mobile units, as well as the Dispatch Center in Alcoa, Tennessee

H.11.2 Warning Devices Used to Ensure Downstream Public Safety

APCI maintains a comprehensive public safety program to ensure the structural adequacy of the Project dams and the safety of the public within the Project area. All four of the Project dams are inspected annually by a team of APCI's supervisory and engineering personnel. Independent consultants, approved in advance by FERC and engaged by APCI, thoroughly examine the development structures once every five years and publish a comprehensive Safety Inspection Report. The most recent Independent Safety Inspection Reports for the Project developments were prepared in 2003 and 2004 by PB Power.

APGI maintains a current EAP for the Project in the event of high flows, or the unlikely event of a failure or potential failure of the Project dams. This plan is designed to minimize danger to people and property downstream of the High Rock, Tuckertown, Narrows, and Falls Dams. The EAP provides guidelines for notification and early warning of local, state, and federal agencies, emergency services staff, and the public in the event of an actual or potential failure. Developed in accordance with FERC guidelines, the EAP is tested and updated annually. This EAP includes a flood warning notification to the National Weather Service and other agencies during periods of high release (high flows) from the Project developments.

Some of the specific safety measures employed at the Project include fencing, lighting, signs at the dam forebays and tailraces, and turbulent water and spillway warning signs.

At all four Project dams, a warning/sounding alarm is present at the spillway gates and tailwater of generating units. Sounding the alarm prior to starting a unit or opening a spillway gate is a separate control action from opening of the spillway gate.

H.11.3 Proposed Changes Affecting the Existing Emergency Action Plan

APGI does not propose any changes to the operation of the Project that might affect the existing EAP. The EAP was most recently updated in December 2005.

H.11.4 Existing and Planned Structural Monitoring Devices

Instrumentation monitoring plans have been set up at each of the Project facilities to monitor conditions at the developments and to alert staff to possible problems. The following sections discuss monitoring at the Project developments. No changes are proposed at this time.

H.11.4.1 High Rock Dam and Powerhouse Monitoring Devices

The instrumentation program consists of deformation monitoring (inclinometers, extensometers, crackmeters, and survey points), piezometers, thermistor readings, seepage measurements, precipitation measurements, and reservoir and tailwater level monitoring devices.

H.11.4.2 Tuckertown Dam and Powerhouse Monitoring Devices

The instrumentation program consists of deformation monitoring (inclinometers), piezometers, seepage, and reservoir and tailwater level monitoring devices.

H.11.4.3 Narrows Dam and Powerhouse Monitoring Devices

The instrumentation program consists of deformation monitoring (extensometer and inclinometers), seepage, and reservoir and tailwater level monitoring devices.

H.11.4.4 Falls Dam and Powerhouse Monitoring Devices

The instrumentation program consists of deformation monitoring (survey) and reservoir and tailwater level monitoring devices.

H.11.5 Project’s Employee and Public Safety Record

As previously mentioned, the entire APCI staff receives annual safety training that goes beyond the state and federal requirements. The safety process consists of a highly developed combination of protective equipment, procedures, inspections, observations, and audits. The success of the process is evident in the fact that APCI has not had a lost workday due to injury since September 23, 1986.

The Project is a popular destination for boating, camping, fishing, swimming, and various other recreation activities. The high use and popularity of the Project’s large reservoirs, currently with 40 recreation facilities and access areas available to the public use, contributes to the high number of public safety incidents. Table H.11-1 presents a brief description (with dates) of reported deaths and injuries that have occurred within the Project boundary from the beginning of 2004 through December 31, 2005.

Table H.11-1: Summary of Injuries and Deaths at the Yadkin Project 2004 -2005

Date	Reported Injury/Fatality
3/21/2004	Drowning of a 35 year old male on High Rock Reservoir. Boat overturned in rough waters. Victim was not wearing a life jacket.
6/2/2004	Overturning of a boat in the Tuckertown Powerhouse tailrace on Narrows Reservoir.
10/29/2004	Apparent suicide (shooting). A 22 year old male found in picnic table at the Southmont Public Access Area on High Rock Reservoir, Davidson County.
11/18/2004	Drowning of an 81 year old male on High Rock Reservoir, near a commercial lake access area off Bringle Ferry Road, Rowan County. Victim had a history of heart problems and his boat was found tied to a pier.
6/3/2005	Drowning of a 43 year old male on High Rock Reservoir. Victim was hit by a propeller when he fell off from a boat that took on water.
7/21/2005	Drowning of a 21 year old male on High Rock Reservoir. Victim was swimming near edge of roped off swimming area approximately 50 feet from shore. Victim was not wearing a life jacket.
8/06/2005	Drowning of a 30 year old male on Narrows Reservoir. Victim was swimming outside the roped swimming area to the opposite shore approximately 30 yards away.
9/17/2005	Death of a 26 year old male on Falls Reservoir. Victim was a diver performing work in the intake area of Falls Powerhouse.
12/22/2005	Drowning of a 14 year old male on High Rock Reservoir. Victim was duck hunting with three other males when their boat capsized. The other three persons were rescued.

H.12 Current Operation of the Project

The High Rock Development is a storage facility that is operated in a store-and-release mode. The Narrows Development has storage available, but is generally operated as essentially a run-of-river¹ facility on a daily basis. Based on the limited available storage capacity, the Tuckertown and Falls Developments are essentially operated as run-of-river facilities on a daily basis. Generally, the plants operate during peak hours to maximize the economic value of the power produced. During periods of high stream flow, the system is operated continuously.

As part of its current license with the FERC, APGI operates the Project under operating guides developed with consideration given to many diverse interests including energy generation, recreation, environmental stewardship, downstream municipal and industrial needs, and others. Specifically, the water releases from the Project developments are governed by two FERC orders: one order governs the Project operation under an operating guide for the High Rock Reservoir, and the second order governs the headwater benefits agreement between APGI and Progress Energy.

The High Rock Development is currently operated in accordance with an approved operating guide curve which regulates generation, not headwater elevation. Within the limitations of available streamflow, the operating guide curve is designed to maintain higher water elevations from mid-May to mid-September, followed by a fall-winter drawdown to allow for refill during the late winter and spring runoff. The operating guide curve, reviewed and approved by FERC, was established in 1968, ten years after issuance of the existing license. During periods of low High Rock water levels and low streamflows, the operating guide has an overriding reservoir elevation requirement for APGI to limit discharge to a maximum amount of water on a weekly basis from early March to mid-September to help maintain High Rock water levels.

In addition to the operating guide curve, APGI operates in accordance with an associated 1968 agreement and FERC order related to headwater benefits. Water storage in the APGI reservoirs during periods of high streamflow allows a controlled release to enhance watershed power generation. This regulation of flow provides benefits to APGI and to Progress Energy, by seasonally increasing the flow available for hydropower generation at the downstream facilities. By way of the March 1968 FERC order, Progress Energy pays APGI an annual headwater benefits fee for this benefit. The agreement with Progress Energy requires that the regulated weekly average streamflow, during the ten-week period preceding the recreation period (May 15 through September 15) is not less than 1,500 cfs; during the period May 15 through July 1, is not less than 1,610 cfs; and during the period July 1 through September 15, is not less than 1,400 cfs.

Available storage at Narrows Reservoir may be used during periods of low streamflow to maintain the required minimum downstream releases. Table H.12-1 lists the drawdown relationship between High Rock and Narrows reservoirs as defined by the current Project license.

Current Project operation is discussed in more detail in Exhibit B.

¹ Run-of-river means that the average daily discharge is approximately equal to the average daily inflow, with daily fluctuations occurring to meet system operating demands.

Table H.12-1: Drawdown Relationship Between High Rock and Narrows Reservoirs

High Rock Reservoir		Narrows Reservoir	
Elevation (ft)	Drawdown (ft)	Elevation (ft)	Drawdown (ft)
623.9	0.0	509.8 – 507.7	0.0 – 2.1
622.9	1.0	508.2 – 503.2	1.6 – 6.6
599.9	24.0	508.2 – 503.2	1.6 – 6.6
599.9	24.0	502.7	7.1
597.9	26.0	493.7	16.1
593.9	30.0	478.8	31.1

H.13 History of the Project and Record of Programs to Upgrade the Operation and Maintenance of the Project

H.13.1 High Rock Development

High Rock Development was the third of the Project developments to be built. The turbines for Units 1, 2 and 3 were put in service in 1927. There have been no upgrades to the original Units under the existing license. The Unit 1 generator was rewound in 1988. Other available structural/maintenance records are summarized below:

- At the time of the original construction, the embankments were not riprapped at locations adjacent to the shallow bodies of reservoir water. However, after the reservoir was filled, it was found that sufficient wave action existed to erode the embankments. These locations were repaired with riprap to prevent further damage.
- In 1954, the elevation of the top intake deck and non-overflow gravity sections was raised to elevation of 638.9 ft. This 1954 concrete was extensively dowelled to the original 1927 concrete. Along with increasing the height, the thickness of the no-overflow sections as well as portions of the intake/powerhouse (service and unloading bay) was also increased.
- Based on a review of underwater diving inspections and tailrace investigations, there is evidence of scour of the spillway and powerhouse. Repairs have been made multiple times (1961, 1993, and 1996) in the past to maintain the powerhouse and spillway in good condition.
- During a dive inspection in 1983, an area of undermining was located at the southwest corner of the powerhouse and repaired using grout bags as formwork, and then grouting behind the grout bags to simply fill the remaining voids. The area was repaired again in 1996/1997 by first removing the grout bags and then installing reinforcing bars, dowels and grout.
- The stability analysis of the High Rock Dam was subsequently updated to meet the FERC requirements, including stability under probable maximum flood (PMF) loading. The results of the analyses indicated that spillway bays 1-10 required remediation. Remediation of the spillway bays at High Rock consisted of installing 20 multi-strand,

epoxy coated and filled post-tension anchors. Construction activities began in September 1999 and work was completed in 2001.

- The hoist cables for all ten Stoney gates were replaced between September and November 2003. The replacements were made to maintain the gate lifting devices in good condition.

H.13.2 Tuckertown Development

Tuckertown Development was the fourth of the Project developments to be built. The turbines for Units 1, 2 and 3 were put in service in 1962. There have been no upgrades or modifications to the original Units under the existing license. There were no major structural or maintenance activities performed at the Tuckertown Development under the current license term.

H.13.3 Narrows Development

Narrows Development was the first of the Project developments to be built. The turbines for Units 1, 2 and 3 were put in service in 1917, and Unit 4 went on line in 1924. The present runners were installed in Unit 1 in 1988, Unit 2 in 1964, Unit 3 in 1996 and Unit 4 in 2001. The original generators for Units 1 and 2 were installed in 1917. The original generators for Units 3 and 4 were installed in 1923 and 1924, respectively, and rebuilt in 1947 and 1946, respectively. A new generator was installed in Units 1 and 2 in 1964. Units 1 and 2 were rewound and rotor poles reinsulated in 1997. An upgrade of Unit 3 was completed in 1996, and an upgrade of Narrows Unit 4 was completed in 2001 and the upgrade of Narrows Unit 2 is anticipated to be completed in 2008. Other available structural/maintenance records are summarized below:

- The bypass spillway was originally constructed as an open excavation cut through the rock, approximately 115 ft wide, 1,100 ft long, the depth varying with the contour of the hillside. For a distance of approximately 130 ft downstream of the flood gates the bottom and sides of the bypass channel were lined with concrete. During July 1919 high flood waters were discharged through the dam. The flood waters were discharged through the bypass spillway depositing rock and other debris in the main channel below the powerhouse, which affected the operation of the turbines. As a result, a channel was constructed and a crib built so that the discharge from the bypass spillway would be carried further downstream before it merged with the main river stream below the powerhouse. The chute was further extended and extensive repairs were made in 1923 to prevent further erosion and the washing of materials into the river downstream of the powerhouse.
- A rock reef located about 1,200 ft below the powerhouse was removed during 1922. This rock reef also hindered the free flow of water from the tailrace and was thought to affect the turbine efficiency. During subsequent flood events, it was found that the rock crib erected in 1919 was not of sufficient length to provide the necessary protection for keeping wash material and debris from entering the tailrace area. In addition, it was noted that the bottom and sides of the channel excavated in the rock were severally damaged and extensive repairs would be necessary to prevent further erosion. Before this work had begun, a model of the bypass spillway, true to scale, was constructed so that the action of the water could be

observed on the proposed repairs. The repair work consisted of excavating the rock so that a solid foundation of concrete could be placed on the bottom and sides, which had not been originally concreted. Also, floods passing over the east end of the main dam spillway washed out areas of the protecting rock ledge in the river between the toe of the dam and the powerhouse. To prevent further damage in this area an armor coating of concrete was installed. Hardaway Contracting Company was given the contract for this work in July 1923 and the work was completed in 1925.

- During 1925, flood water passing over the main dam spillway washed loose rock into the tailrace area to such an extent that the debris interfered with the efficiency of the turbines. This material was removed from the river by the Hardaway Contracting Company.
- A 2-foot steel extension was installed on the gates in 1918, thereby increasing the height of the gates approximately 2 ft.
- As a result of seepage observed flowing from the bottom of the inter-gallery drains A-1, A-2 and A-3 in gallery "A" within the intake section, an exploratory drilling and grouting program was performed in 1986 to identify and control the seepage. A total of eight holes were drilled from the piers into the concrete to seek out and identify seepage paths, and to permit grout injection for sealing purposes. In addition, surface repairs were carried out within Penstock Nos. 3 and 4, which included the removal of spalled and cracked concrete, the installation of new concrete and the patching of voids at the steel liner transition area. Inter-gallery Drains A-1, A-2, and A-3 were drilled and cleared of obstructions to restore them to useful function.
- The main spillway deck consists of an integral concrete slab and beam support system spanning between spillway piers. The deck over the trash gate section that is adjacent to the intake is 6 inches thick with no support steel. No expansion joints were included in the original design of the spillway deck. Visual inspections showed abrasion of the concrete in an arc on the right pier side of each gate (viewed looking in the downstream direction) along a path which the gates travel when opened. Normal thermal conditions combined with the lack of expansion joints caused the trash gate deck slab, adjacent to the intake, to buckle in the early 1990s. The first four pier caps adjacent to the trash gate deck slab separated from the piers and translated approximately 1 inch towards the intake structure. Full-open gate testing performed in 2001 showed gate binding prior to the full opening at nine of the Tainter gates. A two-phase remediation program was established to allow the Tainter gates to be fully opened. The initial phase of remediation activities included the cutting of one slot in the spillway deck at the right non-overflow section and Pier No. 1, and six sets of slots, one set each in Pier Nos. 5, 7, 11, 15, 19 and 21 in 2002. The initial phase of the work was completed in October 2002. The second phase of the remediation effort involved the remediation of the gates themselves, and was initiated in August 2003 and was completed in early 2004.

H.13.4 Falls Development

Falls Development was the second of the Project developments to be built. The turbines for Units 1 and 2 were put in service in 1919, and Unit 3 went on line in 1922. Since that time, both Units 2 and 3 have required realignment to correct runner clearance problems (runner began to rub against its discharge ring resulting in the need to realign the unit) on about a 10 year cycle. Unit 1 has experienced similar though somewhat less severe runner clearance problems with the initial runner clearance problems surfacing in the mid 1930s. The difficulties associated with the vertical alignment of the units led to extensive rehabilitation efforts. Alignment adjustment was no longer possible for Units 2 and 3 in 1961, and the turbine-generators were removed and upgraded in 1962. A similar replacement/upgrade was performed on Unit 1 in 1981. The rehabilitation of all three units included the removal and replacement of mass concrete from the powerhouse floor down to just below the stay ring for each of the three units. The concrete piers between the units, and the east (downstream) and north (river side) walls remained in place. Following the rehabilitation efforts there has been no significant trends in the runner clearance measurements since the Unit 1 replacement in 1981 and small progressive movement towards the downstream-river corner of the powerhouse at Units 2 and 3 since their replacement in 1961. Subsequent to the major upgrade, the turbine-generator alignments have been less frequent.

Additionally, a 2-foot extension consisting of wooden boards was installed on the gates in 1923, thereby increasing the height of the gates approximately 2 ft. In 1929, the 2-foot wooden extensions were replaced by 2-foot steel extensions. In 1946, the 2-foot steel extensions were increased to 4 ft.

H.14 Summary of Unscheduled Outages Over the Last Five Years

Table H.14-1 presents a summary of unscheduled outages over the last five years, including the cause of the outage, the duration of the outage, and the corrective action taken.

Table H.14-1: Summary of Unscheduled Outages Over the Last Five Years

Generating Unit	Date	Cause	Duration (hours)	Corrective Action
Tuckertown #3	3/2000	Field ground	19.2	Cleaned slip rings
High Rock #1	8/2001	Low governor air pressure	16.0	Replaced leaking air valve
Tuckertown #3	8/2001	Turbine lube flow switch	78.4	Replaced flow switch
Falls #3	8/10/2001	Governor trouble	20.6	Replaced LVDT
Falls #3	9/2/2001	Intake gate operating hoist	315.5	Rebuilt gear boxes
Tuckertown #3	1/16/2003	86E Stator ground	11.1	Tested windings no ground
Narrows #1	1/6/2003	86N Governor trouble	10.6	Repaired governor
Falls #1	2/23/2003	Tree in transmission line	9.5	Removed tree and repaired line
Falls #2	2/23/2003	Tree in transmission line	9.5	Removed tree and repaired line
Falls #3	2/23/2003	Tree in transmission line	10.9	Removed tree and repaired line
Tuckertown #2	5/9/2003	86N governor controller	13.7	Repaired controller processor
Narrows #2	8/28/2003	86E & 86N Breaker bushing field	89.1	Replaced bushing
Falls #2	8/27/2003	86N governor trouble	32.2	Repaired governor
Falls #1	10/28/2003	Governor trouble	23.5	Repaired governor
Tuckertown #3	12/30/2004	Turbine pit sump level high	17.5	Repaired sump pump float
Narrows #3	12/30/2004	DC ground, turbine bearing oil flow	39	Repaired DC lube pump
High Rock #3	4/4/2005	Generator Breaker	12.3	Repaired Gen. Bkr.

H.15 Licensee's Record of Compliance

APGI has an excellent record of compliance with the terms of the existing license. Complaints to FERC alleging non-compliance have all be resolved in APGI's favor.

H.16 Project Actions Affecting the Public

H.16.1 Electricity, Recreation, Relicensing

APGI's operation of the Yadkin Project affects the public in a number of ways. One is that a significant portion of the electricity currently generated by the Project is being sold to utilities that serve the public. Second, the Project reservoirs provide many recreational benefits to the public, as well as, surrounding property owners (operating guides that are designed to allow higher water levels during the summer recreation season, a private access permitting program, etc.), including numerous, well-maintained public recreation facilities on Project waters, which

allow hunting, picnicking, boating access, fishing, swimming, and other water-based recreation. In addition, other similar facilities are owned or managed by surrounding counties, the State of North Carolina, or the USFS. Third, the Project is operated in a manner consistent with APGI's strong environmental stewardship values. For example, for many years, APGI has voluntarily worked with agencies and others to enhance fisheries and wildlife resources. Finally, for its relicensing of the Yadkin Project, APGI chose to use a Communications-Enhanced Process that allowed numerous opportunities for issue identification and open communication with interested parties, including the general public, beyond those offered by the traditional relicensing process.

H.16.2 County Economic Impacts Study

During the initial consultation phase of the relicensing process, APGI was requested to evaluate the relationship of the Project reservoirs to the economies of the surrounding five counties, under current reservoir operations and other alternative water level scenarios. In response to this request, APGI undertook a study titled County Economic Impacts of APGI's Yadkin Project (County Economic Impacts Study²) which was carried out in accordance with a study plan that was developed in close consultation with the County Economic Impacts Issue Advisory Group (Appendix H-1).

The overall objective of the County Economic Impacts Study was to document and analyze the relationship of the Project reservoirs to the economies of the surrounding five counties, under current reservoir operations and other alternative water level scenarios. The study also characterized tourism expenditures and opportunities at baseline and under alternative water level scenarios. The study also combined the results of the Recreation Economic Impact Study (see Appendix E-20) with the findings from the County Economic Impacts Study to present a comprehensive report on the impacts of alternative water level scenarios on the counties' economies.

Reservoir Management Scenarios

APGI defined three reservoir management scenarios for High Rock Reservoir to represent the potential range of management options which could be compared to existing reservoir management conditions. Scenario 1 would maintain water levels within 3 ft of full pool year round. Scenario 2 would allow water levels to vary over the same range as they currently do, but would extend the relatively full pool conditions six weeks earlier in the spring and six weeks later in the fall. Scenario 3 would maintain lower water levels during the summer recreation season and would allow water levels to fall farther in the winter than they currently do (see Figure E-9). Table H.16-1 summarizes the impacts of these scenarios on businesses and property values in the two counties adjacent to High Rock Reservoir. The following sections describe how these impacts were estimated.

² Heller, Katherine, Laurel Clayton, and Wanda Throneburg. RTI International. 2005. County Economic Impacts of APGI's Yadkin Project Final Report. December 2005. (Appendix H-1)

Table H.16-1: Estimated Impacts of Alternative Water Level Management Scenarios for High Rock Reservoir on Businesses and Property Values in Adjacent Counties

Annual Business Impacts	Estimated Total Annual Change in Revenues for Directly Affected Businesses					
	Alternative 1		Alternative 2		Alternative 3	
	Low	High	Low	High	Low	High
Total direct impacts	\$3,397,000	\$6,802,000	\$678,000	\$3,397,000	- \$6,802,000	- \$33,964,000
Estimated Economy-Wide Annual Impacts						
Regional Economic Impacts	Alternative 1		Alternative 2		Alternative 3	
	Low	High	Low	High	Low	High
	Davidson County	\$3,475,000	\$6,964,000	\$695,000	\$3,475,000	- \$6,964,000
Rowan County	\$922,000	\$1,847,000	\$182,000	\$922,000	- \$1,847,000	-\$9,238,000
Five County Region	\$4,479,000	\$8,883,000	\$885,000	\$4,443,000	- \$8,883,000	- \$44,398,000
Property Value Impacts	Estimated Home Sales Prices at Baseline and Under Alternative Water Level Management Scenarios					
	Historical	Alternative 1		Alternative 2	Alternative 3	
	Distance from shoreline	12' range	3' range		10' range	20' range
Rowan County						
Homes <0.05 miles	\$136,700	\$167,500		\$143,500	\$109,300	
Homes between 0.05 and 0.5 miles	\$137,300	\$146,900		\$139,400	\$128,800	
Homes >0.05 miles	\$88,200	\$94,300		\$89,500	\$82,711	
Davidson County						
Homes <0.05 miles	\$150,800	\$184,800		\$158,400	\$120,600	
Homes between 0.05 and 0.5 miles	\$129,600	\$138,600		\$131,600	\$121,600	
Homes >0.05 miles	\$106,000	\$113,400		\$107,700	\$99,500	
Property Tax Impacts	Possible Change in Tax Receipts for Homes Within Two Miles of High Rock Reservoir Shoreline					
	No. of Homes	Alternative 1		Alternative 2	Alternative 3	
	Rowan County	2,623	\$219,800		\$48,100	-\$195,800
Davidson County	1,451	\$133,200		\$29,800	-\$118,200	

Impacts on Reservoir-Related Businesses

Many types of businesses rely to some extent on the Yadkin Project reservoirs for their business. APCI's County Economic Impacts Study (Appendix H-1) looked at an exhaustive list of businesses compiled from a variety of sources, and worked with APCI and others to narrow the list for detailed study to those businesses whose major source of revenue was thought to be related to the reservoirs; the study termed these "Priority A" businesses. The study's authors contacted the businesses for a preliminary interview; then, after the Reservoir Management Scenarios were defined, they contacted them again to ask about the impacts of the water levels specified in the Scenarios. The study used their responses to estimate percentage impacts on revenues; to preserve confidentiality, county-level North American Industry Classification System (NAICS) code data was used as the basis for estimating impacts under "low" and "high" impact measures based on the interview findings.

The study found that most businesses would benefit from Scenarios 1 and 2 and would be hurt by Scenario 3. Impacts on directly affected industries ranged from a gain of more than \$6 million in annual industry revenues in Rowan and Davidson counties for high impacts under Scenario 1 to a loss of more than \$33 million for high impacts under Scenario 3. Using the U.S. Forest Service's IMPACT analysis for PLANning (IMPLAN) regional input-output model to estimate impacts throughout the economy of the five-county region that would result from these direct impacts, the study found that Scenario 1 may increase output in the region by as much as \$8.9 million per year under the high impact estimate, Scenario 2 may increase output in the region by as much as \$4.4 million per year, and Scenario 3 may reduce output and spending in the region by as much as \$44.4 million per year. These region-wide impacts include the direct impacts plus changes in spending by directly affected businesses, plus changes in consumer spending that result from changes in owners' and employees' incomes. While gains or losses for individual businesses could be substantial, overall these totals represent relatively small impacts on the regional economy (at most a gain of less than 0.1 percent or a loss of less than 0.4 percent of the total sales or revenues for businesses in the five-county region).

Impacts on Property Values

To address the question of how the value of residential property close to a reservoir is affected by reservoir water level management, APCI's County Economic Impacts Study (Appendix H-1) used a statistical analysis using the hedonic method. The hedonic method is a multiple regression technique that allows for the isolation of the effect of individual characteristics of a home and its environment on its sale value. The study collected data on water levels, and residential property characteristics and sales values for homes within two miles of the shorelines, for two Yadkin project reservoirs (High Rock and Narrows/Badin) and six others in North Carolina and South Carolina.

The analysis found that proximity to a reservoir enhances sales values. For homes within 0.05 mile of shore, sales prices were more than twice the values for comparable residences elsewhere; the impact of the reservoir declines with distance and is insignificant beyond a half mile from shore. Reservoir management affects the proximity premium, especially for shoreline residences. Using home sales in Rowan County and Davidson County, the study estimated that

Scenario 1 would increase sales prices of Rowan County properties within 0.05 miles of the High Rock Reservoir shore by about \$31,000, and homes between 0.05 and 0.5 miles from shore by about \$7,000. Scenario 3, on the other hand, is estimated to reduce sales prices of shoreline properties by about \$27,000 and to reduce sales prices for other nearby properties by about \$5,000. In Davidson County, Scenario 1 is estimated to increase sales prices of properties within 0.05 miles of the High Rock Reservoir shore by about \$34,000, and homes between 0.05 and 0.5 miles from the shore would see an increase of \$8,000. Scenario 3 would reduce sales prices for shoreline properties by \$30,000 and would reduce the sales prices for other nearby properties by about \$7,000.

Possible changes in county property tax receipts were estimated by assuming that all the properties within 2 miles of the shoreline were revalued as predicted by the hedonic model, then applying 2004 tax rates to the changed values. If all 2,623 residential properties located in Rowan County within 2 miles of the High Rock Reservoir shoreline experienced the predicted changes in value, under Alternative 1 property tax receipts could increase by nearly \$220,000; under Alternative 2, they could increase by about \$48,000; and under Alternative 3, they could decline by about \$196,000. In Davidson County, if all 1,451 residential properties experienced predicted changes in value, tax receipts could increase by about \$133,000 under Alternative 1, increase by about \$30,000 under Alternative 2, and could decrease by about \$118,000 under Alternative 3. These estimates are rough approximations that assume all properties experience predicted changes in value, that assessments are revised to reflect these changes, and that 2004 tax rates apply.

H.17 Reduced Ownership and Operating Expenses if the Project License were Transferred

If APGI did not receive the new license for the Project, its annual operating costs would be reduced by the amount shown in Exhibit D. In this case, APGI would no longer be responsible for Project operation or paying taxes and administrative fees associated with the Project.

H.18 Annual Fees Paid Under Part I of the Federal Power Act

Since the initial licensing of the Project, APGI has paid annual FERC administrative charges as presented in Table H.18-1.

APGI does not pay fees for the use of federal lands within the Project boundary because there are no federal lands within the Project boundary. There are no Indian lands included within the Project boundary.

Table H.18-1: FERC Annual Administrative Charges^a

Fiscal Year	FERC Administrative Charge	Other Federal Agencies Administrative Charge^b	Total Administrative Charge
1994	\$145,849	\$16,217	\$162,066
1995	\$369,566	\$0	\$369,566
1996	\$657,244	\$0	\$657,244
1997	\$360,848	\$51,117	\$411,965
1998	\$342,067	\$35,449	\$377,516
1999	\$364,566	\$69,592	\$434,158
2000	\$310,221	\$84,034	\$394,255
2001	\$335,671	\$23,844	\$359,515
2002	\$341,297	\$92,106	\$433,403
2003	\$306,957	\$0	\$306,957
2004	\$677,030	\$0	\$677,030
2005	\$414,735	\$0	\$414,735

a. All dollars are actual, as of the year identified.

b. There were no known administrative charges paid to other federal agencies.