

biomedical technology, and computational biology. One of the components of these programs deals with correctly assessing the dose to various systems that are exposed to radiation fields during treatment. These systems could range from biomolecules to different tissues and organs. The exposure to both patients and health care providers results from such sources as neutrons, high LET radiation, and low LET radiation such as electrons, x-rays, and gamma rays. In many situations, radiation could be combinations of the various radiation fields listed above. For example, development of improved methods for determination of dose to normal vs. cancerous tissue, and of strategies for maximizing the dose to cancerous tissue will be of special interest. This includes, but is not limited to, planning tools for conformal therapy, BNCT, internal emitter therapy and charged particle therapy, biological response to normal and pathological tissue as expressed in the tumor control probability, and normal tissue complication probability. Research topics include: (a) applying the fundamental knowledge about interaction of radiation with matter in developing methodologies for determining dose to the target cells in individual organs and tissues, (b) research associated with developing concepts for use and improving the radiation protection standards and practices at DOE facilities, and specifically, that research which will contribute to correctly assessing the dose to internal organs by internal emitters.

DATES: Formal applications submitted in response to this notice must be received by 4:30 p.m., E.S.T., February 15, 1996, to be accepted for a May merit review and to permit timely consideration of award in Fiscal Year 1996.

ADDRESSES: Formal applications referencing Program Notice 95-17 should be forwarded to: U.S. Department of Energy, Office of Energy Research, Grants and Contracts Division, ER-64, 19901 Germantown Road, Germantown, Maryland 20874, Attn: Program Notice 95-17. The following address must be used when submitting applications by U.S. Postal Service Express Mail, any commercial mail delivery service, or handcarried by the applicant: U.S. Department of Energy, Office of Energy Research, Grants and Contracts Division, ER-64, 19901 Germantown Road, Germantown, Maryland 20874.

FOR FURTHER INFORMATION CONTACT: Dr. Matesh N. Varma, Office of Health and Environmental Research, ER-73, U.S.

Department of Energy, 19901 Germantown Road, Germantown, Maryland 20874, telephone: (301) 903-3209.

SUPPLEMENTARY INFORMATION: The Department of Energy announces its interest in receiving applications in support of research in the field of dosimetry for use in improving radiation treatment planning and reducing the radiation exposure to patients and workers.

Before preparing a formal application, potential applicants are encouraged to submit a brief preapplication in accordance with 10 CFR 600.10(d)(2), which consists of two to three pages of narrative describing research objectives and methods of accomplishment. These will be reviewed relative to the scope and research needs for the radiation dosimetry and medical applications program. Preapplications referencing Program Notice 95-17 should be received by October 1, 1995, and sent to Dr. Matesh N. Varma, Office of Health and Environmental Research, ER-73, Department of Energy, 19901 Germantown Road, Germantown, Maryland 20874, (301) 903-3209. Telephone and fax numbers are required to be part of the preapplication. A response to the preapplication discussing potential relevance of a formal application will be communicated by November 15, 1995. It is anticipated that approximately \$1 million will be available for grant awards during Fiscal Year 1996 contingent upon availability of funds. We expect to award several grants in this area of research ranging from a few thousand to a few hundred thousand dollars per year. Information about development, submission, and selection process, and other policies and procedures may be found in the Application Guide for the Office of Energy Research Financial Assistance Program 10 CFR Part 605. The Application Guide is available from the U.S. Department of Energy, Office of Health and Environmental Research, ER-73, 19901 Germantown Road, Germantown, Maryland 20874. Telephone requests may be made by calling (301) 903-5349.

The Catalog of Federal Domestic Assistance Number for this program is 81.049, and the solicitation control number is ERFAP 10 CFR Part 605.

D.D. Mayhew,

Associate Director, Office of Resource Management, Office of Energy Research.

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Western Area Power Administration

Flatiron-Erie 115-kilovolt Transmission Line Project Record of Decision

AGENCY: Western Area Power Administration, DOE.

ACTION: Record of decision.

SUMMARY: The Department of Energy (DOE), Western Area Power Administration (Western) has prepared this Record of Decision (ROD) pursuant to regulations of the Council on Environmental Quality (40 CFR Part 1505) and Implementing Procedures of the Department of Energy (10 CFR Part 1021). This ROD is based upon the information contained in the "Final Environmental Impact Statement, Flatiron-Erie 115-kV Transmission Line, Larimer, Boulder & Weld Counties, Colorado" (DOE/EIS-0159). Western has considered all public and regulatory comments received on the final EIS in preparation of this ROD.

SUPPLEMENTARY INFORMATION: Western has made the decision to upgrade the existing Flatiron-Erie 115-kilovolt (kV) transmission line. The line is located in Larimer, Weld and Boulder Counties, Colorado, and passes through the City of Longmont. The line connects the existing Flatiron Substation and several other existing substations supplying Longmont. It is a single circuit 115-kV line, 31.5 miles long, and was built in 1950-51, on a 750-foot wide right-of-way (ROW) using wood-pole-H-frame structures.

Western proposes to build 27 new wood H-frame structures along the line, to replace or modify 45 of the existing structures and to remove 11 of them. Many of these additions and changes would involve structures that are approximately 5 to 15 feet taller than the existing ones. The existing conductors and ground wires would remain in place. The purpose of these actions would be to allow the power carrying capability of the line to be increased and to replace deteriorating structural members. The line would continue to operate at 115-kV.

Background

The proposed action evolved from an earlier project, the Flatiron-Gunbarrel Transmission Line Project, that would have replaced most of the existing 115-kV Flatiron-Erie line with a double circuit 115/230-kV line. Partly because of public opposition to the project, Western conducted additional electrical systems planning studies and determined that it could be postponed, if various substation improvements and

changes in procedure were made, and the Flatiron-Erie line uprated.

The Flatiron-Erie line is currently operating at a rating or load capacity that is lower than the load its conductors are capable of carrying. Originally designed for a conductor rating of 109 megavolts-amperes (MVA), systems studies and field measurements conducted by Western determined that the actual Flatiron-Erie transmission line ratings were significantly smaller. As conductors carry more power they become hotter, as they become hotter, they expand and sag closer to the ground. The National Electric Safety Code (NESC), in order to avoid risk of electrical shocks, stipulates a minimum clearance between power lines and the ground. For 115-kV transmission lines, this limit is 22 feet. Western found that in some locations the Flatiron-Erie transmission line failed to meet current NESC requirements. The line was derated to prevent potential problems associated with ground clearances that do not meet current NESC guidelines. The lowered rating will cause it to overload when certain other local transmission facilities are out of service. The result of this could be loss of power to the City of Longmont. During the planning for this proposal, several public meetings were held, both in connection with the earlier Flatiron-Gunbarrel project and with the Flatiron-Erie project. Public meetings were held in Longmont, Colorado, in November 1989, at the beginning of the preparation of the draft EIS. Another meeting was held in December 1990 to review with the public the status of the environmental studies and the potential project alternatives. A public hearing on the Draft EIS was held in Longmont, Colorado on November 18, 1993.

Western also communicated throughout the EIS process with federal, state and local agencies interested in the project. Public comments throughout the EIS process focused on the preference of the public for underground burial of the transmission line, the effects of electromagnetic fields (EMF) on public health and safety, preferences for new routing away from residential areas, and the possibility that the transmission line could be operated at 230-kV some time in the future.

Description of Alternatives: Western's preferred alternative proposes to uprate the 31.5 mile Flatiron-Erie 115-kV transmission line by adding, replacing, modifying, and removing structures. Eighty-three of the 216 existing structures would be modified. Some of the heights of the structures would be raised 5-15 feet. With changes in structure height the conductors might

have to be resagged or reworked. The voltage of the transmission line would remain at 115-kV, the existing conductors would remain in place, and the majority of the existing structure locations would remain the same.

Structural tests of the line conducted in 1990 revealed the need for replacement of approximately 25 wood poles which were structurally unsound because of internal rot. Replacement of these poles will be done along with the other structure modifications to uprate the line. In addition, improved grounding features would be installed on the structures.

In summary, Western's proposed action is to:

- Build 27 new wood H-frame structures at new sites along the existing ROW.
- Replace or modify 45 existing structures, including:
 - Replace 20 existing structures at existing sites. The structure heights would be increased by 5 feet in 6 cases, 10 feet in 9 cases, and 15 feet in 5 cases.
 - Replace 22 existing structures with structures of the same height, in the same locations.
 - Modify 3 existing structures by raising their respective cross arms.
 - Remove complete structures at 11 sites. (These structures would be replaced by adjacent structures along the ROW, accounting for some of the 27 new structures listed above).

Numerous actions were considered as alternatives to the proposed action. These included the No-Action Alternative, energy conservation, alternative transmission technologies, alternative electrical transmission systems, alternative structure types and alternative methods of construction. From this wide range of alternatives, four primary alternatives were developed and given detailed and equal analysis in the EIS.

Under the No-Action Alternative, Western would not uprate the existing 115-kV line, but would only perform essential maintenance activities as needed. Structures and hardware would be repaired and/or replaced as required during regular maintenance operations and in response to emergency outages on the line. These repairs would have to be made with increasing frequency in the future as the line increases in age. This alternative does not increase the rating of the Flatiron-Erie line, nor does it resolve the electrical safety and human health issues.

Western's proposed action, the uprating of the existing Flatiron-Erie transmission line. This is Alternative B, the environmentally preferred

alternative, that would best and most economically satisfy the project need.

Alternative C would rebuild the existing Flatiron-Erie transmission line underground for 6.1 miles through Longmont and uprate the remainder of the existing transmission line. (Alternatives B and C would make no change to the existing electrical systems).

Alternative D would remove two segments of the existing Flatiron-Erie transmission line in Longmont, supply Longmont's substations using other existing transmission lines and a segment of new overhead transmission line, uprate the remainder of the existing transmission line, and build a new substation south of Longmont. It would make substantial changes to the existing electrical system.

Basis for Decision

The environmental impact statement (EIS) first defined the potential theoretical impact levels for all possible project construction actions affecting all sensitive environmental components in the study area. Then it quantified the actual impacts for the proposed system of primary alternative routes. There were no significant adverse impacts identified from any of the primary alternatives. The alternatives were therefore compared using "moderate adverse impacts" and "beneficial effects".

There would be no impacts to earth resources from Alternatives B and D, and very small amounts of short-term moderate impacts from Alternative C. Alternatives B and D would have no substantial adverse impact on water resources. Alternative C would cause a small amount of short-term moderate impacts on water resources and, in addition, moderate long-term impacts on streams. Alternative B would cause moderate amounts of short-term moderate impacts to land uses. Alternative C would cause substantial amounts of short-term moderate impacts to land uses, but would also have substantial amounts of long-term beneficial effects from the removal of segments of the existing line and their replacement by underground construction. Alternative D would also cause substantial amounts of impacts on land uses, but it would also have long-term beneficial effects from the removal of segments of the line. Alternative B would have the least impacts on existing land use, and Alternative D the most.

Alternative B would cause relatively small amounts of short-term moderate impacts to biological resources (wetlands) from construction

disturbance. Alternative C would cause slightly more short-term moderate impacts, and Alternative D, very slightly more than Alternative C.

However, Alternative C would also have short-term moderate impacts on two streams that are Colorado rare fish habitat and long-term moderate adverse impacts on the rare fish habitat. Alternative B would have the least impact on fish habitat, and Alternative C the most impact. Cultural resources would not be subject to other than low level impacts from any of the primary alternatives.

There would be no substantial adverse effects on visual resources from Alternative B. Alternative C would have small amounts of short and long-term moderate visual impacts, but substantial amounts of beneficial visual effects from the removal of segments of the existing line and their replacement by underground construction. Alternative D would cause moderate amounts of short and long-term moderate visual impacts and substantial amounts of long-term visual benefits. Alternative B would have the least and D the most impacts on visual resources. In summary, overall comparison of moderate adverse environmental impacts, both long and short term, for each of the three primary alternatives, shows that Alternative B ranks the best for all environmental resource areas and, therefore, is the environmentally preferred alternative.

Also considered in this decision was the estimated costs of each alternative, which are as follows:

- Alternative B \$1,438,000.
- Alternative C \$11,168,000.
- Alternative D \$6,067,000.

As related to the transmission of power, Western's Conservation and Renewable Energy Program (C&RE) encourages the development and implementation of energy efficiency measures. Western's C&RE Program has been applied effectively for more than a decade. However, the C&RE Program has not decreased or delayed the need for transmission line improvements.

Several alternative transmission technologies were evaluated, including:

- Conventional overhead alternating current (AC) transmission;
- Overhead direct current (DC) transmission; and
- Under-ground construction.

Western proposes to use conventional overhead AC transmission on the proposed action and for major portions of the proposed project alternatives.

Overhead DC lines must include converter stations at either end of the line and at every point where it is interrupted to convert DC current to AC

for consumer use. Only with line segment lengths far greater than those proposed here, and transmission of much larger amounts of power, would the economic advantages of DC transmission offset the high cost of the converter stations.

The underground alternative (Alternative C) was considered by Western in response to public comments. It consists of reconstruction of the Flatiron-Erie line underground through Longmont. Underground construction of a 115-kV transmission line can cost five to ten times more per mile than a 115-kV transmission line installed overhead. Another disadvantage is the need for a continuous zone of disturbance along the ROW; the underground cable system must be installed in a continuous trench approximately 2 feet wide and 3 to 5 feet deep. At any given point where a transition is made from underground construction to overhead construction, a large overhead transmission line structure must be installed. If a high pressure oil-filled cable system is used, pumping and pressuring facilities would be required at intervals of several miles along the underground line.

Several systems alternatives were studied. A systems alternative (Alternative D) was formulated in response to public comment to explore the feasibility of removing portions of the line from densely developed areas of Longmont.

Six additional systems alternatives were considered and eventually rejected from further study because they did not meet electrical criteria, would be very expensive, and would be associated with greater environmental impacts.

Considerations in the Implementation of the Decision: Western has decided to uprate the transmission line in compliance with the NESC standards. There are considerations to be followed that will minimize the potential environmental impacts of the decision. The following details the measures taken and to be taken to minimize impacts.

Alternative B, the proposed action, will involve pole replacements near wetland habitat supporting a threatened species of orchid. The U.S. Fish and Wildlife Service (FWS) listed the ladies' tresses orchid (*Spiranthes diluvialis*) in 1992. The EIS required mitigation for potential effects to this species. A survey was required, prior to construction disturbance, in habitats along the transmission line route that have a wetlands hydrology and a prevalence of wetlands vegetation. The Flatiron-Erie transmission line spans several wetlands, including potential

orchid habitat along Chimney Hollow, McIntosh Lake, St. Vrain Creek, Left Hand Canyon, Dry Creek, a wetlands complex near and along Boulder Creek, and Coal Creek. Field surveys for ladies' tresses orchid were concluded in all wetland areas spanned by the transmission line during the 1994 flowering season and no ladies' tresses orchids were found.

Numerous prairie dog towns occur throughout the project area, providing potential habitat for the endangered black-foot ferret. Two small towns are located along the existing transmission line. In consultation with FWS, Western has determined that these towns are too small and isolated to provide habitat for black-footed ferret or to require survey for ferrets.

Based on the consultations with the FWS concerning threatened and endangered species, they concurred with Western's determination that the project would not adversely effect such species in a letter dated March 21, 1995.

Golden eagles are known to nest in the project study area. Five historical nesting territories are documented in the EIS. The EIS required survey of these nest sites to assess the potential impact of the project on golden eagles that may have returned to these nesting territories. A survey was conducted by Western and the Colorado Division of Wildlife in early April 1995. The nesting sites were located; however, no evidence of recent nesting activity was observed.

No extraordinary mitigative measures will be required to reduce the moderately adverse impacts to the other resources, such as land uses, cultural resources, and visual resources. These impacts can be mitigated by following Western's standard construction mitigation measures that Western has already agreed to follow.

At this time, it is not clear if exposure to EMF presents a health risk. The consensus opinion of the majority of researchers continues to center on the need for further research. Should science establish a significant risk to public health as a result of EMF exposure, it is Western's expectation that the issues of EMF standards, avoidance strategies, evaluation procedures, etc., would be addressed in Federal and State regulations after a careful, structured public debate that weighs risk against cost. Uprating the existing Flatiron-Erie transmission line will serve Longmont's electrical capacity needs into the 21st century, thus allowing time for further research into the relationship between EMF and human health.