DAIRYLAND POWER COOPERATIVE · P.O. BOX 817 · 2615 EAST AV. SOUTH · LA CROSSE, WISCONSIN 54601
(608) 788-4000

June 16, 1981

In reply, please refer to LAC-7594

DOCKET NO. 50-409

U. S. Nuclear Regulatory Commission
ATTN: Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
Division of Operating Reactors
Washington, D. C. 20555

SUBJECT: DAIRYLAND POWER COOPERATIVE
LA CROSSE BOILING WATER REACTOR (LACBWR)
PROVISIONAL OPERATING LICENSE NO. DPR-45
SEP TOPIC II.1.B, POPULATION DISTRIBUTION;
SEP TOPIC II.3.A, HYDROLOGIC DESCRIPTION

Reference: (1) DPC Letter, LAC-7387, Linder to Eisenhut, dated February 27, 1981.

Gentlemen:

Enclosed find Safety Evaluation Reports (SER's) for Population Distribution (SEP-II.1.B) and Hydrologic Description (SEP-II.3.A) which we have prepared for the La Crosse Boiling Water Reactor.

Our letter, Reference 1, identified topics for DPC to submit for NRC evaluation. The subject topics were listed in the schedule submitted with Reference 1.

If there are any questions regarding this letter, please contact us.

Very truly yours,

DAIRYLAND POWER COOPERATIVE

Frank Linder

Frank Linder, General Manager

JDP:FL:af

cc: J. G. Keppler, Reg. Dir., NRC-DRO III
NRC Resident Inspectors

8106190176 P

LA CROSSE BOILING WATER REACTOR

SYSTEMATIC EVALUATION PROGRAM
SAFETY EVALUATION REPORT
TOPIC II.1.B
POPULATION DISTRIBUTION

The safety objective of this topic is to assure that the exclusion area, low population zone, and population center distance are in conformance with the requirements of 10CFR100 as reissued August 1, 1980. The review was conducted in accordance with the guidance given in NUREG-75/087, "Standard Review Plan", Section 2.1.3, "Population Distribution", Revision 1. The adequacy of emergency preparedness planning for the area surrounding the plant including the low population zone will be assessed by the Commission in a separate review effort.[1]

The region surrounding the La Crosse Boiling Water Reactor is of low population and rural in character. The population density within a 5-mile radius of the plant is 13.6 persons per square mile[1] based upon population dispersions used in the La Crosse Boiling Water Reactor Safeguards Report (ACNP-65544)[2] as updated using the prliminary 1980 census figures for Vernon County, Wisconsin. The region has exhibited a stable population for the period 1960-1980 with rural townships along the river showing a modest growth and the incorporated Village of Genoa showing a decline.

No significant transient population is present.[1] Individuals transient in the area are generally sports fisherman, U. S. Army Lock and Dam workers, and passengers in cars passing on state trunk highways. Actual estimates were based on figures from the Wisconsin State Department of Transportation and were based on methodology outlined in NUREG-0654/FEMA-REP 1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants", Appendix 4. The average seasonal transient population should not exceed 20% of the permanent population. Much of the growth in number of individuals present is offset by residents absenting themselves daily during the work week for jobs in the La Crosse area 20 miles north.

The nearest incorporated city to the plant is La Crosse, Wisconsin, approximately 20 miles to the north with a 1980 initial census population of 48,000 to 49,000. The growth of the La Crosse area has principally been in urbanized areas to the north of the city and the incorporated area population is expected to remain stable.

The exclusion area of LACBWR lies within a 1109-foot radius circle centered on the Reactor Building. This area is determined in accordance with the requirements of 10CFR100.11.a.1 as it defines the boundary at which radiation exposure to an individual in the two hours following the onset of the postulated fission product release would not exceed 25 Rem whole body or a total radiation dose of 300 Rems to the thyroid from iodine exposure.[2]

The low population zone was earlier defined in 10CFR Part 100 as "that area immediately surrounding the exclusion area which contains residents, the total number and density of which are such that there is a reasonable probability that appropriate protective measures could be taken in their behalf in the event of a serioud accident".[2] For LACBWR, a 3-mile radius circle was used. The upgraded Radiological Emergency Response Plan[1] now defines the Emergency Planning Zone as a 5-mile radius surrounding the plant.

The post event plume exposure doses were calculated to determine an early notification radius.[1] The resulting calculations indicated that Environmental Protection Agency Protective Action Guidelines for sheltering (which are 20% of the levels utilized for requiring evacuation) of 1 Rem/hr whole body exposure and 5 Rems/hour thyroid exposure from iodine are not exceeded at 1-1/4 miles. 10CFR100.11.a.2 defines the low population zone as the area in which exposure for the duration of the accident does not exceed 25 Rem whole body or 300 Rem to the thyroid from iodine exposure. The LACBWR dose rates at 1-1/4 miles are below these limits; therefore, 1-1/4 miles is a conservative estimate of the low population zone.

Reasonable protective measures can be taken for all individuals within a 5-mile radius of LACBWR;[1] therefore, this requirement of SRP Section 2.1.3 is satisfied for the low population zone.

The population center distance is defined as 1-1/2 times the low Population Zone distance (10CFR 100.11.a.3) which for LACBWR is 1.67 miles. 10CFR 100.3.c restricts reactor sites so that no population center of greater than 25,000 persons should exist within this distance for the normal operating life of the plant. No population centers of greater than 25,000 people exist within approximately 18 miles of the plant and no population area within a 5-mile radius currently exceeds 1,000 individuals or has any potential to reach 25,000 in the next 30 years; therefore, this requirement is met.

We conclude that the exclusion area, low population zone and population center distances specified for LACBWR are in compliance in 10CFR100 as revised August 1, 1980.

This completes the evaluation of this SEP topic. Since the plant site conforms to current licensing criteria, no additional SEP review is required.

REFERENCES

(1) "Upgraded Radiological Emergency Response Plan", docketed to the U. S. Nuclear Regulatory Commission, April 2, 1981, DPC Letter LAC-7446, Linder to Eisenhut.

(2) "La Crosse Boiling Water Reactor Safeguards Report (ACNP-65544)", prepared for the United States Atomic Energy Commission under AEC Contract No. AT(11-1)-850, revised August 1967 by the Atomic Energy Division of Allis-Chalmers.

LA CROSSE BOILING WATER REACTOR

SYSTEMATIC EVALUATION PROGRAM

SAFETY EVALUATION REPORT

TOPIC II.3.A

HYDROLOGIC DESCRIPTION

The safety objective of this topic is to insure that an adequate hydrologic description of the site exists. This enables review of other SEP topics to be measured against the water levels listed in this topic. This review was conducted in accordance with the guidance given in NUREG-75/087, "Standard Review Plan", Section 2.4.1, "Hydrologic Description".

The reactor site is in the Mississippi River valley. In the vicinity of the site, this valley is deeply cut into highly dissected uplands. From La Crosse to Prairie du Chien, the valley varies between 2-1/2 and 4-1/2 miles in width. The valley walls rise sharply 500 to 600 feet from river level.[1]

There is little or no agricultural use of the river valley floor, which consists primarily of marshy land, islands between river channels, and extensions of a low-lying flood plain cut by ponds, sloughs, and meandering stream channels. Numerous short, steep-sided valleys that have been cut into the uplands by tributary streams intercept the main river valley. The valley walls of both the main and tributary channels are wooded. The flat upland areas and some of the tributary valleys are cultivated and grazed.[1]

The main channel of the river varies greatly in width above and below the site. A series of dams are operated by the U. S. Army Corps of Engineers for navigational purposes. Above dam No. 8 (about 3/4 mile north of the site), the river is nearly four miles wide. Between dam No. 8 and the site, the river is 1500 to 2000 feet wide. Below the site, the river is relatively narrow for a distance of 20 miles, then gradually widens as the river approaches dam No. 9, 33 miles south of the site.[1]

The site is on a filled-in area south of the Genoa steam plant. Therefore drainage at the site must be provided. There is allowance for runoff from the high valley walls to the east. The site is favorably located with respect to this runoff, however, because of

two short valleys east of the bluffs bordering the site. One valley drains to the north and one to the south, so that only precipitation that falls on the bluff adjacent to the site and on a small portion of the upland area contributes to runoff directly across the site. This runoff is presently channeled along the highway and railroad to prevent interference with traffic.[1] No problems of flash floods have occurred at the site.

For a distance of 40 miles downstream of the site, virtually all municipal water supplies for cities and towns along the river are obtained from ground water. On the basis of readily-available published records, the nearest major city using the river water for direct human consumption is Davenport, Iowa, about 195 miles downstream. The nearest user of river water for industrial purposes is the steam-power plant in Lansing, Iowa, about 15 miles doenstream. River water is used at this plant for condenser cooling. There is no other known user of river water for industrial purposes between the reactor site and Prairie du Chien, 40 miles down-river.[1]

The latest data on floor magnitude and frequency is a 1979 U. S. Army Corps of Engineers document.[2] The determined magnitudes and frequencies are:

Flood Return Frequency	Flow (Cubic Feet Per Sec.)	Elevation (Feet Above MSL)
5 Year	134,000	--
10 Year	161,000	--
50 Year	224,000	635.2[1]
100 Year	254,000	637.2
500 Year	321,000	640.0

The normal water elevation is identified as 620.0' MSL with the low water level at 615.4' MSL. The site fill is at 639' MSL (Fig. 3.3). The overall average annual flowrate (1930-1955 at La Crosse, Wisconsin) is 27,970 cfs.

The drainage area of the Genoa reactor site is 64,700 square miles.[3]

Structures containing safety-related equipment are listed below, together with their floor elevation. There are no openings below grade which would contribute to significant flooding due to the presence of ground water. The base of the reactor containment vessel is located below grade, however, since it is designed as a pressure vessel, it is watertight, and its entrance and emergency airlocks are installed above 640' MSL. The gas storage vaults and pipe tunnel from the Turbine Hall to the Reactor Building are also below grade. The flooding of the pipe tunnel and gas storage vaults if experienced would not impair safe shutdown of the plant.

Structure	MSL Level	Reference Drawing
Turbine Building	640'0"	Sargent & Lundy B-6 - Ground Floor Framing Plan LACBWR Generator Plant
Crib House	640'0"	Sargent & Lundy B-37 - Crib House Foundation Plans LACBWR Generator Plant
1B Emergency Diesel Gererator	641'0"	Sargent & Lundy A-1 - Diesel Generator Building Floor and Roof Plans

As much equipment is on pedestals, the use of floor elevations is conservative. The 1965 flood which reached 638.2 feet MSL is considered at least a 200-year flood.[2] The facility, while not operational at that time, was constructed. The warning available to the facility of flood cresting is 4-5 days following crest at Minneapolis, Minnesota.[4] No major water infiltrations occurred at the site and had the plant been operational, shutdown would not have been required. Based on the hydrologic projections of the U. S. Corps of Engineers,[2] it is evident that LACBWR's interface with the hydrosphere is of adequate design to protect against major river flooding. Actual experience in a 200-year flood indicates a very adequate margin for plant safety.

We conclude that the plant site adequately reflects a proper design to protect against floods of long return periods and that the hydrologic description provided is adequate. This completes the evaluation of this SEP topic.

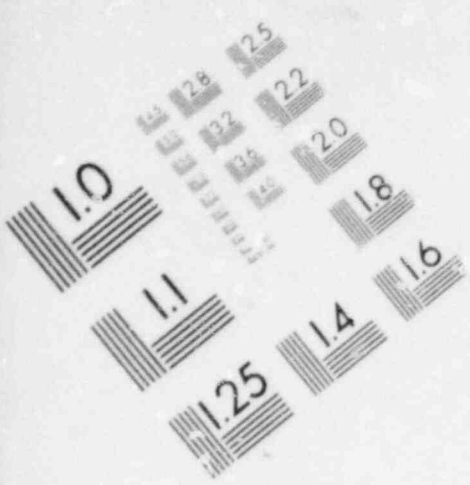
REFERENCES:

(1) "La Crosse Boiling Water Reactor Safeguards Report (ACNP-65544)," prepared for the United States Atomic Energy Commission under AEC Contract No. AT(11-1)-850, revised August 1967 by the Atomic Energy Division of Allis-Chalmers.

(2) "Upper Mississippi River Water Profile River Mile 0.0 to River Mile 847.5", by Servier, November, 1979, prepared by the U. S. Army Corps of Engineers for the Technical Flood Plane Management Task Force of the Upper Mississippi Basin Commission, as interpreted by Warren Gebert, U. S. Geological Survey, Madison, Wisconsin to John Parkyn, Dairyland Power Cooperative, April 30, 1981, by phone.

(3) U. S. Department of Interior, Geological Survey Water Resources Division, "Geology and Hydrology of a Reactor Site Near Genoa, Vernon County, Wisconsin", by Alfred Clebsch, Jr., and Eric L. Meyer, August 1962.

(4) U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, La Crosse, Wisconsin Office, Bruce Zimmerman to John Parkyn, Dairyland Power Cooperative, June 15, 1981, by phone.



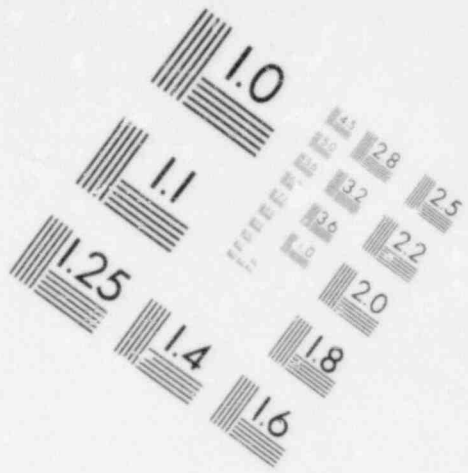
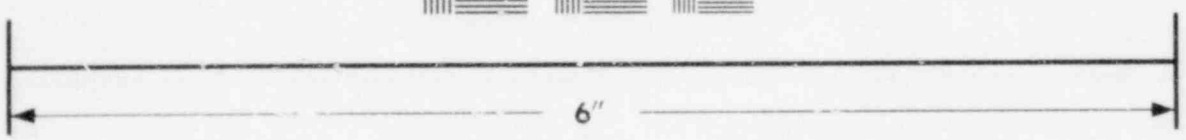
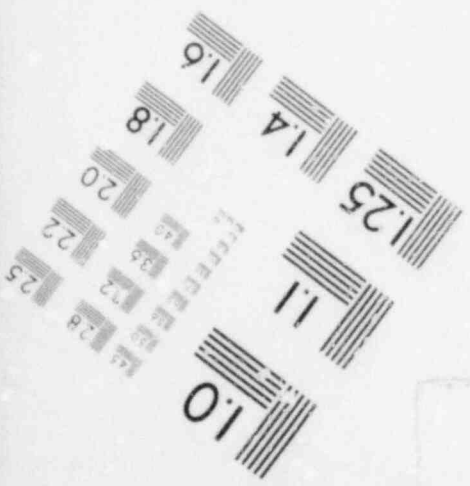
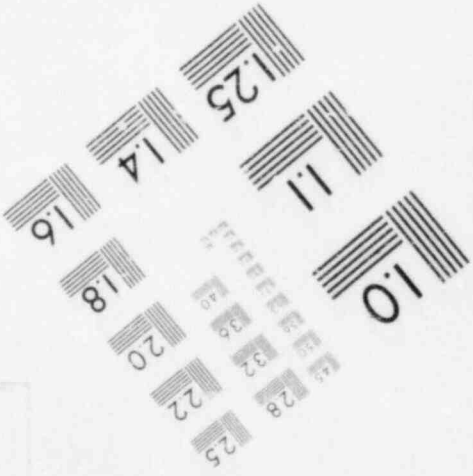
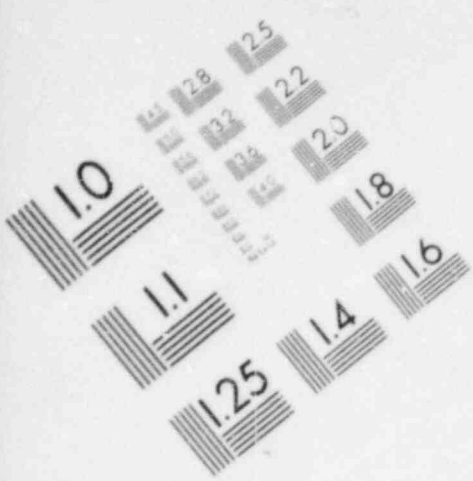


IMAGE EVALUATION
TEST TARGET (MT-3)









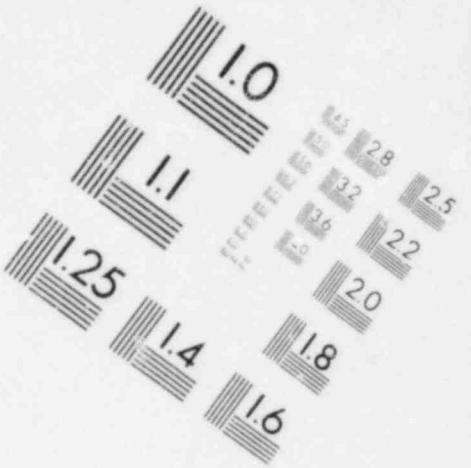
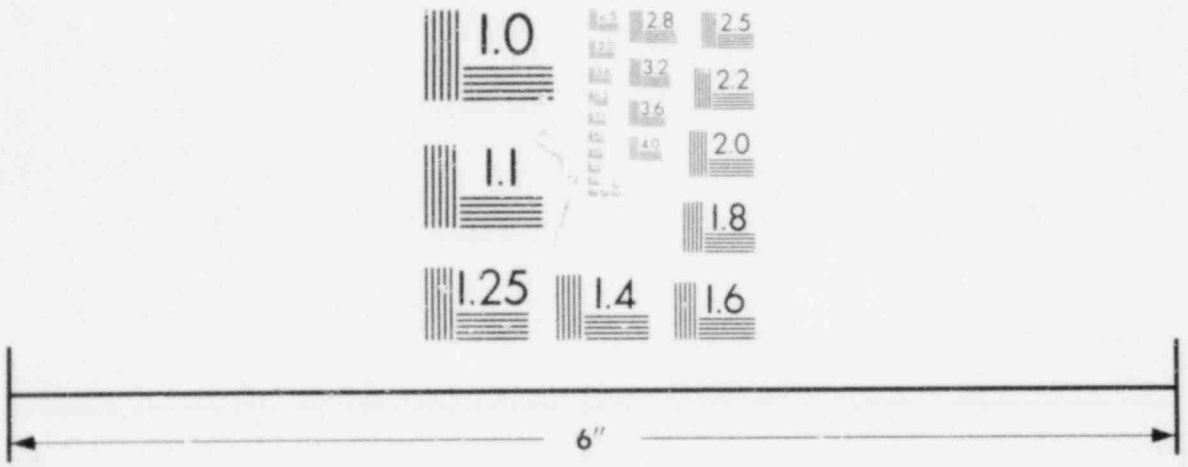
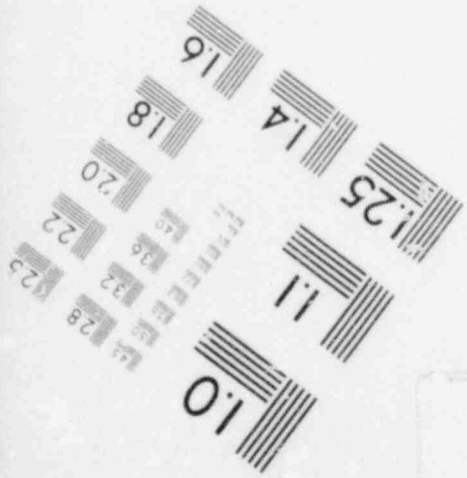
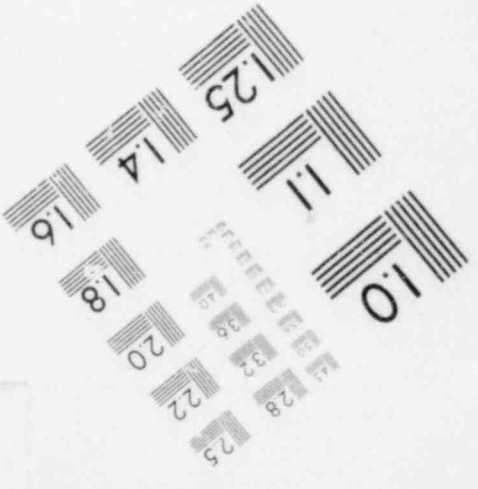
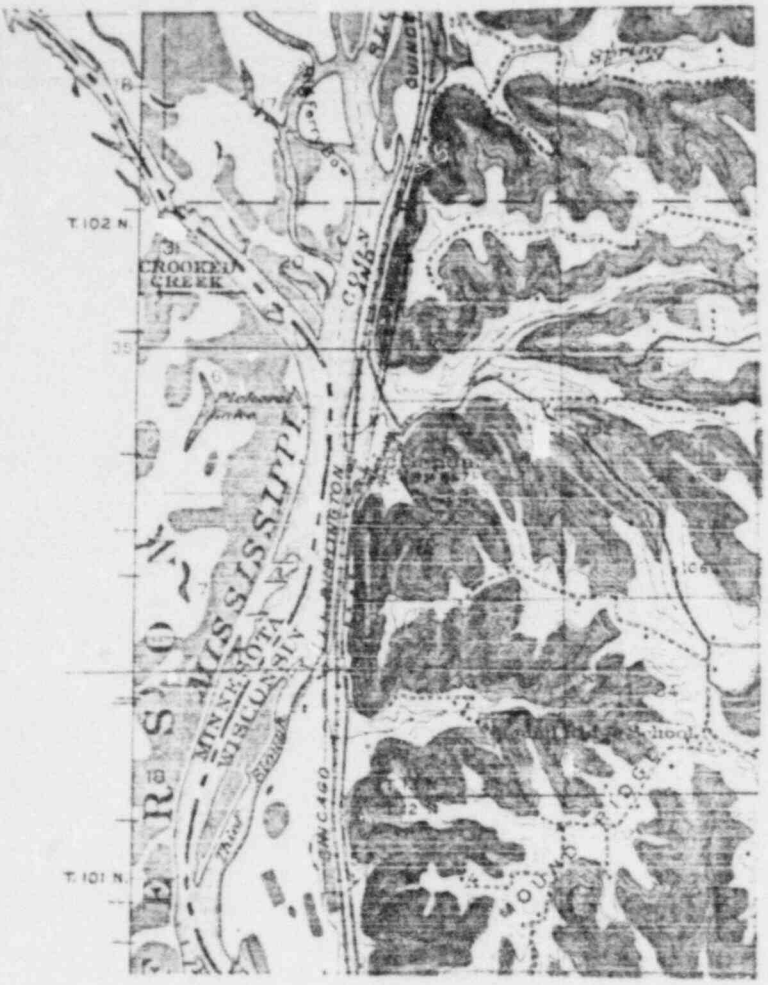


IMAGE EVALUATION TEST TARGET (MT-3)





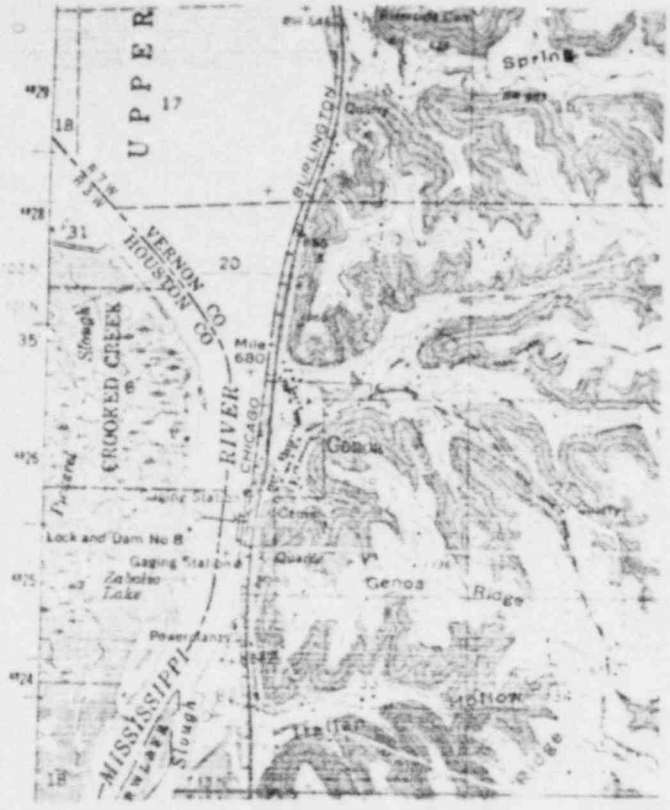




Site Topography prior to installation of U. S. Lock & Dam No. 8 at Genoa, Wisconsin and fill for site of La Crosse Boiling Water Reactor 3/4 miles south of Genoa.

U. S. Geological Survey Topographical Map - 15 Minute - Stoddard, WI - Minnesota - Iowa.

N4330 - W9100/15 - 1924.



Site Topography after installation of
U. S. Lock & Dam No. 8 and the fill for
the La Crosse Boiling Water Reactor.

U. S. Geological Survey Topographical Map -
15 Minute - Stoddard, WI - Minnesota - Iowa.

N4330 - W9100/15 - 1965.