



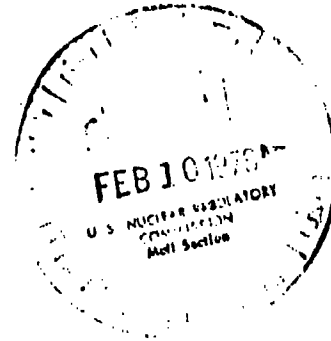
Consumers
Power
Company

REGULATORY DOCUMENT FILE COPY

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 617 788-0850

February 8, 1978

Director of Nuclear Reactor Regulation
Att: Mr Don K Davis, Acting Branch Chief
Operating Reactors Branch No 2
US Nuclear Regulatory Commission
Washington, DC 20555



DOCKET 50-155 - LICENSE DPR-6 -
BIG ROCK POINT PLANT -
SITE METEOROLOGY

In late December 1977, discussions were held with your staff concerning site meteorology and the Emergency Plan for the Big Rock Point Plant. Based on these discussions, several areas requiring further amplification were identified. Included below are the items addressed and Consumers Power Company responses.

Item

It is the intention of the NRC staff to use atmospheric effluent data over the period 1972 through 1977 as source term to project future off-site doses with respect to 10 CFR 50, Appendix I.

Response

It is Consumers Power Company's position that effluent releases prior to 1976 are not applicable to future release rates. It is apparent that even the 1975 effluent data used in our June 4, 1976 Appendix I submittal is excessively conservative with respect to more recent years. Release rates have diminished progressively as indicated by Figure I due to fuel improvements and operational changes. These changes were described on Pages A-1 and A-2 of our original submittal and are updated in Table I, attached.

It is requested that the staff reconsider the use of data prior to 1976 and that the more appropriate 1976-1977 effluent release values be utilized for Appendix I calculations since, with the continued long-term reduction in effluent release, 1976-1977 values are expected to prove higher than the mean for future plant operation to end-of-life values. Thus, the recent data is considered realistically conservative and in conformance with Appendix I criteria.

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Item

Is meteorological monitoring, similar to the Big Rock Point preoperational system, required to confirm compliance with Appendix I effluent release criteria?

Response

It is Consumers Power Company's position that monitoring is not required. This is based on two factors. First, Appendix I requires that "design basis annual quantities" of various radionuclides be established for each nuclear site, based either upon realistic or conservative dose calculations. Conservative methods were used, as documented in our June 4, 1976 submittal, and proposed Technical Specifications have been submitted based upon conservatively calculated design basis annual quantities. Second, gaseous releases are demonstrated to be extremely stable over operating intervals, intervals which are long relative to significant changes in meteorological conditions. This stability is illustrated in Figures II and III. Figure II shows daily and weekly off-gas emissions for 1976 and 1977. Figure III indicates off-gas release over a typical 24-hour period. Constancy of release rate is noted over both the long and short term. Thus, annual average meteorology is fully applicable for description of gaseous radionuclide behavior and off-site dose analysis as set forth in 10 CFR 50, Appendix I.

Item

Does the meteorological data collection period (upon which the Appendix I submittal was based) represent long-term conditions in the vicinity of Big Rock Point?

Response

The on-site measurement program utilized spanned the period February 9, 1961 through February 8, 1963. This 24-month period was compared to long-term conditions (1940-1969) at each of the three nearest National Weather Service Stations.⁽¹⁾ These stations are East Jordan, 14 miles southeast; Traverse City, 45 miles southwest; and Pellston, 24 miles northeast of the plant. All three stations are second order stations. The first order stations are too far away to be considered as being in the same Michigan climatic division.⁽²⁾

Figures IV through VI present the mean monthly temperature and one standard deviation as compared to the 24-month period for each of the three stations. The figures show that the fluctuations in extremes are lower at East Jordan and Traverse City which are closer to water bodies (as is Big Rock) than Pellston which is inland.

In general, the 24-month period of study has shown good correlation with the 30-year average, and is representative of long-term conditions in the vicinity of Big Rock Point.

References:

- (1) US Department of Commerce, 1971: Climatological Summary, Climatology of the United States No 20-20, East Jordan, Pellston and Traverse City, Michigan, National Oceanic and Atmospheric Administration, Environmental Data Service, Asheville, North Carolina.
- (2) Michigan Weather Service, 1974: Climate of Michigan, Michigan Department of Agriculture, Lansing, Michigan.

David P. Hoffman for

William S Skibitsky
Senior Licensing Engineer

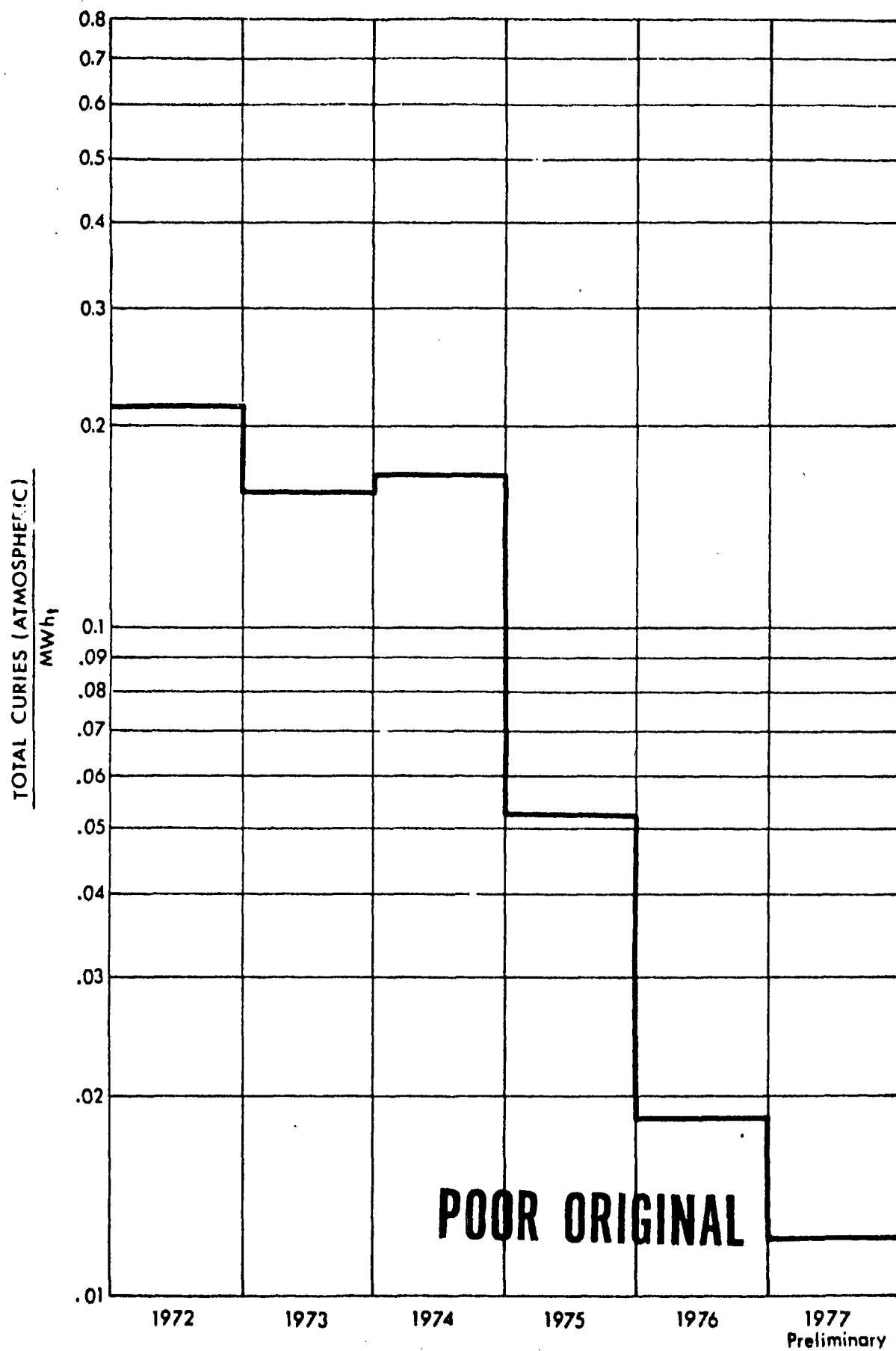
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TABLE I

CHANGES WHICH HAVE AFFECTED THE BIG ROCK SOURCE TERM

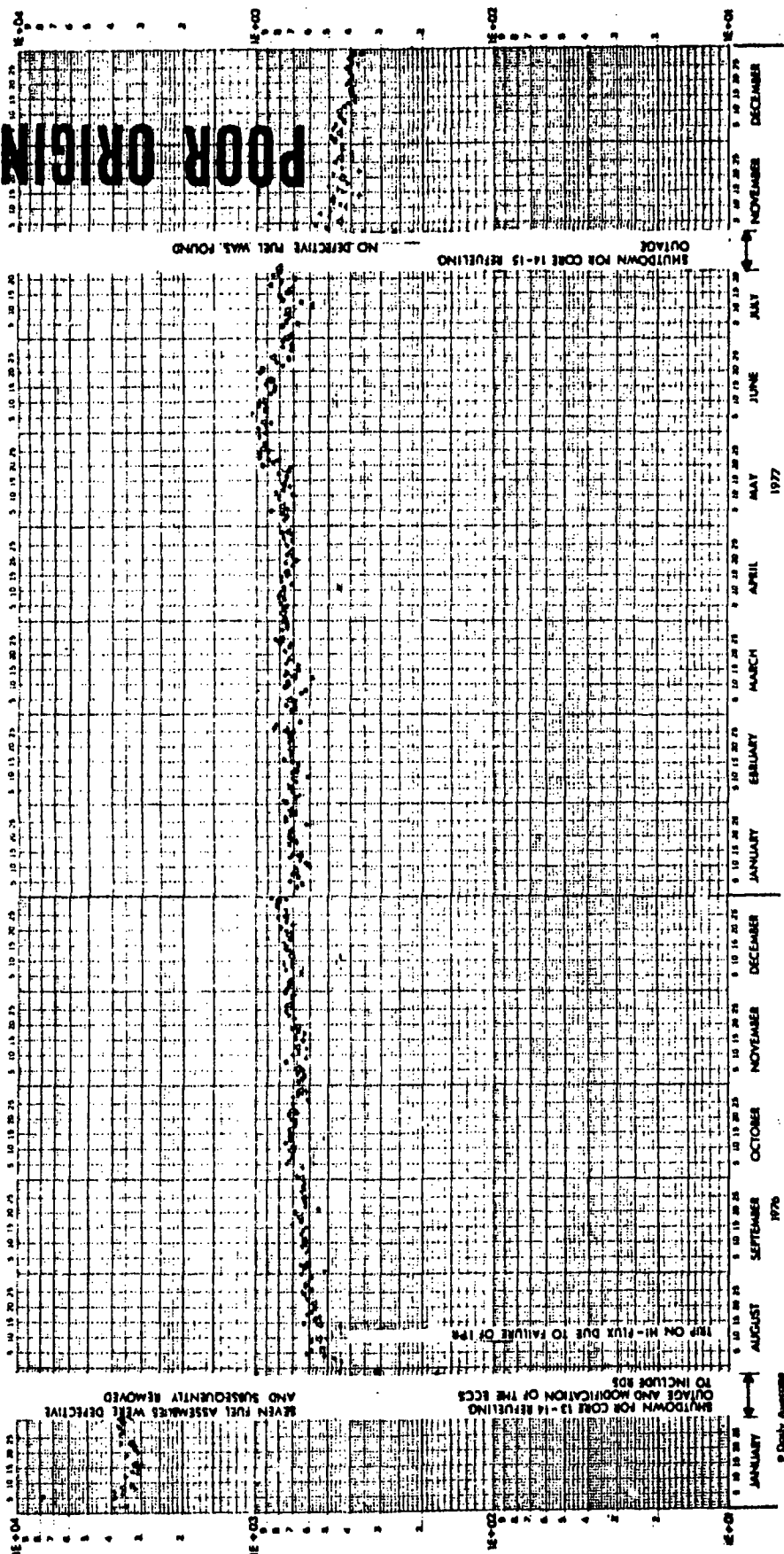
Through 1967	Changed from mixed fuel cladding types to 100% Zircaloy clad.
1968	High and low pressure feedwater heaters (70% Cu, 30% Ni) replaced with stainless steel.
1969 - 1973	Mixed oxide recycle performed at 12-13 kg per core.
1971 & 1972	Fuel channels modified for improved coolant distribution and reduced crud deposition.
1972	Cleanup system heat exchangers (70% Cu, 30% Ni) replaced with stainless steel.
1973	Changed six fuel bundles to 11 x 11 array from original 9 x 9 - provides approximately 20% increased heat transfer from rods.
1968 - 1975	New fuel impurity levels decreased - hydriding lowered.
1974	Continued changeover to 11 x 11 arrays for a total of 18 such bundles. Increased mixed oxide loading to 38 kg.
July 1974	Startup power ramping limited to 3% per hour to reduce fuel pellet/cladding interaction.
1974 - 1975	ECCS "final acceptance criteria" limits maximum power in fuel bundle. Increased 11 x 11 arrays to approximately 75% of core. Mixed oxide loading increased to approximately 50 kg.
1976 - 1977	Following vendor's PCIOMR (fuel preconditioning) recommendations on startups.
1978 & beyond	Completing changeover to 11 x 11 arrays.

BIG ROCK POINT PLAI



II. INTRODUCTION

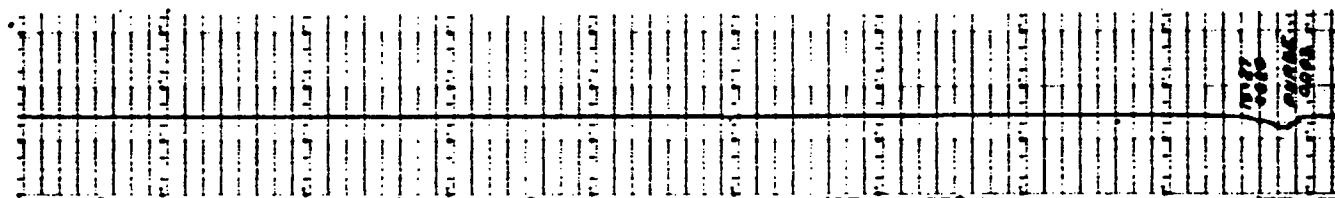
**BIG ROCK POINT PLANT
OFF GAS 1976 - 1977**



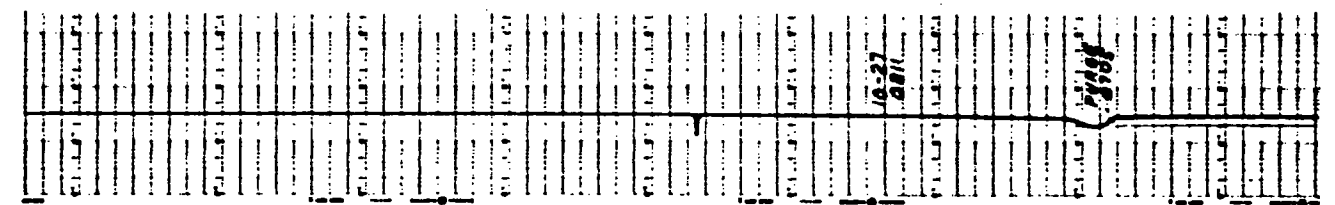
BIG ROCK POINT PLANT

TYPICAL OFF GAS RELEASE RATES FOR 24-HR PERIOD

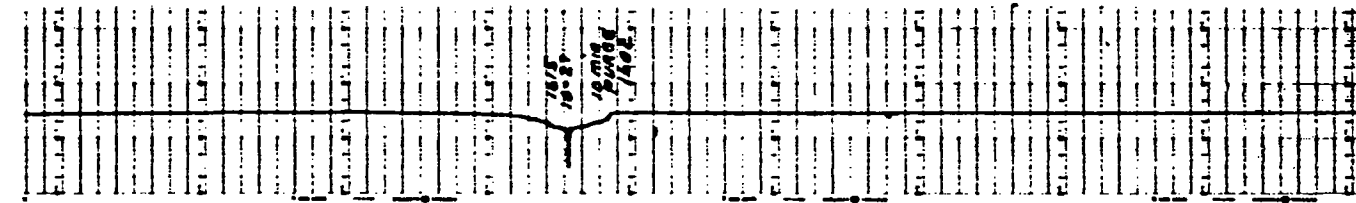
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μCi/sec
3000
250
23



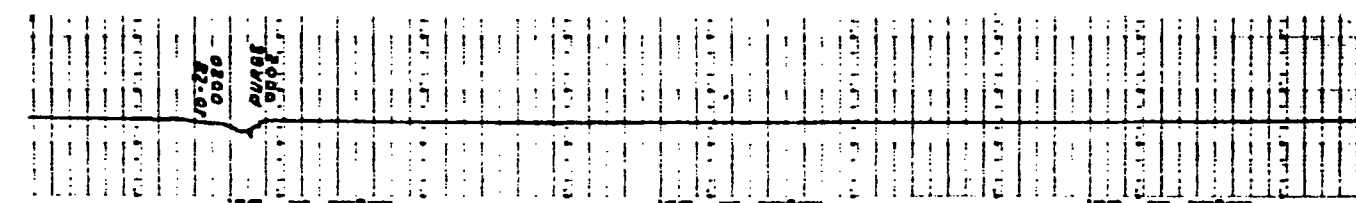
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10-27-76 10-27-76
μCi/sec
3000
250
23



1841 1219
10-27-76 10-27-76
μCi/sec
3000
250
23



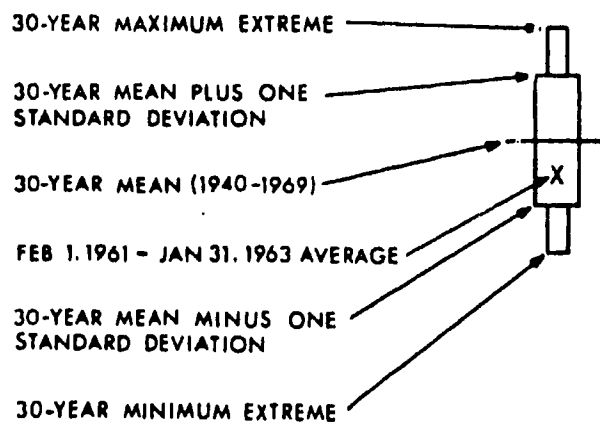
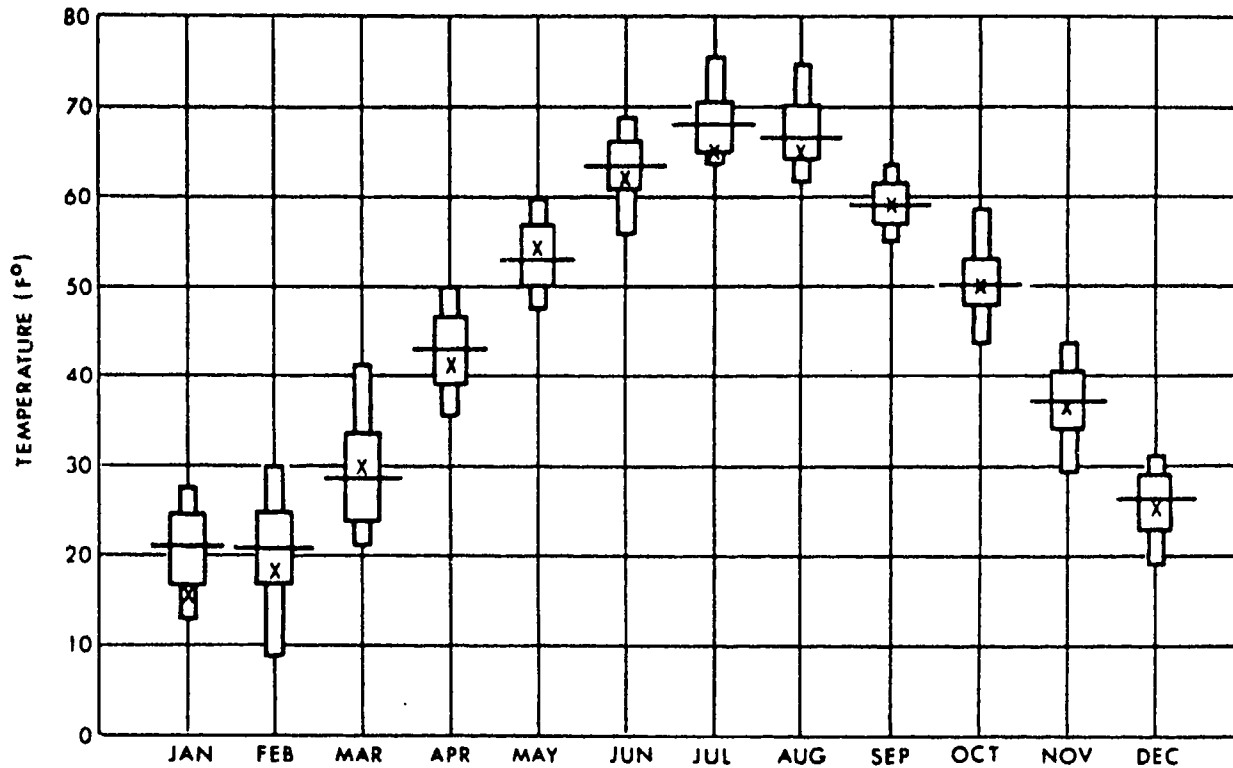
0110 1841
10-28-76 10-27-76
μCi/sec
3000
250
23



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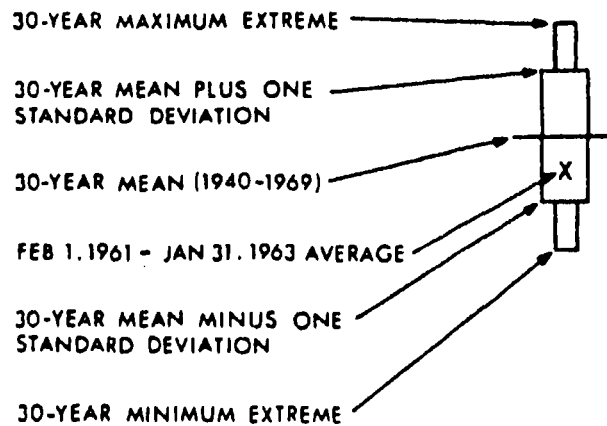
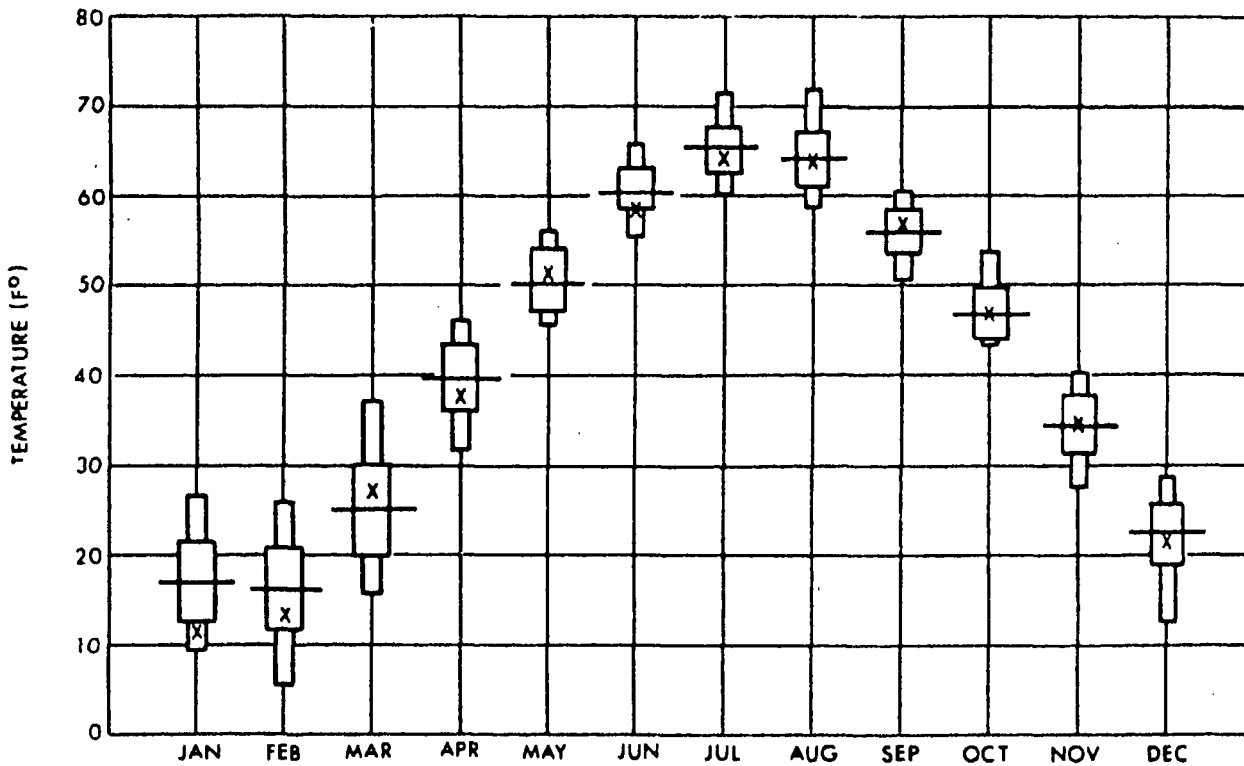
BIG ROCK POINT NUCLEAR PLANT

Comparison of Monthly Average Temperatures at East Jordan



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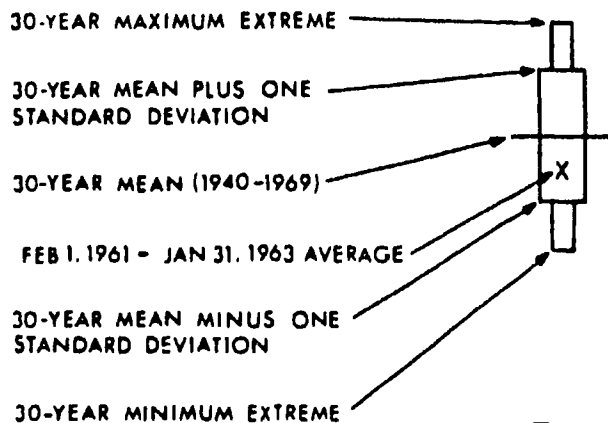
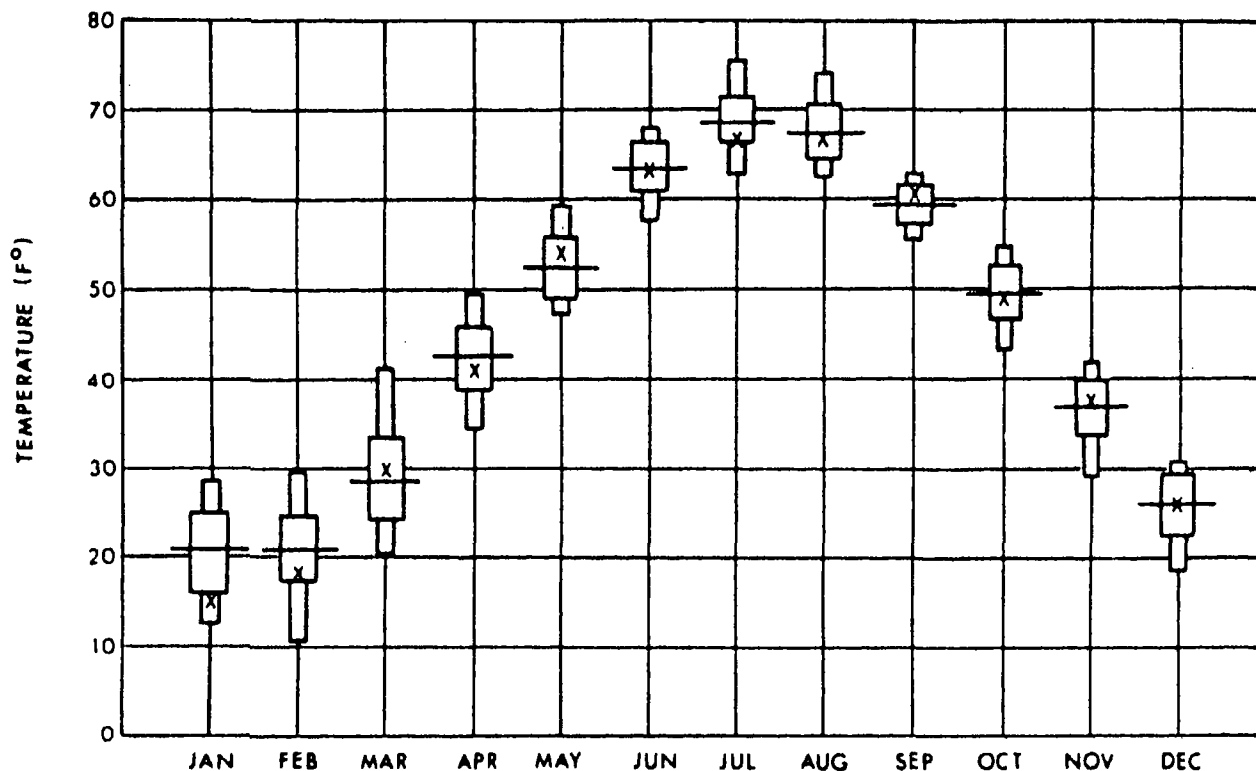
BIG ROCK POINT NUCLEAR PLANT Comparison of Monthly Average Temperatures at Pellston



POOR ORIGINAL

FIGURE VI

BIG ROCK POINT NUCLEAR PLANT Comparison of Monthly Average Temperatures at Traverse City



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