

FEDERAL POWER COMMISSION
WASHINGTON, D.C. 20426

DSR # 207168
OF PAGES _____

June 6, 1969

Project No. 2685
Power Authority of The State of New York

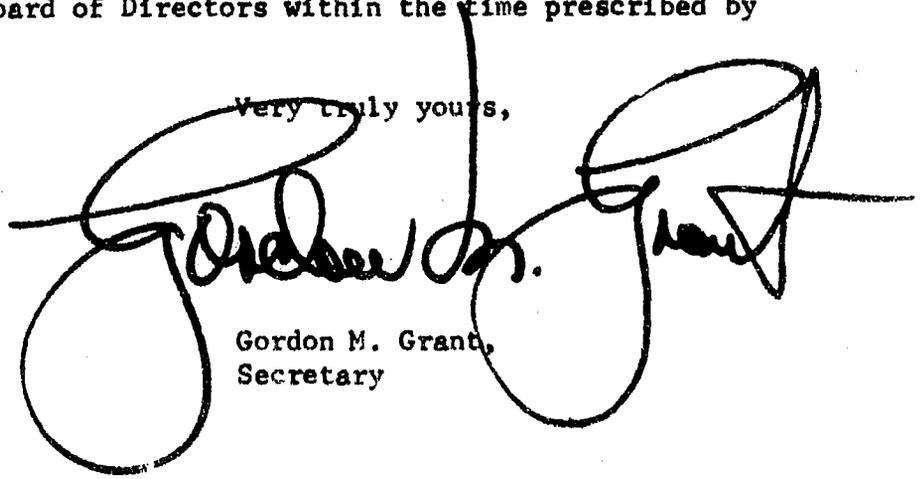
Power Authority of The State of New York
Attention: W. S. Chapin, General Manager
10 Columbus Circle
New York, New York 10019

Gentlemen:

Enclosed are four copies of the order, issuing license (major),
in the above-entitled matter.

Please execute the acknowledgement of acceptance attached to
the order and return three copies of the order, the acceptance, and
resolution of your Board of Directors within the time prescribed by
said order.

Very truly yours,



Gordon M. Grant,
Secretary

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UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

License (Major) - Unconstructed Project - Fish and Wildlife
and Recreation - Preservation and Enhancement of Scenic
Environment

Before Commissioners: Lee C. White, Chairman; L. J. O'Connor, Jr.,
Carl E. Bagge, and John A. Carver, Jr.

Power Authority of the State)
of New York) Project No. 2685

ORDER ISSUING LICENSE (MAJOR)

(Issued June 6, 1969)

Application has been filed on August 15, 1968 and supplemented on September 6 and 12, 1968, and February 4, 1969, by Power Authority of the State of New York (Applicant) of New York, New York, for a license under Section 4(e) of the Federal Power Act (Act) for proposed Project No. 2685, known as the Blenheim-Gilboa Pumped Storage Project, to be located on Schoharie Creek, tributary of the Mohawk River, in the Towns of Gilboa and Blenheim, in Schoharie County, New York. No lands of the United States are affected by the project.

Applicant proposes to construct and operate hydroelectric facilities comprising a closed cycle pumped-storage development having a capacity of 1,000,000 kilowatts to be used for public utility purposes. The project will consist of an upper and lower reservoir, tunnels, powerhouse, substation, switchyard and appurtenant electrical facilities.

The Secretary of the Army and the Chief of Engineers reported that the plans of the project structures affecting navigation are satisfactory insofar as the interests of navigation are concerned, but recommended that any license for the project should include a provision that releases from the lower project during flood periods shall be no greater than flows which would have occurred in the absence of the project - a provision provided for by Article 33 herein.

The Department of the Interior, in reporting on the application, recommended for inclusion in any license for the project the terms and conditions in the interests of fish and wildlife and recreation usually included in licenses for the type of project herein under consideration, and in addition thereto: special conditions in such interests included as (Articles 34 and 36), a special condition to determine the extent of any archeological survey and salvage excavations as may be necessary prior to project construction (Article 37), and a special condition ensuring that project construction activities will not affect adversely the historic Blenheim Bridge over Schoharie Creek downstream from the proposed project and that the overall design program of the project works, including any transmission lines, will be such as to preserve the natural environment of the area (Article 38). Finally, the Department advised that the project is not expected to affect the water quality of the area adversely. Applicant has informed us that it has no objection to any of the Department's recommended license conditions, and has stated that all project facilities have been located, designed or planned to minimize intrusion on the natural beauty of the area and construction will be undertaken in a manner to cause the least possible disturbance. Planting and/or landscaping will be undertaken, where needed, to blend facilities into the natural environs.

Numerous (some 200) written communications have been received from individuals, business firms, recreational associations, municipalities, and political entities, such as the Schoharie County Board of Supervisors, and from the Kiwanis Club of Schoharie County and the area Chambers of Commerce. Some were in favor of the proposed project, such as are the Schoharie Supervisors, the Kiwanis Club and the Chambers of Commerce, among many others, while others expressed their disfavor. We have been informed by Applicant, (letter dated February 3, 1969) that it has acknowledged each letter and has met with top officials of the North American Campers Assn., the National Campers & Hikers Assn., and the National Campground Owners' Assn. who were shown Applicant's plans of the project recreational features, such as campsites, swimming facilities and hiking trails, and at the conclusion of the meetings the representatives of each organization expressed their pleasure and approval since recreational facilities would be increased rather than diminished. One protestor, Mr. Fred Nickerson,

of Gilboa, New York, is the owner of a camping area, a private 220-acre development, part of which, adjacent to the proposed project lower reservoir, would be subject to possible flooding at times. Applicant has advised that of the total of 220 acres of the Nickerson campgrounds, only 14 acres will in any way be affected by the project, and that of the 14, only 4 acres are in the established campground between elevation 900.5 feet and the edge of Schoharie Creek. Of the 4 acres, 2 acres are located in a natural, low area which collects the drainage from a section of the campground. The remaining 2 acres consist mostly of a bank between the edge of the creek and the campsites along the top of the bank. Applicant points out that Schoharie Creek has risen to about 900.5 feet, the maximum elevation of the planned lower reservoir, and, consequently the Nickerson camp property has already experienced the effect of flows as high as those which would occur as a result of Applicant's project. The maximum design elevation of the power reservoir is 900.5 feet and the normal maximum reservoir elevation is 890 feet. Applicant further advises that recently some development work has been undertaken for establishing new campsites within the Nickerson property, located along the bank at the upstream end of the lower reservoir. However, the area, comprising about 10 acres, is also located between elevation 900.5 feet and the edge of the creek. Applicant notes that none of the 10-acre area is presently used for camping.

As a municipal instrumentality, and a political subdivision of the State of New York, Applicant is empowered to acquire by condemnation any property necessary for the project, subject to the payment of just compensation for such taking. In addition, as a licensee under the Federal Power Act, Applicant, under the provisions of Section 21 thereof, may exercise the right of eminent domain to acquire property needed for the project.

According to Exhibit R of the application, being a recreational use plan, initial recreational development is to be constructed by the Authority along with the power facilities and consists of: (1) two overlook areas, one of which has a visitor complex and both of which have hiking trails, parking, picnicking, and sanitary facilities; (2) a fishing access site in the tailwater areas; and (3) a State

Park with camping, swimming, picnicking, sightseeing, boating, fishing, and hiking facilities. Evaluation of the recreational use plan indicates initial development meets current area needs as reflected in the New York State Comprehensive Outdoor Recreation Plan. Future needs will be met by the New York Department of Conservation, on the approximately 1,500 acres of project lands suitable for recreational development under arrangements suitable to both the Department of Conservation and Applicant. Since the initial development meets area needs as reflected in the Statewide Comprehensive Outdoor Recreation Plan, and sufficient lands are available to meet future recreational needs, we are approving the Exhibit R.

While Exhibit S of the application, being a report on the effect, if any, of the project upon fish and wildlife resources in the project area, and proposals for measures necessary to conserve and, if practical, to enhance such resources, suggests fish and wildlife studies and management possibilities, no specific proposals for protecting and developing these resources are included. Therefore, the exhibit does not conform to the Commission's regulations, and we are including in Article 36 a requirement for the filing of a revised Exhibit S.

The most economic alternative to the proposed Blenheim-Gilboa Project as a source of power would be a series of gas-turbine plants installed throughout Applicant's system. The proposed Blenheim-Gilboa Project shows an annual savings of about \$1,700,000 over the gas-turbine alternative. Other alternatives considered, such as oil-fired peaking steam and nuclear plants were found to be more costly than the gas turbines. According to the application, Applicant is authorized to issue negotiable bonds or notes for the purpose of financing any project, including the acquisition of any real or personal property or facilities deemed necessary by Applicant.

Applicant is the sole source of wholesale power supply for the five New York rural electric cooperative systems, financed by the Rural Electrification Administration. It also furnishes power to rural electric systems of Pennsylvania and Vermont with a very

substantial part of their wholesale power supply. In addition, Applicant supplies power to municipalities, and public and private utilities within and without the State of New York.

Sheet 7 of Exhibit L (FPC No. 2685-10) of the application for license shows two underground cables extending from Blenheim-Gilboa powerplant to the adjacent 345 kv switchyard, from which three 345 kv lines extend, one to New York State Electric & Gas Corporation's Delhi substation, the second to Niagara Mohawk Power Corporation's New Scotland substation, and the third to the latter's proposed Leeds substation. According to the overall layout shown on Exhibit J, Sheet 2 (FPC No. 2685-2) of the application, the 345 kv lines will be used as primary project lines to connect to the existing interconnected primary transmission systems of the companies named. Consequently, the three lines are being constructed to satisfy the needs of Project No. 2685 and should be included in the license for the project as parts of the project works. Through the connections at the Delhi, New Scotland and Leeds substations, the Blenheim-Gilboa Project will transmit electric energy to the three named companies' systems which in turn transmit electric energy to and from the States of Massachusetts, New Jersey and Pennsylvania, and Canada, depending upon system demands.

Applicant filed Exhibits J, K, L and M as part of the application for license and stated that Exhibits F and K details are to be filed by amendments to any license for the project following its acquisition of land and land rights. Exhibit J shows the general location of the project, but not the location of the three 345 kv transmission lines which we are finding to be parts of the project works. Exhibit K also should show the routing and rights-of-way of the transmission facilities. The Exhibit L drawings of the final design features and Exhibit M reflecting the mechanical and electrical equipment of the project are subject to review by Applicant's Board of Consultants. While we are approving Exhibits J, K, L and M to the extent that they show the general information and layout of the project, we are by Articles 28, 34 and 35 requiring the filing of Exhibit F and revised Exhibits J, K, L and M.

The Commission finds:

(1) Applicant is a corporate instrumentality, a political subdivision of the State of New York, organized under the laws of the State of New York, and is a municipality within the meaning of Section 3(7) of the Act; and it has submitted satisfactory evidence of compliance with the requirements of all applicable State laws insofar as necessary to effectuate the purposes of a license for the proposed project.

(2) The proposed project will affect the interests of interstate or foreign commerce.

(3) Public notice of the filing of the application has been given. No petition to intervene, or notice of intervention has been filed. Except for the protests hereinbefore mentioned, no protests have been filed. No conflicting application is before the Commission.

(4) Applicant has submitted satisfactory evidence of its financial ability to construct and operate the proposed project.

(5) The estimated annual cost of developing power from the proposed project is less than the estimated annual cost to Applicant of developing alternative sources of power.

(6) The power to be produced by the project is needed to meet the load growth in the service area of Applicant.

(7) The project does not affect a Government dam, nor will the issuance of a license therefor, as hereinafter provided, affect the development of any water resources for public purposes which should be undertaken by the United States.

(8) Subject to the terms and conditions hereinafter imposed, the project will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, and for other beneficial public uses, including recreational purposes.

(9) The installed horsepower capacity of the project hereinafter authorized for the purpose of computing the capacity component of the administrative annual charge is 1,333,000 horsepower, and the amount of annual charges, based on such capacity, to be paid under the license for the project, for the costs of administration of Part I of the Act is reasonable as hereinafter fixed and specified.

(10) The generator leads, the 15/345 kv step-up transformers, the 345 kv lines from the transformers to the adjacent 345 kv switchyard, the 345 kv switchyard, the three 345 kv transmission lines from the switchyard to Delhi, New Scotland and Leeds substations, and the necessary appurtenant electrical equipment, are parts of the project within the meaning of Section 3(11) of the Act and should be included in this license, as hereinafter provided.

(11) The exhibits designated and described in paragraph (B) below conform to the Commission's rules and regulations and should be approved as part of this license to the extent therein indicated.

The Commission orders:

(A) This license is hereby issued to Power Authority of the State of New York (Licensee) of New York, New York, under Section 4(e) of the Federal Power Act (Act) for a period of 50 years effective as of May 1, 1969, for the construction, operation, and maintenance of the proposed Blenheim-Gilboa Pumped Storage Project No. 2685, to be located on Schoharie Creek, a tributary of the Mohawk River, in Schoharie County, New York, subject to the terms and conditions of the Act which is incorporated herein by reference as a part of this license and subject to such rules and regulations as the Commission has issued or prescribed under the provisions of the Act.

(B) The proposed Blenheim-Gilboa Project will consist of:

(i) all lands constituting the project area and enclosed by the project boundary or the licensee's interests in such lands, the limits of which are otherwise defined, the use

and occupancy of which are necessary for the purposes of the project; such project area and project boundary being shown and described by certain exhibits which form part of the application for license and which are designated and described as follows:

Exhibit J: (FPC No. 2685-1) entitled "General Map of Project Area", approved only insofar as it shows the general location of the project.

Exhibit K: (FPC No. 2685-3) entitled "Detail Map of Project Area", approved only insofar as it shows the general location of the project.

(ii) project works consisting of:

- (1) an upper reservoir having earth embankment sections totaling 12,100 feet overall length with maximum height of 110 feet and crest at elevation 2008 feet (m.s.l.) to maintain a normal maximum operating level at elevation 2003 feet (m.s.l.) and having storage capacity of 16,500 acre-feet;
- (2) an ungated, submerged circular-weir inlet; (3) a concrete-lined vertical pressure shaft 1000 feet long, a horizontal tunnel 900 feet long, and the manifold 350 feet long; (4) four steel-lined penstock tunnels 12 feet in diameter, each 2,200 feet long, leading to the pumping-generating plant;
- (5) an outdoor type powerhouse of reinforced concrete housing four pump-turbine motor-generator units, each rated at 250,000 kw with net generating head varying between 1,007 and 1,100 feet; (6) a switchyard, located adjacent to the pumping-generating plant; (7) three 345 kv transmission lines; one to Delhi; one to New Scotland and one to Catskill (Leeds);
- (8) a lower reservoir with 18,500 acre-feet of gross storage capacity formed by a dam across Schoharie Creek downstream of the pumping-generating plant consisting of an earth embankment across the valley with 1,600 feet crest length at a maximum height of 100 feet with crest at elevation 901 feet (m.s.l.); a concrete-lined, side-chute spillway on the west abutment controlled by three 44 x 36 feet taintor gates;
- (9) recreational facilities consisting of a visitor's center area, Mine Kill State Park, an upper reservoir overlook, a fishing access area, and essential electric, water supply and sanitary treatment facilities; and (10) appurtenant

facilities: -- the location, nature and character of which are more specifically shown and described by the exhibits hereinbefore cited and by certain other exhibits which also form part of the application for license and which are designated and described as follows:

<u>Exhibit L</u> <u>Sheet No.</u>	<u>FPC No.</u> <u>2685</u>	<u>Showing</u>
1	-4	Site Plan & Tunnel Profile
2	-5	Powerhouse & Switchyard - Plan & Sections
3	-6	Powerhouse Plan & Sections
4	-7	Dams & Tunnels - Sections & Details
5	-8	Spillway - Plan & Sections
7	-10	Electrical One-Line Diagram
8	-11	Electrical Equipment Plan
9	-12	Electrical Equipment Sections

Exhibit M: consisting of two typewritten sheets entitled "Major Equipment" filed August 15, 1968.

Exhibit R: A report entitled "Recreational Plan" consisting of pages R-1 through R-4 (text) filed August 15, 1968, and Exhibit R Map (FPC No. 2685-13) entitled "Recreation Development Plan", and Consultant's report entitled "Report on Recreation Development Plans," portions approved consisting of: pages 14 through 17 and pages 19 through 35 filed September 6, 1968.

(Note: the Exhibits L and M are approved insofar as they show and describe the general scope of the project)

(iii) all other structures, fixtures, equipment or facilities used or useful in the maintenance and operation of the project or located on the project area, including such portable property as may be used or useful in connection with the project or any part thereof, whether located on or off the project area, if and to the extent that the inclusion of such property as part of the project is approved or acquiesced in by the Commission; also, all riparian or other rights, the use or possession of which is necessary or appropriate in the maintenance or operation of the project.

(C) This license is also subject to the terms and conditions set forth in Form L-11 (Revised November 1, 1968) entitled "Terms and Conditions of License for Unconstructed Major Project Affecting the Interests of Interstate or Foreign Commerce," (FPC) which terms and conditions designated as Articles 1 through 25 except Articles 6, 7, and 8, thereof, are attached hereto and made a part hereof and subject to the following special conditions set forth herein as additional articles.

Article 26. Licensee shall pay to the United States the following annual charge, effective as of May 1, 1969:

For the purpose of reimbursing the United States for the costs of administration of Part I of the Act, a reasonable annual charge as determined by the Commission in accordance with the provisions of its regulations, in effect from time to time. The authorized installed capacity for such purpose is 1,333,000 horsepower.

Article 27. Licensee shall commence construction of the project within two years from the effective date of this license and shall thereafter in good faith and with due diligence prosecute such construction and shall complete construction of such project works within five years from the effective date of the license.

Article 28. Licensee shall submit in accordance with the Commission's rules and regulations revised Exhibit L drawings and Exhibit M showing the final design of the project works; and the Licensee shall not begin construction of the project structures until the Commission has approved such exhibits.

Article 29. Licensee shall retain a board of three or more independent qualified consultants to assess and make recommendations for safety and adequacy, the specifications, design, and construction of the project. Among other things, the board shall assess: the geology of the project site and surroundings, including the bedrock and overburden of the upper reservoir site for their water holding capabilities:

the proposed design, specifications, and construction of the dike embankments, the associated dike instrumentation, drainage systems, and plans for surveillance during test filling and operation; the proposed design, specifications, and the construction of the powerhouse, waterways, electrical and mechanical equipment involved in water control, emergency power supply and other project works; and the construction inspection program. The Licensee shall submit the board's reports to the Commission covering each portion of the project prior to or simultaneously with the submittal of the corresponding revised Exhibit L final design drawings. The Licensee shall also submit the board's final report covering the construction of the entire project, including a schedule for test filling of the upper reservoir, and the Licensee shall receive Commission approval prior to the initial filling of the project's upper reservoir.

Article 30. Licensee shall submit stability analysis of the upper and lower reservoir embankments based on test values of the embankment and foundation materials actually found. These analyses shall be submitted prior to or at the same time as, the submittal of the revised Exhibit L drawings showing the final design of the embankments.

Article 31. Licensee shall submit the results of hydraulic model studies on the intake/discharge structure of the upper reservoir, and the spillway of the lower reservoir, to insure their proper operation.

Article 32. Primary and back-up systems shall be provided to stop the pumping cycle automatically when the upper reservoir water surface reaches elevation 2005 feet or lower. The Licensee shall design the dike facilities for passing inadvertent overpumpage and obtain rights on sufficient property between the dikes and the Schoharie Creek necessary to convey the resulting discharge from the upper reservoir into Schoharie Creek or the lower reservoir.

Article 33. Licensee shall operate the project reservoirs in such a manner that releases from the lower reservoir during flood flows shall be no greater than flows which would have occurred in the absence of the project.

Article 34. Licensee, following consultation with appropriate Federal, State, and local agencies, shall file Exhibit F and for Commission approval prior to construction,

Exhibits J, K and M for the three 345 kv transmission lines required to transmit power between the project switchyard and the aforesaid Delhi, New Scotland, and Leeds substations prepared in accordance with Sections 4.41 and 4.42 of the Commission's rules and regulations and shall submit plans for preservation and enhancement of the environment as it may be affected by the transmission lines design and location. In preparing this plan Licensee shall give appropriate consideration to recognized guidelines for protecting the environment and to beneficial uses, including wildlife, of the transmission lines rights-of-way.

Article 35. Licensee shall within one year after acquisition of the project land, other than for transmission lines, submit an Exhibit F and for Commission approval Revised Exhibits J and K prepared in accordance with Sections 4.41 and 4.42 of the Commission's rules and regulations.

Article 36. Licensee shall consult with appropriate State and Federal agencies and make, or pay the cost of making, studies to determine: the magnitude of existing fish and wildlife populations and how they will be affected by the construction and operation of the project and any measures needed to protect and develop the fish and wildlife resources of the project area. Based upon findings of the studies, Licensee, shall, following consultation with appropriate State and Federal agencies, prepare a revised Exhibit S which shall include, but not be limited to, consideration of (1) provisions for minimum releases from the lower dam to the 5-mile reach of Schoharie Creek immediately downstream, (2) provisions for developing and managing suitable areas, including the Mine Kill area, as replacement habitat for deer winter range without conflicting with general recreational use at the project, (3) provisions for preventing or alleviating any deer migration blocks created by the project, and (4) a schedule for constructing any facilities and making any changes needed in the operation of the project or for management or development for fish and wildlife enhancement or conservation. The revision of the Exhibit S, as well as any amendments to the Exhibit R required by the fish and wildlife management proposals shall be completed and submitted for Commission approval within 1 year from the date of issuance of this license, with the provision that replacement of lost deer winter browse areas shall be completed and ready for use prior to the initial filling of the reservoirs.

Article 37. Licensee shall, prior to the initial construction consult with the Northeast Regional Director, National Park Service, U.S. Department of the Interior, 143 South Third Street, Philadelphia, Pennsylvania 19106, to determine the extent of any archeological survey and salvage excavations that may be necessary prior to any construction activities and provide an amount not to exceed \$1,000 for any needed surveys or salvage excavations to be conducted and completed prior to construction and/or flooding, whichever is applicable.

Article 38. Licensee shall exercise care to insure that project construction activities will not affect adversely the historic, covered Blenheim Bridge and shall minimize any disturbance caused by construction and maintenance of the project works to the scenic values of the area by consulting with the appropriate Federal and State agencies and professional land use planners in developing a plan to blend project works with the natural view, and shall within 9 months of issuance of this license submit for Commission review an architectural rendering showing the plan developed for the major project features including transmission facilities.

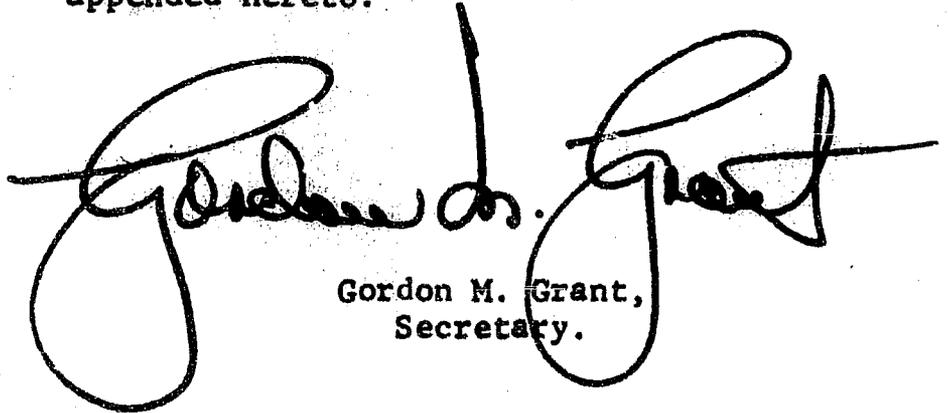
Article 39. Insofar as any material is dredged or excavated in the prosecution of any work authorized under the license, or in the maintenance of the project, such material shall be removed and deposited and borrow areas restored to the satisfaction of the Regional Engineer.

(D) The exhibits designated and described in paragraph (B) above are hereby approved as part of this license to the extent indicated therein.

(E) This order shall become final 30 days from the date of its issuance unless application for rehearing shall be filed as provided in Section 313(a) of the Act, and failure to file such an application shall constitute acceptance of

this license. In acknowledgment of the acceptance of this license, it shall be signed for the Licensee and returned to the Commission within 60 days from the date of issuance of this order.

By the Commission. Commissioner Bagge concurring
(S E A L) filed a separate statement
appended hereto.

A large, stylized handwritten signature in black ink, appearing to read "Gordon M. Grant". The signature is written in a cursive, flowing style with large loops and a long horizontal stroke at the end.

Gordon M. Grant,
Secretary.

IN TESTIMONY of its acknowledgment of acceptance of all of the provisions, terms and conditions of this license, Power Authority of the State of New York, this 17th day of JUNE, 1969, has caused its corporate name to be signed hereto by W. S. CHAPIN, its _____ General Manager, and its corporate seal to be affixed hereto and attested by JOHN C. BRUEL, its _____ Secretary, pursuant to a resolution of its Board of Trustees duly adopted on the 16th day of JUNE, 1969, a certified copy of the record of which is attached hereto.

POWER AUTHORITY OF THE STATE
OF NEW YORK

By W. S. Chapin
General Manager

Attest:

John C. Bruel
Secretary

(Executed in quadruplicate)

THIS IS TO CERTIFY that at a regular meeting of
Power Authority of the State of New York held June 16, 1969
a resolution of which the following is a true and complete copy,
was adopted:

RESOLVED, That the Authority here-
by accepts the license for the Blenheim-
Gilboa Pumped Storage Project, Project
No. 2685, issued by the Federal Power
Commission on June 6, 1969 (effective
May 1, 1969) and all of the provisions,
terms and conditions thereof; and be it
further

RESOLVED, That the General Manager
be authorized and directed to execute the
acceptance of such license and that its
corporate seal be affixed thereto and attested
by the Secretary, and to file three copies of
the Order, the acceptance, and this resolution
with the Federal Power Commission.

THIS IS TO CERTIFY FURTHER that the resolution above
set forth has not been modified, amended or repealed and is in
full force and effect, and that W. S. Chapin is General Manager
of Power Authority of the State of New York.


John C. Bruel
Secretary
Power Authority of the State of New York

Dated: New York, New York
this 17th day of June, 1969.

Power Authority of the State)
of New York

Project No. 2685

BAGGE, Commissioner, concurring:

(Issued June 6, 1969)

I concur in the issuance of the license to the Power Authority of the State of New York in this proceeding. However, I would like to present my view of an appropriate and effective interpretation of Article 34 of the license.

Article 34 provides:

In preparing this plan Licensee shall give appropriate consideration to recognized guidelines for protecting the environment and to beneficial uses, including wildlife, of the transmission lines rights-of-way.

I suggest that the Power Authority of the State of New York, in considering "recognized guidelines for protecting the environment," look to and rely upon the explicit guidelines for the protection of aesthetic and other environmental values set forth in the Report of the Working Committee on Utilities of the President's Council on Recreation and Natural Beauty dated December 27, 1968. A copy of these guidelines is appended to this concurring statement.

Carl E. Bagge

Carl E. Bagge

■ ■

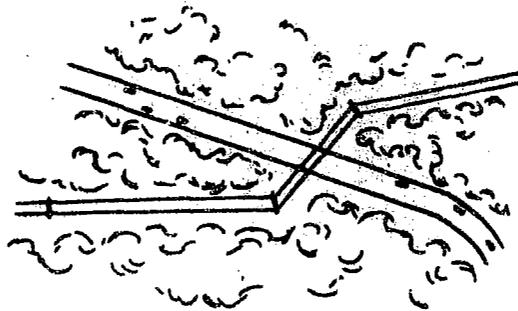
Guidelines for the Protection of Natural, Historic,
Scenic, and Recreational Values in the Design and
Location of Rights-of-Way and Transmission Facilities

The Working Committee on Utilities has found that the form and appearance of transmission facilities can be improved if these facilities are creatively designed and constructed with the imaginative use of colors and materials. Moreover, we have found that even with improved form, the appearance of rights-of-way and transmission facilities can be further improved if they are concealed in part by the natural features of the landscape, such as the existing vegetation and terrain, and newly planted vegetation. The guidelines set forth below have followed from these general findings and are applications of them to the kinds of circumstances frequently confronted by management decision-makers in the selection of rights-of-way routes. They are not simply theories, but are objects to be achieved by practice. It is with this in mind that we strongly urge management to make these guidelines in substance a field manual to govern the planning, locating, clearing and maintenance of rights-of-way and the construction of transmission facilities.

The Selection and Clearing of Rights-of-Way Routes

- Rights-of-way should be selected with the purpose of minimizing conflict between the rights-of-way and present and foreseeable uses of the land on which they are to be located. To this end, existing rights-of-way should be given priority as the locations for additions to existing transmission facilities, and the joint use of existing rights-of-way by different kinds of transmission facilities should be considered.
- Rights-of-way should avoid scenic, recreational and historic areas where possible. If rights-of-way must be routed through scenic, recreational or historic areas, they should be located in corridors least visible from areas of public view.
- Rights-of-way should avoid heavily timbered areas, steep slopes and proximity to main highways where possible.

- Long views of transmission lines perpendicular to highways, down canyons and valleys or up ridges and hills should be avoided. The lines should approach these areas diagonally and should cross them at a slight diagonal.



- Rights-of-way clearings should be kept to the minimum width necessary to prevent interference of trees and other vegetation with the proposed transmission facilities. Trees which would interfere with the proposed transmission facilities and those which could cause damage if fallen should be selectively cut and removed.



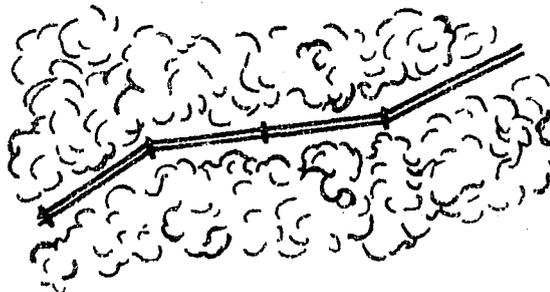
POOR EXAMPLE

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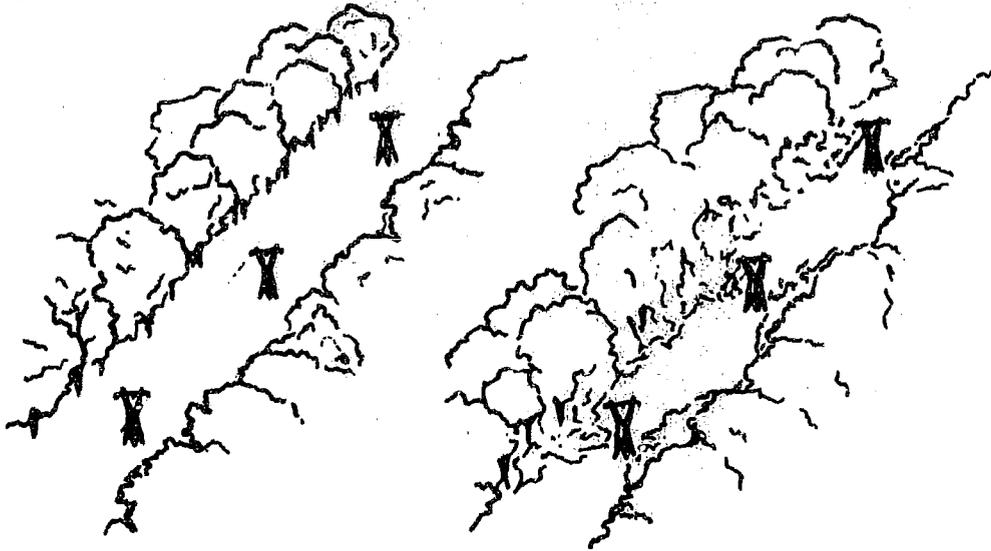
- The time and method of clearing rights-of-way should take into account matters of soil stability, the protection of natural vegetation and the protection of adjacent resources.

- The use of helicopters for the construction on rights-of-way should be considered in mountainous and scenic areas. This would permit rights-of-way to be located in more remote areas and would reduce disturbance of the ground and the number of access roads.
- Trees and other vegetation cleared from rights-of-way in areas of public view should be disposed of without undue delay. If trees and other vegetation are burned, local fire and air pollution regulations should be observed. Unsightly tree stumps which are adjacent to roads and other areas of public view should be cut close to the ground or removed.
- Trees, shrubs, grass and top soil which are not cleared should be protected from damage during construction.
- Rights-of-way should not be cleared to the mineral soil where possible. Where this does occur in scattered areas of the rights-of-way, the top soil should be replaced and stabilized without undue delay by the planting of appropriate species of grass, shrubs and other vegetation which are properly fertilized.
- Soil which has been excavated during construction and not used should be evenly filled back onto the cleared area or removed from the site. The soil should be graded to comport with the terrain and the adjacent land, and the top soil should then be replaced and appropriate vegetation should be planted and fertilized.
- Bulldozing generally should not be done on slopes which exceed 35 percent. Scars on the surface of the ground should be repaired with top soil and replanted with appropriate vegetation.
- Terraces and other erosion control devices should be constructed where necessary to prevent soil erosion on slopes on which rights-of-way are located.
- Where rights-of-way cross streams or other bodies of water, the banks should be stabilized to prevent erosion. Construction on rights-of-way should not damage shorelines, recreational areas or fish and wildlife habitats.

- Replacement of earth adjacent to water crossings should be at slopes less than the normal angle of repose for the soil type involved and sodding or seeding should be accomplished without undue delay.
- Rights-of-way should cross streams or other bodies of water at low lands rather than at high banks or wild areas where possible.
- Blasting should not be done within or near stream channels without adequate protection for fish and other aquatic life.
- The so-called "jacking" technique for laying pipe or cable beneath river beds should be used where approach elevations and soil conditions permit.
- Cofferdam techniques to lay pipe or cable across streams should be used in order to permit full flow in one part of the stream while construction work is being performed in another part.
- Care should be taken to avoid oil spills and other types of pollution while work is performed in streams.
- Water used for pipe testing purposes and taken from streams or other bodies of water should be limited to volumes which will not cause harm to the ecology or aesthetics of the area. When the testing water is released, it should be done at least one-fourth mile from the streams or bodies of water into vegetation on levels upland so as not to cause erosion and siltation.
- Rights-of-way strips through forest and timber areas should be deflected and should follow irregular patterns. This will prevent the rights-of-way from appearing as tunnels cut through the timber.



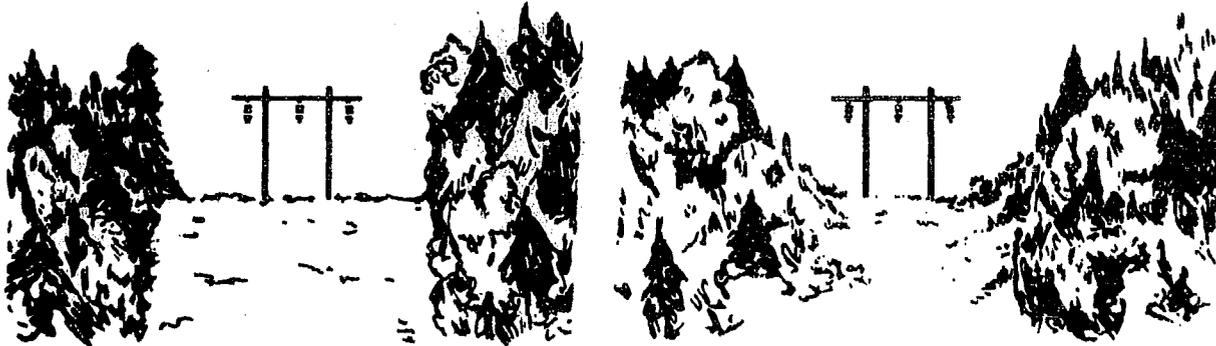
● Rights-of-way strips through forest and timber areas should be cleared with curved, undulating boundaries and trimmed to comport with the topography of the terrain.



POOR EXAMPLE

PREFERRED

● Small trees and plants should be used to feather back the rights-of-way from grass and shrubbery to larger trees.



POOR EXAMPLE

PREFERRED

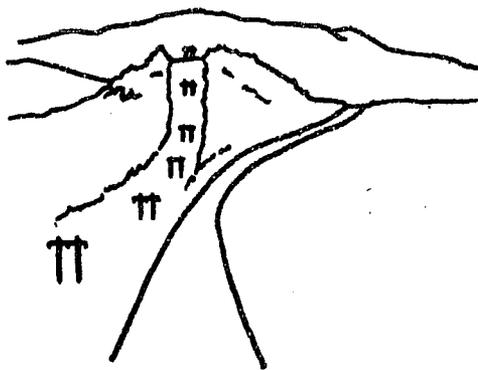
● Where there are several adjacent rights-of-way, low-growing vegetation should be planted between them if possible. Groves of trees should be maintained with lower growing shrubbery on the periphery.



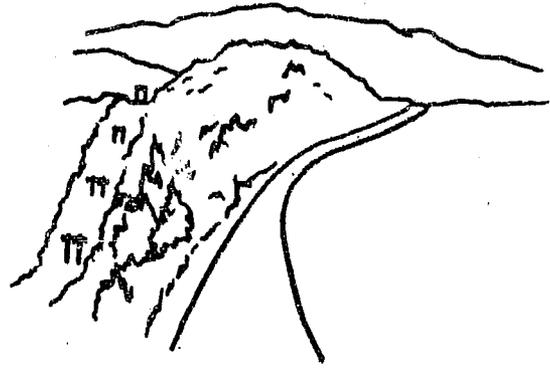
POOR EXAMPLE

PREFERRED

● Rights-of-way should not cross hills and other high points at the crests.



POOR EXAMPLE

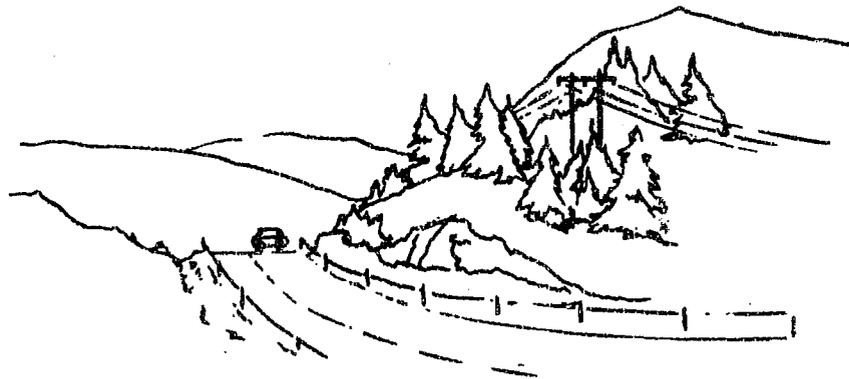


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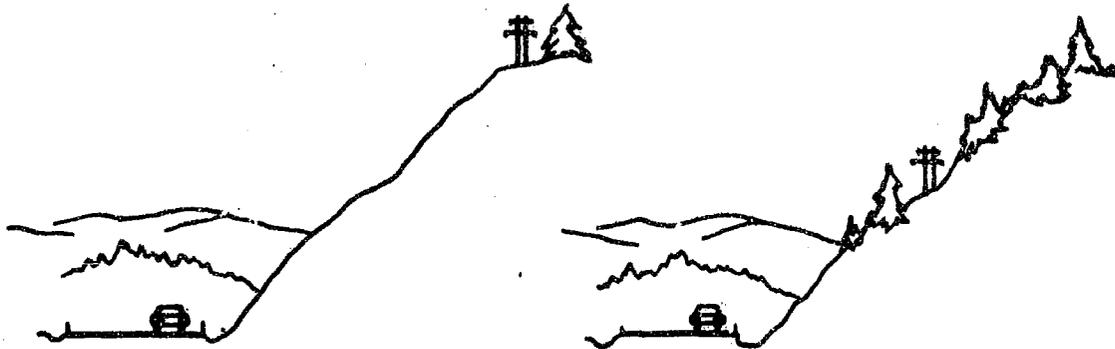
- If underground transmission lines must be located near the crests of hills or other high points, trenching should be done with small equipment in order to minimize the width of the rights-of-way clearings.
- Roads used during construction should be stabilized without undue delay by erosion control measures and the planting of appropriate grass and other vegetation. These roads should be designed for proper drainage, and water bars to control soil erosion should be installed.
- Access roads should not be constructed on unstable slopes. Where feasible, service and access roads should be used jointly.

The Location of Transmission Towers and Overhead Lines

- If an overhead line must be routed across uniquely scenic, recreational or historic areas or rivers, the feasibility of placing the line underground should be considered. If the line must be placed overhead, it should be located on a right-of-way least visible from areas of public view.
- Transmission facilities should be located with a background of topography and natural cover where possible. Vegetation and terrain should be used to screen these facilities from highways and other areas of public view.



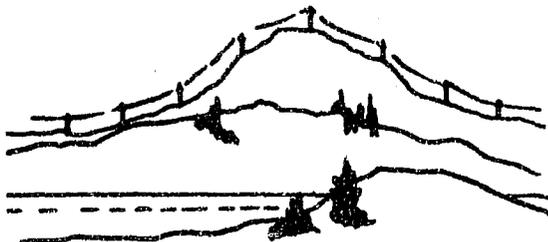
- Where transmission facilities must be placed on slopes which parallel highways or other areas of public view, they should be located approximately two-thirds the distance up the slopes where feasible. With the slopes as background, the presence of the facilities would be less noticeable.



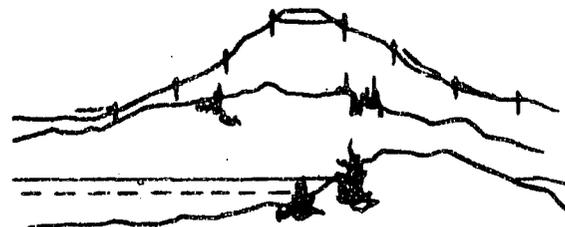
POOR EXAMPLE

PREFERRED

- Transmission line towers which are in areas of public view should not be placed in a straight-line pattern for long distances through forest or timber areas. They should follow an irregular pattern along rights-of-way alignments which have been deflected.
- Transmission line towers should generally follow the contours of the land.
- Transmission facilities should not cross the crests of hills and other high points. To avoid placing a transmission tower at the crest of a ridge or hill, towers should be spaced below the crest to carry the line over the ridge or hill, and the profile of the facilities should not be silhouetted against the sky.

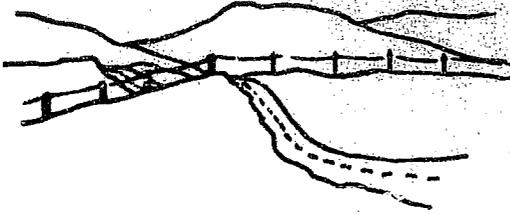


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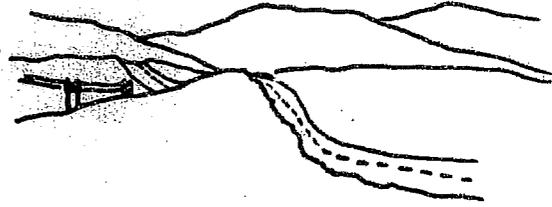


PREFERRED

- Transmission lines should not cross highways at the crest of a road or the bottom of a valley.

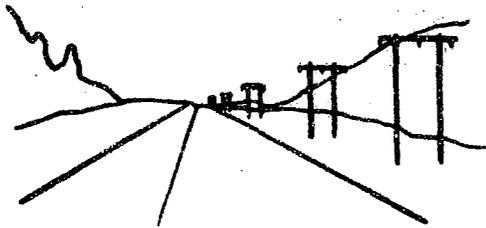


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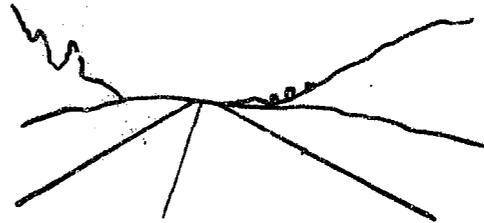


PREFERRED

- Long views of transmission lines parallel to highways should be avoided where possible.

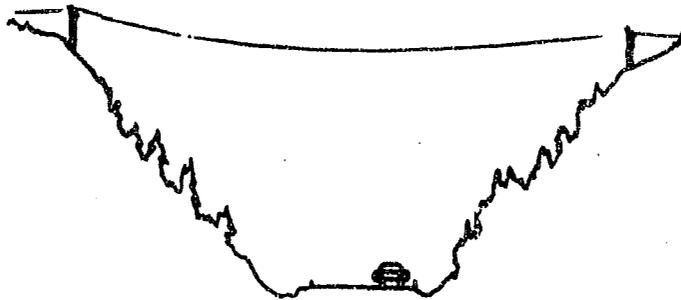


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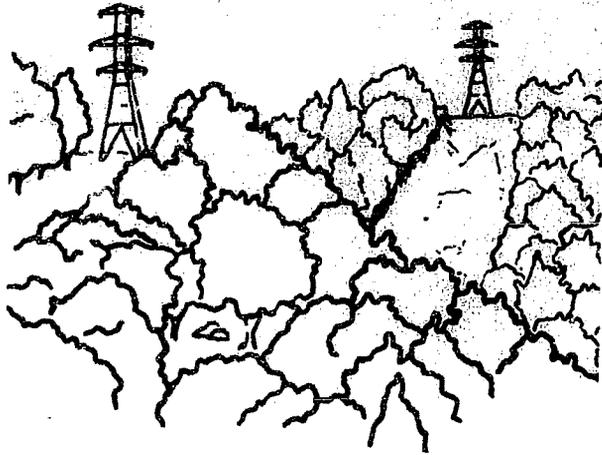


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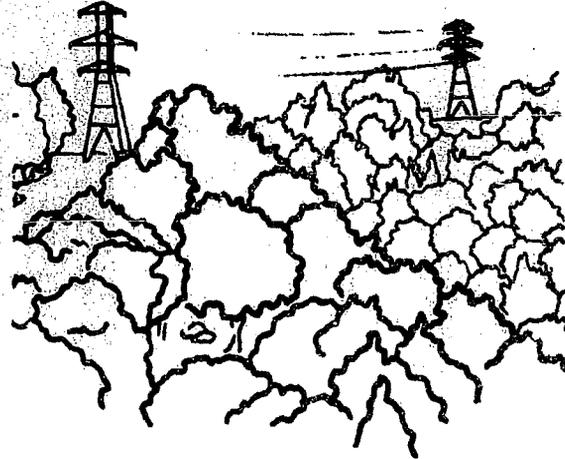
- Transmission lines should cross canyons up-slope from roads which traverse the canyon basins if the terrain permits.



- When crossing valleys in a forest, high, long-span towers should be used to keep the power lines above the trees and to eliminate the need to clear all vegetation from below the lines. Only as much vegetation as is necessary to string the line should be cut.

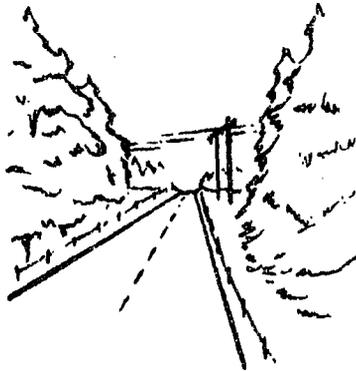


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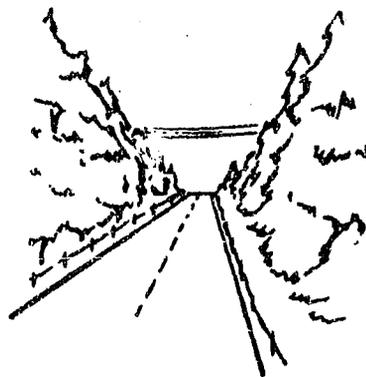


PREFERRED

- Where ridges or timber areas are adjacent to highways or other areas of public view, overhead lines should be placed beyond the ridges or timber areas.
- In forest or timber areas, high, long-span towers should be used to cross highways in order to retain much of the natural growth along the highways.

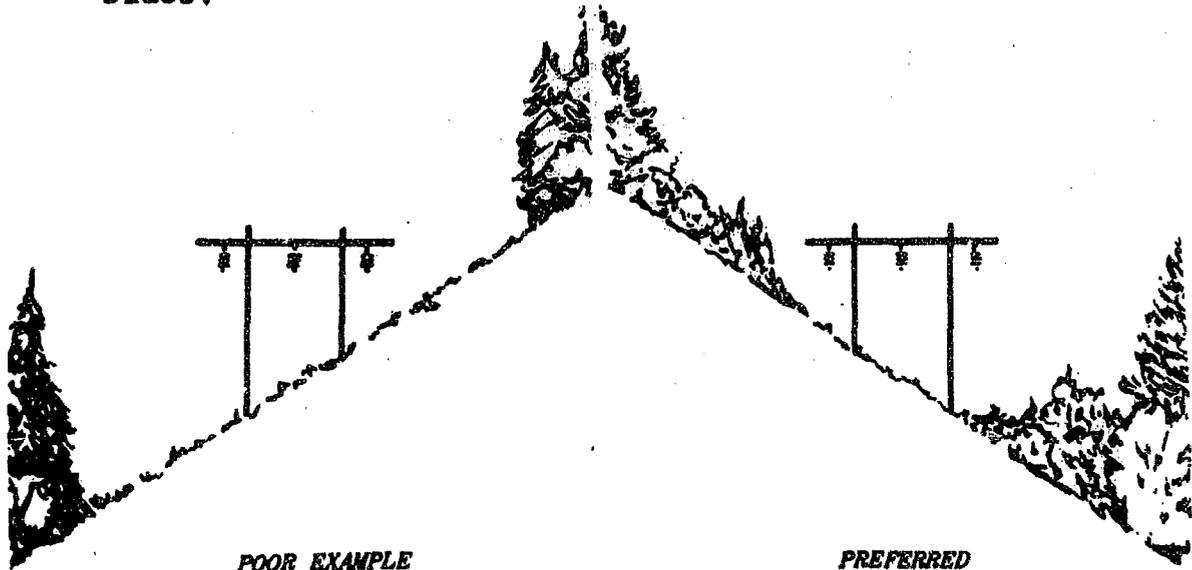


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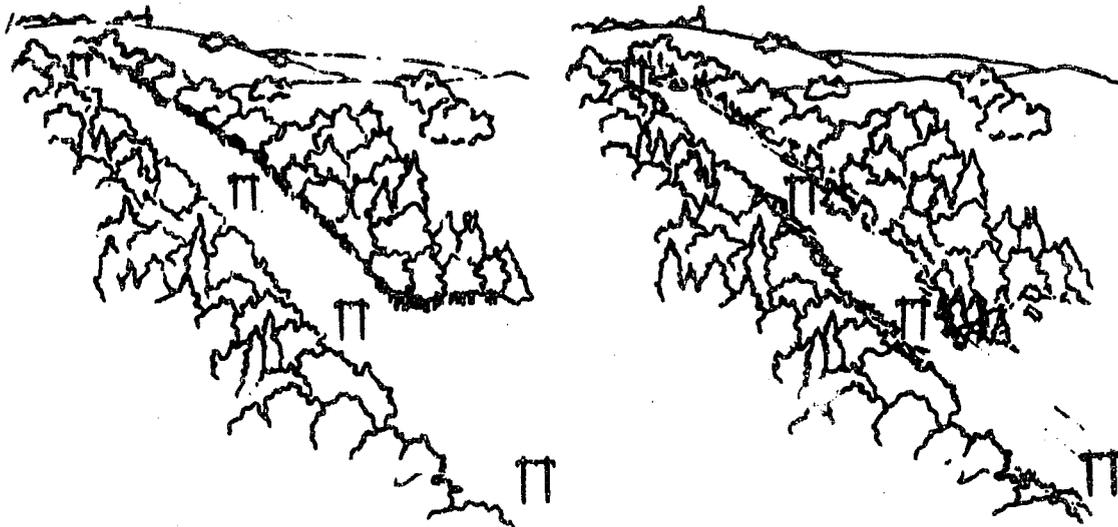


PREFERRED

●Rights-of-way should cross hills and mountains obliquely rather than straight up and down the sides.



●Where rights-of-way enter dense timber from a meadow or other clearing, trees should be feathered in at the entrance of the timber for a distance of 150-200 yards.



POOR EXAMPLE

PREFERRED

- Native shrubs and trees should be left in place or planted randomly, with the necessary allowance for safety, near the edges of rights-of-way adjacent to roads.



POOR EXAMPLE

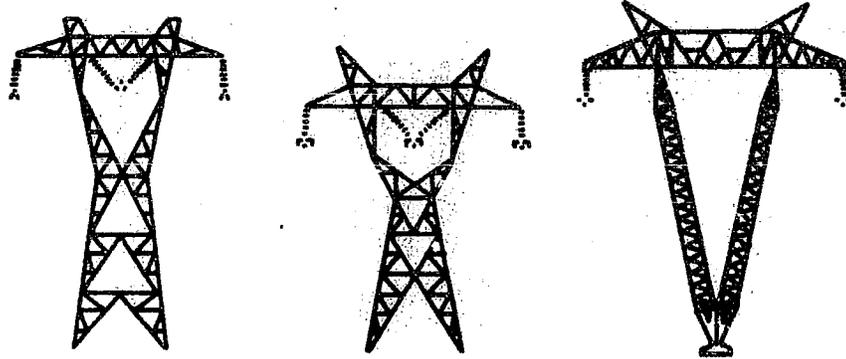


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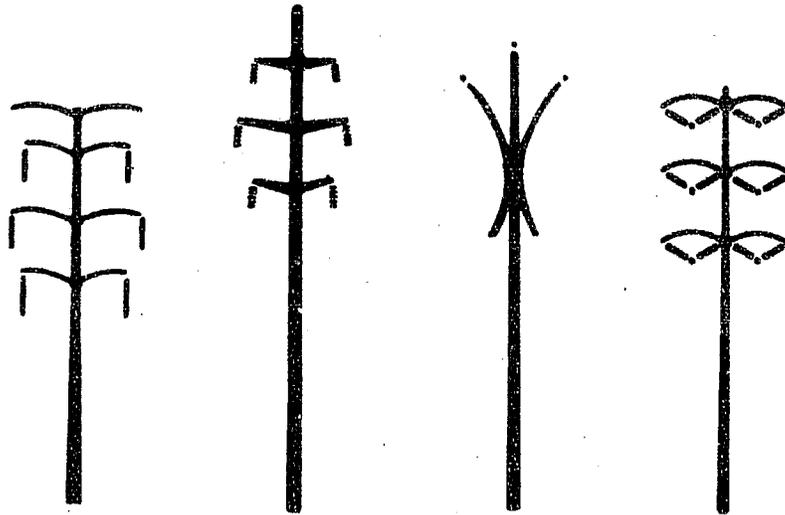
- Transmission lines should not be located or cross at road intersections or interchanges where possible.
- The Federal Highway Administration and the State Highway Department should be consulted with respect to any applicable guidelines or regulations they might have to govern transmission lines which cross highways.

The Design of Transmission Towers

- The size of transmission towers should be kept to the minimum feasible.

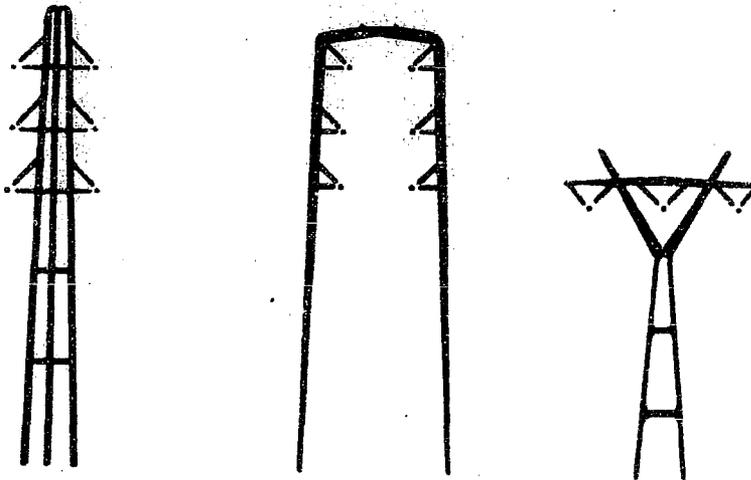


STANDARD TOWER DESIGNS



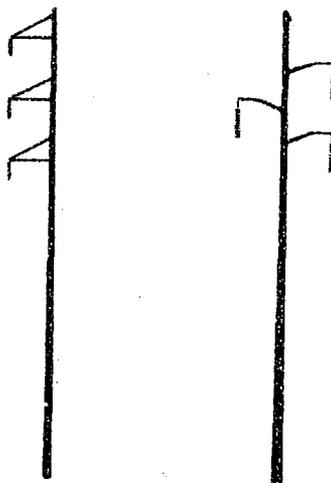
NEWER TOWER DESIGNS

- Simple, but functional, designs of towers and poles should be used. Illustrations of these kinds of structures can be found in the book Electric Transmission Structures, sponsored by the Electric Research Council.

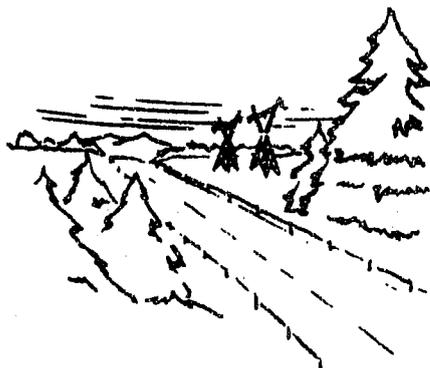


HENRY DREYFUSS & ASSOCIATES DESIGNS

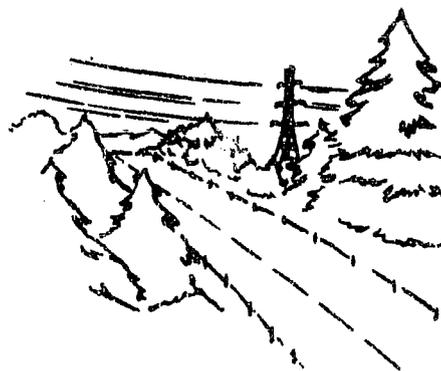
- The use of poles designed without cross-arms for electric transmission lines of 138 kv and below and communications cables should be considered.



- The use of different tower designs at intervals along rights-of-way should be considered.
- Transmission towers should be spaced apart at the maximum feasible distance which would not cause unsightly tower height, conductor sag, or excessive removal of trees.
- The materials used to construct transmission towers and the colors of the components of the towers should comport with the natural surroundings.
- In addition to steel and aluminum transmission towers, the use of towers constructed of fiberglass, reinforced plastic, laminated wood, concrete, and other materials should be considered.
- The use of treated single or double wood poles should be considered in forest or timber areas.
- The use of weathered galvanized steel structures should be considered when transmission towers are to be silhouetted against the sky.
- The form of the insulator should be integrated with the form of the transmission tower. Where both a strain insulator and a post insulator are used on a single tower, the designs of each should be coordinated with the form of the tower.
- Where two or more circuits are required at highway crossings, the use of multiple circuit towers should be considered.



POOR EXAMPLE



PREFERRED

The Maintenance of Transmission Line Rights-of-Way

- Once a cover of vegetation has been established on a right-of-way, it should be properly maintained.
- A grass cover should be maintained in the areas immediately adjacent to transmission towers. Low growing trees, shrubs, herbs and grass should be planted on rights-of-way at adequate distances from transmission facilities.
- Access roads and service roads should be maintained with grass cover, water bars and the proper slope in order to prevent soil erosion.
- In scenic areas, vegetation should be treated with chemicals in late autumn or early spring in order to minimize the impact of the temporary discoloration of the foliage. Chemical growth retardants which would cause permanent discoloration of the foliage should not be used. Care should be taken to assure that chemicals used to control the growth of tree stumps do not damage other vegetation.
- When rights-of-way are inspected to check the operation of appurtenant facilities, attention should be given to locate gullies and fallen timber and to observe the condition of the vegetation. The use of aircraft to inspect and maintain rights-of-way should be encouraged.

Possible Secondary Uses of Rights-of-Way

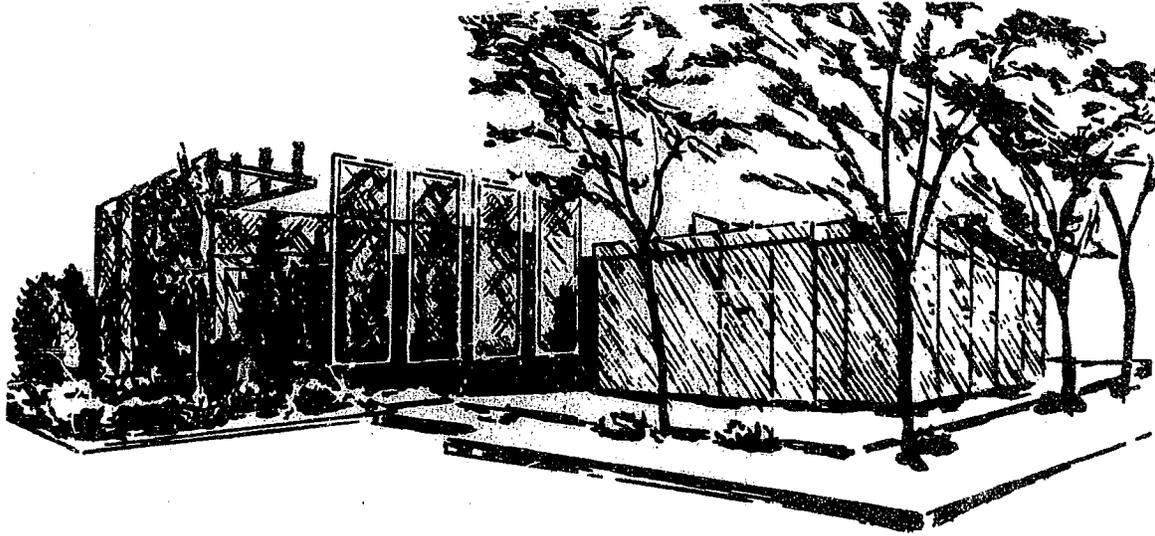
One of the potential benefits of transmission line routes is that clearings at safe distances adjacent to transmission facilities may be used for secondary purposes. The following should be considered as possible secondary uses of rights-of-way:

- Cultivation of Christmas trees, elderberry or huckleberry bushes, and other nursery stock.
- Parks.
- Golf courses.
- Equestrian or bicycle paths.
- Orchards.
- Picnic areas.
- Bird sanctuaries.
- Game refuges.
- Hiking trail routes.
- General agriculture.
- Winter sports.

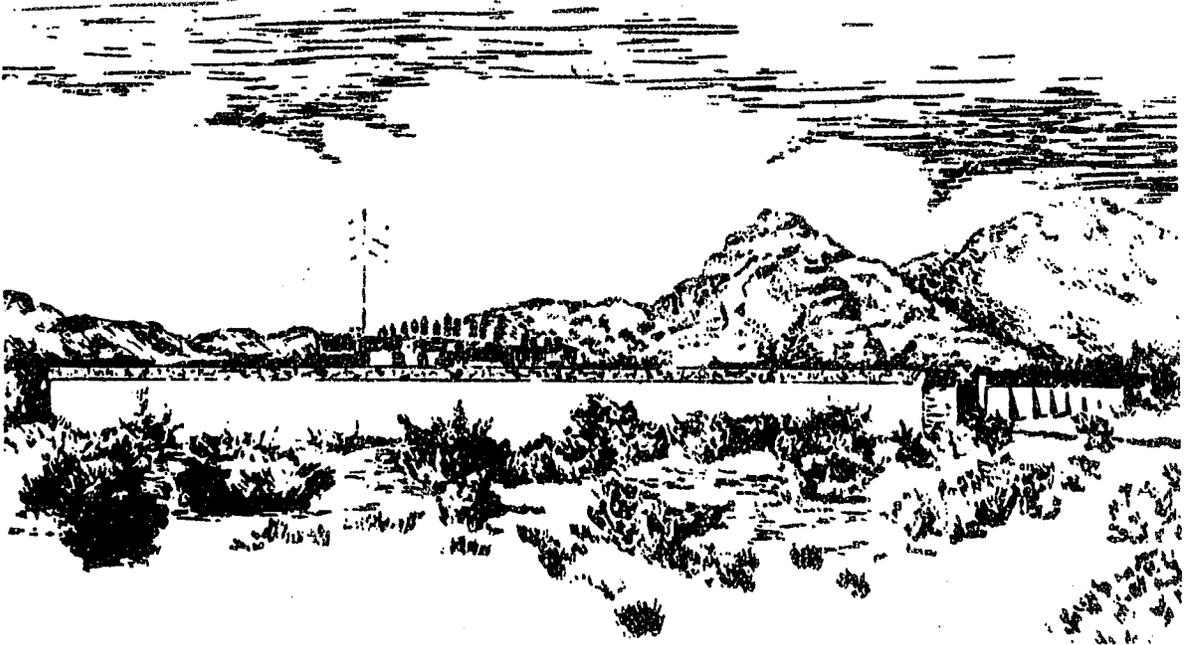
The Location of Appurtenant Aboveground Facilities

- **The proposed designs and locations of electric substations, pipeline compressor stations, pumping stations, cooling stations, and other aboveground facilities, including meter and regulator stations and communication towers, should be made available to local agencies which have jurisdiction over these matters sufficiently in advance of construction deadlines to permit adequate review.**
- **Unobtrusive sites should be selected where possible for the location of substations and like facilities.**
- **Potential noise should be considered when the locations for gas turbines, substations and like facilities are being determined. Such facilities should be located in areas where sound will not be resonated.**
- **The size of substations and like facilities should be kept to the minimum feasible.**
- **The designs of the exteriors of substations and like facilities should comport with the surroundings and other buildings in the area. For example, if a substation is to be located in a residential area, its design should comport with the designs of nearby residences.**
- **If substations are located in residential or other scenic areas, the appurtenant transmission conductors and distribution conductors adjacent to the substations should be placed underground.**

- Trees and shrubs should be planted in the area adjacent to substations and like facilities in order to conceal them in part from public view.



- Storage tanks in scenic areas should be placed below-ground where feasible. If storage tanks must be placed aboveground, they should be concealed in part by appropriate plantings of trees and shrubs.
- The materials used to construct substations, storage tanks and like facilities and the colors of these materials should comport with the surroundings.



FEDERAL POWER COMMISSION

TERMS AND CONDITIONS OF LICENSE
FOR UNCONSTRUCTED MAJOR PROJECT AFFECTING
THE INTERESTS OF INTERSTATE OR FOREIGN COMMERCE

Article 1. The entire project, as described in the order of the Commission, shall be subject to all the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however: That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval amended, supplemental, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. Said project works shall be constructed in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life,

health, or property, no substantial alteration or addition not in conformity with the approved plans shall be made to any dam or other project works under the license without the prior approval of the Commission; and any emergency alteration or addition so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in the project works or divergence from such approved exhibits may be made if such changes will not result in decrease in efficiency, in material increase in cost, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct. Upon the completion of the project, or at such other time as the Commission may direct, the Licensee shall submit to the Commission for approval revised maps, plans, specifications, and statements insofar as necessary to show any divergence from or variations in the project area and project boundary as finally located or in the project works as actually constructed when compared with the area and boundary shown and the works described in the license or in the maps, plans, specifications, and statements approved by the Commission, together with a statement in writing setting forth the reasons which in the opinion of the Licensee necessitated or justified variations in or divergence from the approved maps, plans, specifications, and statements. Such revised maps, plans, specifications, and statements shall, if and when approved by the Commission, be made a part of the license under the provisions of Article 2 hereof.

Article 4. The construction, operation, and maintenance of the project and any work incident to additions or alterations shall be subject to the inspection and supervision of the Regional Engineer, Federal Power Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of the project. Construction of the project works or any feature thereof shall not be initiated until the program of inspection for the project works or any such feature thereof has been approved by said representative. The Licensee shall also furnish to said representative such further information as he may require concerning the construction, operation, and maintenance of the project, and of any alteration thereof, and shall notify him of the date upon which work will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall allow him and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may from time to time prescribe for the protection of life, health, or property.

Article 5. The Licensee within two years from date of issuance of the license shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction, maintenance and operation of the project. The Licensee, its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights of occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deed or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license, as provided in Section 14 of the Act, or is transferred to a new licensee under the provisions of Section 15 of the Act, the Licensee, its successors and assigns will be responsible for and will make good any defect of title to or of right of occupancy and use in any of such project property which is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and will pay and discharge, or will assume responsibility for payment and discharge, of all liens or incumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new Licensee, to acquire any different title to or right of occupancy and use in any of such project property than was necessary to acquire for its own purposes as Licensee.

Article 7. The actual legitimate original cost of the original project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Act and the Commission's rules and regulations thereunder.

Article 8. After the first 20 years of operation of the project under the license, six percent per annum shall be the specified rate of return on the net investment in the project for determining surplus earnings of the project for the establishment and maintenance of amortization reserves, pursuant to Section 10 (d) of the Act; one-half of the

project surplus earnings, if any, accumulated after the first 20 years of operation under the license, in excess of six percent per annum on the net investment, shall be set aside in a project amortization reserve account as of the end of each fiscal year; Provided, that, if and to the extent that there is a deficiency of project earnings below six percent per annum for any fiscal year or years after the first 20 years of operation under the license, the amount of such deficiency shall be deducted from the amount of any surplus earnings accumulated thereafter until absorbed, and one-half of the remaining surplus earnings, if any thus cumulatively computed, shall be set aside in the project amortization reserve account; and the amounts thus established in the project amortization reserve account shall be maintained therein until further order of the Commission.

Article 9. For the purpose of determining the stage and flow of the stream or streams from which water is diverted for the operation of the project works, the amount of water held in and withdrawn from storage, and the effective head on the turbines, the Licensee shall install and thereafter maintain such gages and stream-gaging stations as the Commission may deem necessary and best adapted to the requirements; and shall provide for the required readings of such gages and for the adequate rating of such stations. The Licensee shall also install and maintain standard meters adequate for the determination of the amount of electric energy generated by said project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission and may be

altered from time to time if necessary to secure adequate determinations, but such alteration shall not be made except with the approval of the Commission or upon the specific direction of the Commission. The installation of gages, the ratings of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of said project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision or cooperation for such periods as may be mutually agreed upon. The Licensee shall keep accurate and sufficient record of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 10. The Licensee shall install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so, after notice and opportunity for hearing.

Article 11. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 12. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or of the United States of a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereon as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the costs of making the determinations pursuant to the then current Commission Regulations under the Federal Power Act within 60 days from the date of rendition of a bill therefore and, upon failure to do so, shall thereafter be subject to the payment of the penalties specified in the then current Regulations. The Licensee shall have the right to pay such amounts under protest within the 60-day period and to reconsideration of the determination of the amounts billed or a hearing as provided by the then current Regulations under the Act.

Article 13. The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such

reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes; and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

Article 14. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall, after notice and opportunity for hearing, permit such reasonable use of its reservoirs or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission in the interest of comprehensive development of the waterway or waterways involved and the conservation and utilization of water resources of the region, for water supply for the purpose of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation, at least full reimbursement for any damages or expenses which the joint use causes him to incur, for use of its reservoirs or other project properties or parts thereof for such purposes, any such compensation to be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain

information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot be concurrently submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 15. In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by other lawful authority for avoiding or eliminating inductive interference.

Article 16. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance and operation of such facilities and comply with such reasonable modifications of the project structures and operation as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing and upon findings based on substantial evidence that such facilities and modifications are necessary and desirable, reasonably consistent with the primary purpose of the project, and consistent with the provisions of the Act.

Article 17. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of Licensee's lands and interest in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be prescribed by the Commission, reasonably consistent with the primary purpose of the project, in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 18. The Licensee shall construct, maintain and operate or shall arrange for the construction, maintenance and operation of such recreational facilities including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities and utilities, and shall comply with such reasonable modifications of the project structures and operations as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal and State agencies, after notice and opportunity for hearing and upon findings based upon substantial evidence that such facilities and modifications are necessary and desirable, and reasonably consistent with the primary purpose of the project.

Article 19. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and recreational purposes, including fishing and hunting, and shall allow to a reasonable extent for such purposes the construction of access roads, wharves, landings, and other facilities on its lands the occupancy of which may in appropriate circumstances be subject to payment of rent to the Licensee in a reasonable amount: Provided, that the Licensee may reserve from public access, such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property and Provided, further, that the Licensee's consent to the construction of access roads, wharves, landings, and other facilities shall not, without its express agreement, place upon the Licensee any obligation to construct or maintain such facilities. These facilities are in addition to the facilities that the Licensee may construct and maintain as required by the license.

Article 20. The Licensee shall be responsible for and shall take reasonable measures to prevent soil erosion on lands adjacent to the stream and to prevent stream siltation or pollution resulting from construction, operation or maintenance of the project. The Commission upon request, or upon its own motion, may order the Licensee to construct and maintain such preventive works to accomplish these purposes and to revegetate exposed soil surface as the Commission may find to be necessary after notice and opportunity for hearing.

Article 21. There is reserved to the appropriate department or agency of the United States, or of the State or county involved, the right to take over, maintain, and supervise the use of any project road as a public road.

Article 22. The Licensee shall clear and keep clear to an adequate width lands along open conduits, shall clear lands within the bottom and margin of reservoirs (except as may be otherwise specified in the license), and shall dispose of all temporary structures, unused timber, brush, refuse, or inflammable material resulting from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the margins of reservoirs which may die during operations of the project shall be removed. The clearing of the lands and the disposal of the material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission.

Article 23. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project for a period of three years, or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license, and not less than 90 days after public notice may in its discretion terminate the license.

Article 24. Upon abandonment of the project the Licensee shall remove all structures, equipment and power lines from the stream and restore said stream to a condition satisfactory to the Commission's authorized representative and shall fulfill such other obligations under the license as the Commission may prescribe.

Article 25. The right of the Licensee and of its transferees and successors to use or occupy waters, over which the United States has jurisdiction, under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless Licensee has obtained a new license pursuant to the then existing laws and regulations or an annual license under the terms and conditions of this license.

Article 26. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.