For Discussion Purposes Only

Hydro Project Maintenance and Emergency Protocol

Nantahala Project No. 2692

Introduction

Under some emergency and equipment failure and maintenance situations, certain license conditions may be impractical to meet or may need to be suspended or modified to avoid taking unnecessary risks. The purpose of this protocol is to define the most likely situations of this type, identify the potentially impacted license conditions and outline the general approach that the Licensee will take to mitigate the impacts to license conditions and to communicate with the resource agencies and affected parties.

Note: Due to the potential variability of these abnormal situations, this protocol is not intended to give an exact step-by-step solution path. It will however provide basic expectations for the Licensee's approach to dealing with the situation. Specific details will vary and will be determined on a case-by-case basis as the protocol is being enacted.

Key Facts and Assumptions

1. Dicks Creek – Dicks Creek will continue to be free-flowing with inflow into the pond formed by Dicks Diversion Dam being equal to the outflow at the base of the dam. No water will be diverted into the penstock at Dicks Diversion Dam.

2. Minimum Flows in Bypass Channels – Assume the new license for this project will include the following requirements for minimum releases from hydro project works into bypass channels to enhance water quality and/or aquatic species habitat (except during periods of low inflow covered by a low inflow protocol):

    a. Nantahala River Bypass
        1) Minimum Flow Valve #1 - Maintain the existing minimum flow valve capable of releasing up to 8 cfs from the Whiteoak Penstock into Dicks Creek to provide flows in the Nantahala River Bypass.

        2) Minimum Flow Valve #2 - Install an additional minimum flow valve capable of releasing up to 8 cfs from the Whiteoak Penstock into Dicks Creek to provide flows in the Nantahala River Bypass.

        3) From the 2 minimum flow valves located on the Whiteoak Penstock, provide a total of the following releases into Dicks Creek to provide flows in the Nantahala River Bypass:

a) From November 1 through May 31, 8 cfs.

b) From June 1 through October 31, 16 cfs.

b. Whiteoak Creek Bypass

1) Whiteoak Diversion Dam - Provide 8 cfs or stream flow, whichever is less, from the Whiteoak Diversion Dam into the Whiteoak Creek Bypass from January 1 through December 31.

3. Normal Generation Releases for Recreation – Assume the new license for this project will include the following requirements for a Normal Generation Schedule to Support Recreation at the Nantahala Powerhouse, with all releases being at or above the Best Efficiency Flow for the Nantahala Hydro Unit:

a. 2nd Monday in March through March 31 – 10:00 am to 3:00 pm, seven days per week

b. April – 10:00 am to 4:00 pm, seven days per week

c. May through Labor Day – 9:00 am to 5:00 pm, seven days per week, plus provide one additional hour to the schedule (i.e. 9:00 am to 6:00 pm) on both the Saturday and Sunday before Memorial Day and Labor Day

d. September after Labor Day – 10:00 am to 4:00 pm Sunday through Friday, 9:00 am to 5:00 pm Saturday

e. October – 10:00 am to 3:00 pm Sunday through Friday and 9:00 am to 5:00 pm Saturday.

4. Other Prescribed Generation Releases – Assume the new license for this project will also include the following requirements for prescribed generation releases in addition to the above Normal Generation Schedule to Support Recreation:

a. Whitewater Races - Provide up to 70 hrs per year of generation releases (all at or above the Best Efficiency Flow for the Nantahala Hydro Unit) to support established National, Southeastern Regional or State Level Whitewater Races. To the maximum practical extent, releases will be integrated with the normal release schedule so that additional release hours beyond the normal release schedule are not needed.

b. Other Special Events – Other non-race requests for special generation releases that require additional generation hours above the total number of hours in any given month in the Normal Generation Schedule to Support Recreation will be handled on a case-by-case basis. To the maximum practical extent, releases will be integrated with the normal release schedule so that additional release hours beyond the normal release schedule are not needed.

5. Bypass Flow Releases for Recreation – Assume the new license for this project will include requirements for scheduled releases from Nantahala Dam into the bypass channel to enhance downstream recreation:

   a. Spring Weekend - Release water for six hours per day for one weekend (Saturday and Sunday) per year, scheduled for the last weekend in April. Target flowrates will be approximately 250 cfs on Saturday and approximately 350 cfs on Sunday. Releases will be timed to reach the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam) at approximately 10:00 am.

   b. Summer Afternoons - Provide four total afternoon releases per year for 3 hrs each at a target flowrate of approximately 250 cfs, scheduled between June 15 and August 31. Releases will be timed to reach the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam) at approximately 4:00 pm.

   c. Fall Weekend - Release water for seven hours per day for one weekend per year, scheduled between September 15 and September 30. Releases will be for seven hours at a target flowrate of approximately 300 cfs on Saturday; and five hours at a target flowrate of approximately 425 cfs and two hours at a target flowrate of approximately 250 cfs on Sunday. Releases will be timed to reach the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam) at approximately 10:00 am.

   d. Target Flowrates - The target flowrates stated above are for flowrates immediately below the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam). Actual release amounts from the Tainter gates need to be large enough that when combined with other tributary and accretion flows, the total is at or above the approximate target flowrates.

6. Normal Operating Range for Lake Levels – Assume the new license for this project will include the following requirements for a Normal Operating Range of lake levels:

Month	Normal Minimum Elevation (ft)	Normal Target Elevation (ft)	Normal Maximum Elevation (ft)
Jan	73	78	83
Feb	76	83	88
Mar	78	88	93
Apr	85	93	98
May	93	97	99.5
Jun	93	97	99.5
Jul	93	97	99.5
Aug	91	96	99.5
Sep	88	93	98
Oct	83	88	93
Nov	78	83	88
Dec	73	78	83

Note: The elevations above are for the 1st day of the month. Elevations for other days of the month can be determined by linear interpolation.

7. Most Likely Situations - the following table identifies the assumed most likely situations when this protocol will be enacted and the license conditions that would most likely be impacted:

		Potentially Impacted License Conditions			
Situation	**Indications**	**Min. Flows in Bypass Channels**	**Generation Releases for Recreation**	**Normal Operating Range for Lake Levels**	**Tainter Gate Releases for Recreation**
Hydro Unit Outage	Maintenance will require hydro unit shutdown.		X	X	
Outage of Whiteoak Penstock or Diversion Dam	Maintenance will require partial or full dewatering of the Whiteoak Penstock or interruption of scheduled continuous minimum releases from Whiteoak Diversion Dam	X			
Outage of Tainter Gates at	Maintenance will require rendering one or more			X	X

		Potentially Impacted License Conditions			
Situation	**Indications**	**Min. Flows in Bypass Channels**	**Generation Releases for Recreation**	**Normal Operating Range for Lake Levels**	**Tainter Gate Releases for Recreation**
Nantahala Dam	Tainter gates inoperable.				
Dam Safety Emergency	Condition A or B (i.e. Nantahala Dam failure has occurred, is imminent or a potentially hazardous situation exists) is declared per Emergency Action Plan or other dam safety concern is identified.	X	X	X	X
Voltage or Capacity Emergency	Voltage or capacity conditions on the electric grid in the DPNA system or the larger regional electric grid cause instability and electric system failure has occurred or is imminent.	X		X	X

8. Returning to Normal - All of the above situations can impact the Licensee's ability to operate the hydro project in its most efficient and safest manner for power production. The Licensee will therefore endeavor in good faith to repair existing hydro project equipment and facilities and return them to service within a reasonable period of time, commensurate with the severity of the equipment / facility repair requirements and provided that the repairs are economically justified and funds are available for the repairs.

9. Incidental Outages – outages of hydro project works that are very brief in nature or that require minimal if any deviation from normal license conditions. For the purposes of this protocol, outages of 48 hrs or less duration or that do not require deviation from any license conditions related to minimum flows in bypass channels, flow releases for whitewater recreation or the Normal Operating Range for lake levels are considered Incidental Outages and are exempt from the requirements of this protocol.

10. Notification Guidance

    a. Planned Maintenance - once a likely maintenance schedule has been established, the Licensee will endeavor in good faith to provide as much advance notice as possible to the affected parties identified in this protocol.

    b. Unplanned Maintenance and Emergencies - it is not possible for the Licensee to assure any level of advance notice. For these situations, the Licensee will endeavor in good faith to inform the affected parties identified in this protocol within some reasonable amount of time after the situation has been stabilized.

11. Preparation for High Flow Events – With modern forecasting, it is more possible than ever to see large precipitation events coming and to increase generation hours to reduce lake levels in order to mitigate the potential for spilling and downstream flooding. Typically, this type of advance action is taken from 1 to 5 days before the expected arrival of the storm. It is assumed that the Normal Operating Range of lake levels will include adequate flexibility (i.e. band width) to allow for this type of lake level reduction. If the final Normal Operating Range for lake levels does not provide adequate flexibility, this protocol will be revised to account for the high flow event preparation situation.

12. Relationship Between this Protocol and the Low Inflow Protocol – The Low Inflow Protocol (LIP) provides for reductions in generation flows, minimum flows and recreation flow releases in bypasses and modification of the Normal Operating Range for lake levels when water demands on Nantahala Lake substantially exceed its net inflow. Except for an outage of the Whiteoak Penstock or Diversion Dam or a stuck-open Tainter gate on Nantahala Dam, lowering levels of Nantahala Lake caused by situations addressed under this Hydro Project Maintenance & Emergency Protocol (HPMEP) will not invoke implementation of the LIP. Also, if the LIP has already been implemented at the time that a situation covered by this HPMEP is initiated, the Licensee will typically suspend implementation of the LIP until the HPMEP situation has been eliminated. The Licensee may however choose to continue with the LIP if desirable.

13. Peak Recreation Season – the portion of the year when boating and fishing levels are at their highest. For the purposes of this protocol, this season is defined as April through October.

14. Critical Commercial Whitewater Recreation Periods – the portions of the Peak Recreation Season that have the highest impact on the commercial whitewater industry that depends on the hydro project. Loss of

whitewater recreation flows for the duration of any of these periods could damage the stability of the whitewater recreation businesses that serve the area. For the purposes of this protocol, these periods are defined as (1) any weekend period (Saturday and Sunday plus any holidays that fall on Friday or Monday) between 9 am and 5 pm from Memorial Day weekend through September, (2) any period of 7 or more consecutive days from June through September, (3) any period between 9 am and 5 pm from July 1 through August 15.

15. Critical Flow Period for Stream Fish – the portion of the year when fish in the streams affected by the hydro project most need minimum flows or can be most impacted by higher temperature water releases from the Tainter gates at Nantahala Dam. For the purposes of this protocol, the Critical Flow Period for Stream Fish is defined as June 1 through October 31.

16. Threshold Minimum Flows – the minimum flow release amounts from hydro project works that may be necessary to sustain aquatic communities consistent with the resource management goals and objectives for the affected stream reaches. Since the normal minimum flow releases are for water quality and / or aquatic species habitat enhancements, the Threshold Minimum Flows are related to and lower than the normal minimum flow releases required by the FERC license. For the purposes of this protocol, it is assumed that the Threshold Minimum Flows are as follows:

    a. Whiteoak Creek Bypass - 2 cfs or inflow into Whiteoak Pond, whichever is less, released from Whiteoak Diversion Dam into the Whiteoak Creek Bypass.

    b. Nantahala River Bypass – The following combined flowrates released from the two Spill Valves on the Whiteoak Penstock:

        1) From November 1 through May 31 – 2 cfs
        2) From June 1 through October 31 – 5 cfs.

17. Organizational abbreviations include the NC Division of Water Resources (NCDWR), NC Wildlife Resources Commission (NCWRC), United States Forest Service (USFS), United States Fish & Wildlife Service (USFWS), NC State Historic Preservation Office (NCSHPO), the Eastern Band of the Cherokee Indians (EBCI), the Nantahala Gorge Association (NGA), United States Geologic Survey (USGS) and the American Whitewater Affiliation (AW).

18. Voltage and Capacity Emergencies – The electric transmission system serving the project area is the Duke Power-Nantahala Area (DPNA) system. The DPNA system is connected to the larger regional electric grid by: (a) Santeetlah 161 kV line connecting to the Tennessee Valley Authority (TVA) system and (b) two, 230 kV lines connecting to the Duke Power system near Lake Jocassee. If any one of these three electric transmission lines fails or if a major interruption within the DPNA system occurs, the entire DPNA system can become unstable due to inadequate capacity or voltage to support system demands. The result can include brown-outs or black-outs of large blocks of electric customers served by the DPNA system. Also, since the Licensee's hydro stations are the only electric generation sources that are directly tied to the DPNA system and they do not produce enough electric capacity to meet the DPNA system's instantaneous load, transmission system failures and overloads on the larger regional electric grid can also cause brown-outs and black-outs within the DPNA system. Therefore, for the purposes of this protocol, a voltage or capacity emergency shall exist when any of the following occur:

    a. The Santeetlah 161 kV line connecting the DPNA system to the TVA system is out of service
    b. Either of the two, 230 kV lines connecting the DPNA system to the Duke Power system is out of service
    c. The DPNA system has been split by an internal system failure
    d. A voltage or capacity emergency is declared by Duke Power's System Operating Center or Transmission Operating Center.

19. Safety and Electric System Integrity are of Utmost Importance – Nothing in this protocol will limit the Licensee's ability to take any and all lawful actions necessary at its hydro projects to protect human health and safety, protect its equipment from major damage and ensure the stability of the regional electric grid. It is recognized that the Licensee may take the steps that are necessary to protect these things without prior consultation or notification.

General Approach to Abnormal Situations

A. Hydro Unit Outages

1. Mitigating Actions
   a. Planned Unit Outages
      1) Scheduling - To the extent practical, the Licensee will avoid scheduling unit outages during the Peak Recreation Season (which also includes the Critical Flow Period for Stream Fish and the Critical Commercial Whitewater Recreation Periods), unless it is likely that the equipment condition will cause a forced unit outage if repairs are delayed.

      2) Replacing Generation Recreation Releases – If the outage cannot avoid the Critical Commercial Whitewater Recreation Periods, then the Licensee will endeavor in good faith to replace a portion of the missed generation flows that are normally scheduled for recreation. This can be accomplished by providing at least some releases from the Tainter gates at Nantahala Dam. If replacement releases will be provided from a Tainter gate at Nantahala Dam and the water temperature in Nantahala Lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will:

         a) Avoid scheduling replacement releases for more than two consecutive days.
         b) Monitor temperatures and dissolved oxygen (DO) levels in the Nantahala Bypass during the releases from Nantahala Dam.
         c) Stop the releases if DO levels drop below 5 mg/l (i.e. the instantaneous minimum DO level specified by the NC State Water Quality Standards for trout waters) or if stressed or dead fish are observed.
         d) Replace any aquatic species mortalities that are identified.

      3) Drawing Down Nantahala Lake – To minimize the impacts to its electric customers, the Licensee may choose to draw down Nantahala Lake using the hydro unit to a point where spillage from the dam is expected to be minimized during the outage. If the lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will contract with a licensed archeologist to survey the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002.

4) Augmenting Stream Flow – If the outage impacts generation releases during the Critical Flow Period for Stream Fish, the Licensee will open the sluice gate at the Whiteoak Diversion Dam and allow all the inflow into Whiteoak Pond to flow into the Whiteoak Creek Bypass. This will prevent the excess inflow into Whiteoak Pond from going through the penstocks and tunnels to Nantahala Lake and increase the stream flow in the Nantahala River downstream of its confluence with Whiteoak Creek.

b. Forced Unit Outages

1) Replacing Generation Recreation Releases – If the outage impacts generation releases scheduled for recreation during the Critical Commercial Whitewater Recreation Periods, then the Licensee will endeavor in good faith to replace a portion of the missed generation flows that are normally scheduled for recreation. This can be accomplished by providing at least some releases from the Tainter gates at Nantahala Dam. If replacement releases will be provided from a Tainter gate at Nantahala Dam and the water temperature in Nantahala Lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will:

a) Avoid scheduling replacement releases for more than two consecutive days.
b) Monitor temperatures and dissolved oxygen (DO) levels in the Nantahala Bypass during the releases from Nantahala Dam.
c) Stop the releases if DO levels drop below 5 mg/l (i.e. the instantaneous minimum DO level specified by the NC State Water Quality Standards for trout waters) or if stressed or dead fish are observed.
d) Replace any aquatic species mortalities that are identified.

2) Augmenting Stream Flow – If the outage impacts generation releases during the Critical Flow Period for Stream Fish, the Licensee will open the sluice gate at the Whiteoak Diversion Dam and allow all the inflow into Whiteoak Pond to flow into the Whiteoak Creek Bypass. This will prevent the excess inflow into Whiteoak Pond from going through the penstocks and tunnels to Nantahala Lake and increase the stream flow in the Nantahala River downstream of its confluence with Whiteoak Creek.

2. Communication with Resource Agencies and Affected Parties

a. Planned Unit Outages

1) Direct Consultation - The Licensee will consult with the NCDWR, USFWS, NCWRC, USFS, the NGA President and AW as soon as approximate schedule dates are determined, but at least 10 days prior to beginning the draw down of Nantahala Lake or the unit outage (if a drawdown of the lake

will not be performed). If Nantahala Lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will also consult with the NCSHPO and the EBCI concerning additional archaeological surveys of the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental, cultural and human needs relative to the hydro project.

2) General Notification – At least 10 days before beginning the draw down of Nantahala Lake or the unit outage (if a drawdown of the lake will not be performed), the Licensee will add the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the outage and draw down schedule.

b. Forced Unit Outages

1) Direct Notification - The Licensee will notify the NCDWR, USFWS, NCWRC, USFS, the NGA President and AW as soon as possible after the forced outage begins, but no longer than 5 days afterwards.

2) General Notification – As soon as possible after the forced outage occurs but no longer than 5 days afterwards, the Licensee will add the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the outage and draw down schedule.

3) Direct Consultation – The Licensee will consult with the NCDWR, USFWS, NCWRC, USFS, the NGA President and AW as soon as possible after the forced outage begins, but no longer than 10 days afterwards. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental, cultural and human needs relative to the hydro project.

B. Whiteoak Penstock & Diversion Dam Outages

1. Mitigating Actions

a. Planned Outages

1) Scheduling - To the extent practical, the Licensee will avoid scheduling outages during the Critical Flow Period for Stream Fish, unless it is likely that the equipment condition will cause a forced outage if repairs are delayed.

2) Replacing Lost Minimum Flows in the Bypasses - If the outage cannot avoid impacting minimum flows in bypasses during the Critical Flow Period for Stream Fish, then the Licensee will endeavor in good faith to replace a portion of the missed minimum flows in the affected bypass reaches. This can be accomplished by allowing additional spillage at the Whiteoak Diversion Dam (if the outage will be for Whiteoak Penstock repairs), allowing additional flows through the spill valves that release water from the Whiteoak Penstock to Dicks Creek Bypass (if the outage will be for the sluice gate at Whiteoak Diversion Dam) or by partially opening a Tainter gate at Nantahala Dam.

3) Avoid Falling Below the Threshold Minimum Flows – To the extent practical, the Licensee will avoid falling below any of the Threshold Minimum Flows as noted above. If it is determined that 100% exceedance of the Threshold Minimum Flows cannot reasonably be achieved, the Licensee will work with the resource agencies to (a) monitor any potential aquatic species impacts in the affected stream segments and (b) replace any aquatic species mortalities that are identified.

b. Forced Outages

1) Replacing Lost Minimum Flows in the Bypasses - If the outage cannot avoid impacting minimum flows in bypasses during the Critical Flow Period for Stream Fish, then the Licensee will endeavor in good faith to replace a portion of the missed minimum flows in the affected bypass reaches. This can be accomplished by allowing additional spillage at the Whiteoak Diversion Dam (if the outage will be for Whiteoak Penstock repairs), allowing additional flows through the spill valves that release water from the Whiteoak Penstock to Dicks Creek Bypass (if the outage will be for the sluice gate at Whiteoak Diversion Dam) or by partially opening a Tainter gate at Nantahala Dam. (Note: If minimum flows in bypasses are to be supplemented by partially opening a Tainter gate at Nantahala Dam and the water temperature in Nantahala Lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will complete the Direct Notification of resource agencies identified in item B.2.a below before partially opening a Tainter gate).

2) Avoid Falling Below the Threshold Minimum Flows – To the extent practical, the Licensee will avoid falling below any of the Threshold Minimum Flows as noted above. If it is determined that 100% exceedance of the Threshold Minimum Flows cannot reasonably be achieved, the Licensee will work with the resource agencies to (a) monitor any potential aquatic species impacts in the affected stream segments and (b) replace any aquatic species mortalities that are identified.

2. Communication with Resource Agencies and Affected Parties

   a. Planned Outages

      1) Direct Consultation – The Licensee will consult with the NCDWR, USFWS, NCWRC and the USFS as soon as approximate schedule dates are determined, but at least 10 days prior to beginning the outage. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental and human needs relative to the hydro project.

   b. Forced Outages

      1) Direct Notification - The Licensee will notify the NCDWR, USFWS, NCWRC and the USFS as soon as possible after the forced outage begins, but no longer than 5 days afterwards. If minimum flows in bypasses are to be supplemented by partially opening a Tainter gate at Nantahala Dam and the water temperature in Nantahala Lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will include the following information in the Direct Notification:

         a) The actual measured lake temperature at the depth corresponding to the Tainter gate sill
         b) The approximate total average daily flow in the Nantahala River Bypass just upstream of its confluence with the Nantahala Hydro Power Canal
         c) The approximate continuous release coming from the Whiteoak Diversion Dam
         d) The approximate continuous release coming from the spill valve(s) installed in the Whiteoak Penstock.
         e) The targeted amount of the Tainter gate release.

      2) Direct Consultation – The Licensee will consult with the NCDWR, USFWS, NCWRC and the USFS as soon as possible after the forced outage begins, but no longer than 10 days afterwards. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental and human needs relative to the hydro project.

C. Tainter Gate Outages

1. Mitigating Actions
   a. Planned Outages
      1) Scheduling – To the extent practical, the Licensee will avoid scheduling outages of the Tainter gates that conflict with dates scheduled for Tainter gate releases for whitewater boating in the Nantahala River Bypass, unless it is likely that the equipment condition will cause a forced outage if repairs are delayed.

      2) Replacing Lost Whitewater Releases from the Tainter Gates – If the outage cannot avoid a loss of scheduled whitewater releases from the Tainter gates, then the Licensee will endeavor in good faith to reschedule the releases from the Tainter gates during the current Peak Recreation Season at Nantahala Dam to replace the missed releases that are normally scheduled for recreation.

      3) Drawing Down Nantahala Lake – To minimize the impacts to its electric customers as well as to minimize the risk of performing the work, the Licensee may choose to draw down Nantahala Lake using the hydro unit to a point where spillage from the dam is expected to be minimized during the outage. If the lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will contract with a licensed archeologist to survey the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002.

   b. Forced Outages
      1) Replacing Lost Whitewater Releases from the Tainter Gates – If the outage will cause a loss of scheduled whitewater releases from the Tainter gates, then the Licensee will endeavor in good faith to reschedule the releases from the Tainter gates during the current Peak Recreation Season at Nantahala Dam to replace the missed releases that are normally scheduled for recreation. (Note: If the rescheduled releases will occur during the Critical Flow Period for Stream Fish and the water temperature in Nantahala Lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will complete the Direct Notification of resource agencies identified in item C.2.a below before making the rescheduled Tainter gate release).

      2) Drawing Down Nantahala Lake – To minimize the impacts to its electric customers as well as to minimize the risk of performing the work, the Licensee may choose to draw down Nantahala Lake using the hydro unit to a point where spillage from the dam is expected to be minimized during the

outage. If the lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will contract with a licensed archeologist to survey the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002.

2. Communication with Resource Agencies and Affected Parties

a. Planned Outages

1) Direct Consultation - If the outage will impact scheduled releases from the Tainter gates for whitewater boating in the Nantahala River Bypass, the Licensee will consult with the NCDWR, NCWRC, USFWS, USFS, the President of the NGA and AW as soon as approximate schedule dates are determined, but at least 10 days prior to beginning the outage. If Nantahala Lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will also consult with the NCSHPO and the EBCI concerning additional archaeological surveys of the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental, cultural and human needs relative to the hydro project.

2) General Notification – At least 10 days before beginning an outage that will cause a loss of scheduled whitewater releases from the Tainter gates, the Licensee will add the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the outage and any rescheduled Tainter gate releases for whitewater recreation.

b. Forced Outages

1) Direct Notification - If the outage will impact scheduled releases from the Tainter gates for whitewater boating in the Nantahala River Bypass, the Licensee will notify the NCDWR, USFWS, NCWRC, USFS, the NGA President and AW as soon as possible after the forced outage begins, but no longer than 5 days afterwards. If the rescheduled Tainter gate releases will occur during the Critical Flow Period for Stream Fish and the water temperature in Nantahala Lake at a depth corresponding to the Tainter gate sill is > 20° C, the Licensee will include the following information in the Direct Notification:

a) The actual measured lake temperature at the depth corresponding to the Tainter gate sill

b) The approximate total average daily flow in the Nantahala River Bypass just upstream of its confluence with the Nantahala Hydro Power Canal
c) The approximate continuous release coming from the Whiteoak Diversion Dam
d) The approximate continuous release coming from the spill valve(s) installed in the Whiteoak Penstock
e) The targeted amount (cfs), duration (hrs per day) and number of rescheduled days of the Tainter gate release.

2) General Notification – If the outage will impact scheduled releases from the Tainter gates for whitewater boating in the Nantahala River Bypass, within 5 days following the start of the outage, the Licensee will add the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the outage and any rescheduled Tainter gate releases for whitewater recreation.

3) Direct Consultation - If the outage will impact scheduled releases from the Tainter gates for whitewater boating in the Nantahala River Bypass, the Licensee will consult with the NCDWR, NCWRC, USFWS, USFS, the President of the NGA and AW as soon as possible after the outage occurs, but no longer than 10 days afterwards. If Nantahala Lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will also consult with the NCSHPO and the EBCI concerning additional archaeological surveys of the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the outage on the environmental, cultural and human needs relative to the hydro project.

D. Dam Safety Emergency

1. Mitigating Actions

a. Safety Must Come First – If a Condition A or B is declared per the Licensee's Emergency Action Plan, or other dam safety concerns arise, the Licensee may modify or suspend any license conditions immediately and for as long as necessary to restore the dam to a safe condition.

2. Communication with Resource Agencies and Affected Parties

   a. Direct Notification – Conducted strictly in accordance with the Licensee's Emergency Action Plan. In cases where dam safety concerns arise that are not a Condition A or B per the Licensee's Emergency Action Plan, consultation with resource agencies and affected parties will occur as soon as possible, after the dam safety concern arises.

   b. Once Dam Safety Conditions Have Stabilized – The Licensee will add the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the situation and any expected return to normal operation.

E. Voltage and Capacity Emergencies

1. Mitigating Actions

   a. Suspension of the Normal Operating Range for Lake Levels – If a voltage or capacity emergency (as defined above) occurs, the Licensee may modify or suspend lake level operating limitations immediately and for as long as necessary if doing so would allow additional hydro station operation that is needed to restore the electric grid to a stable condition.

   b. Conserving Water for Power Generation - If a voltage or capacity emergency (as defined above) occurs and if it is expected to continue for an extended period of time (e.g. two weeks or more), the Licensee may reduce minimum flows to the Threshold Minimum Flows (as defined above) and may modify or suspend any scheduled Tainter gate releases to support whitewater recreation in the Nantahala River Bypass if taking those actions is necessary to maintain the water inventory in Nantahala Lake.

   c. Replacing Lost Whitewater Releases from the Tainter Gates – If scheduled whitewater releases from the Tainter gates are lost, then once the emergency is over, the Licensee will endeavor in good faith to reschedule the releases from the Tainter gates during the current Peak Recreation Season at Nantahala Dam to replace the missed releases that are normally scheduled for recreation.

2. Communication with Resource Agencies and Affected Parties

   a. Direct Notification - The Licensee will notify the NCDWR, USFWS, NCWRC and the USFS as soon as possible following a deviation from license conditions for voltage or capacity emergency reasons (add the NGA President and AW if Tainter gate releases for recreational purposes are impacted), but no longer than 5 days afterwards.

   b. General Notification - Within 5 days following the start of the emergency deviation, the Licensee will add the appropriate messages to its public information website and/or its lake level phone system to inform the general public of the situation and any expected dates for return to normal operations.

   c. Direct Consultation – The Licensee will consult with the NCDWR, USFWS, NCWRC and the USFS as soon as possible following a deviation from license conditions for voltage or capacity emergency reasons (add the NGA President and AW if Tainter gate releases for recreational purposes are impacted), but no longer than 10 days following such deviation. The Licensee will consider options suggested by the identified agencies and organizations that could lessen the impact of the emergency on the environmental, cultural and human needs relative to the hydro project.