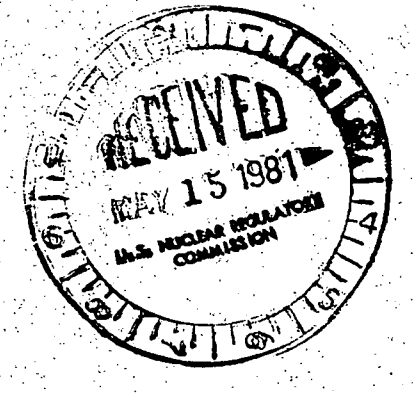
UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 13, 1981

Docket Nos. 50-155/255
LS05-81-05-018



Mr. David P. Hoffman
Nuclear Licensing Administrator
Consumers Power Company
1945 W. Parnall Road
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Dear Mr. Hoffman:

SUBJECT: SEP TOPIC II-1.C, POTENTIAL HAZARDS DUE TO NEARBY INDUSTRIAL, TRANSPORTATION AND MILITARY FACILITIES (BIG ROCK POINT AND PALISADES)

By letters dated November 27, 1979 and June 6, 1980 we forwarded to you copies of our safety evaluation for SEP Topic II-1.C for Palisades and Big Rock Point, respectively. Your response to both evaluations indicated that you had no comments and therefore the topic is assumed to be complete.

Since the evaluations were issued we have deleted SEP Topic VI-8, "Control Room Habitability" from the SEP program. Since the evaluation for Topic II-1.C refers to topic VI-8, we have revised the topic assessments to reflect this fact. Both assessments now refer to the NRC TMI Task Action Plan, Task III.D.3.4 which has taken precedence over Topic VI-8.

In addition, the Palisades review indicated a concern for the potential expansion of the South Haven Municipal Airport. Since the airport expansion issue was addressed in the recent evaluation of Topic III-4.D, "Site Proximity Missiles" dated January 13, 1981, we have removed the open item from Topic II-1.C.

Also, the Big Rock Point evaluation indicated that an open item existed concerning the capability of the plant to withstand an explosive shipment detonation. We have reviewed our original evaluation and determined that since the distance from the transportation route to the plant exceeds the minimum distance criteria the plant meets the current criteria. Accordingly we have removed the indication of an open item.

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Since both evaluations were final, and only minor changes have been made regarding the closure of open items and no factual information has changed, we regard the assessments as final. No response from you regarding these evaluations is necessary.

Sincerely,

Dennis M. Crutchfield

Dennis M. Crutchfield, Chief
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Enclosure:
As stated

cc w/enclosure:
See next page

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BIG ROCK POINT

Topic II-1.C - Potential Hazards Due to Nearby Industrial, Transportation, and Military Facilities

The safety objective of this topic is to assure that the nuclear plant is adequately protected and can be operated with an acceptable degree of safety with regard to potential accidents which may occur as the result of activities at nearby industrial, transportation, and military facilities. The review was conducted in accordance with the guidance of SRP's 2.2.1, 2.2.2 and 2.2.3.

Industrial activity in the vicinity of the Big Rock Point plant consists primarily of small manufacturing companies. There are also some cement plants and quarries in the area. The closest industrial facility is a manufacturing plant located about one mile east where 105 employees are engaged in producing custom molded plastic fixtures. An inventory of approximately 100,000 pounds of thermoplastic materials is stored at the facility.(1) These materials are not an explosive hazard but could produce toxic combustion products if a fire should occur. The severity of this event with regard to safe operation of the nuclear plant, in particular, the habitability of the control room, would depend on many factors including source parameters, wind speed and direction, cloud plume rise, and protective actions taken by plant operators. Control room habitability will be evaluated as part of the TMI Task Action Plan, NUREG-0737, Task III.D.3.4. Potential problems and their solutions will be identified as part of that review, independent of the SEP program.

An industrial park is located about 2.5 miles southwest of the plant. Several light manufacturing companies employing a total of about 200 persons are

located in the park. No hazardous materials in quantities large enough to affect the safe operation of the nuclear plant are known to be processed, stored, or transported at the industrial park. An oil company storage terminal is located on US Route 31 near the industrial park. The maximum storage capacity at the terminal is approximately 46,000 gallons of fuel oil and 40,000 gallons of gasoline.(2) No propane is stored at the facility. The separation distance between the fuel storage terminal and the nuclear plant (over two miles) is considered adequate to preclude accidents at the terminal affecting the safe operation of the nuclear plant. A local planning official has stated that no additional industrial developments are proposed or planned for the area in the vicinity of the plant.(3)

The nearest highway to the plant is US Route 31 which is located 2,760 feet southeast at its closest point of approach. Shipments of explosives used in local quarry operations travel on Route 31 past the plant. The guidance of Regulatory Guide 1.91, Revision 1, was utilized to evaluate the consequences of a postulated explosive accident on the highway. Regulatory Guide 1.91, Rev. 1, has been specifically identified by the NRC's Regulatory Requirements Review Committee as one of the items to be considered for backfit on operating reactors. We find that the separation distance between the highway and the plant exceeds the minimum distance criteria given in the regulatory guide for truck-size shipments of explosive materials and, therefore, there is reasonable assurance that an explosive accident on the highway will not affect the safe operation of the plant.

We have also evaluated the potential consequences of highway accidents involving toxic chemicals. A conservative analysis indicates that certain toxic chemicals which form a gas cloud when released (e.g., chlorine, ammonia) could reach the

plant in concentrations high enough to be of concern depending on such factors as spill size and atmospheric dispersion conditions. Accident data compiled by the Michigan Department of Highways indicate that the expected frequency of an accident involving hazardous chemicals on the approximately ten-mile stretch of US Route 31 past the plant is about 1.3×10^{-3} per year.(4) The percent of tanker truck accidents which involve a significant loss of material is about 2%.(5) The percent of time on an annual basis that the wind blows from the ten-mile stretch of Route 31 toward the plant is about 51%. Thus, we conservatively estimate that the potential annual exposure rate to the plant due to toxic chemical accidents on Route 31 is about 10^{-5} per year.

The probability of toxic chemical exposure noted above is higher than the acceptance probability level used in current licensing criteria (see SRP 2.2.3). However, the calculated frequency of toxic chemical accidents on Route 31 past the plant is based on the assumption that the toxic chemical traffic on Route 31 is similar to that on other highways in Michigan. Our review of the industrial activity in the region surrounding the plant indicates a lack of industrial or chemical complexes which would generate toxic chemical traffic. Therefore, it is our judgement that the threat to the safe operation of the plant posed by highway accidents involving toxic chemicals is sufficiently remote so that such accidents need not be considered as a design basis event. If future traffic information shows an increase in toxic chemical shipments on Route 31, it will be necessary for the staff and the licensee to review the situation to determine if additional protective measures for the plant are required.

A Chesapeake & Ohio Railroad branch line runs approximately 5,600 feet south of the plant at its closest point. Information obtained from the railroad company indicates that three freight trains per week providing only local service use the line.[6] The railroad company identifies propane as the only hazardous material shipped on the line. We have evaluated the consequences of a postulated explosion on the railroad in accordance with the guidance in Regulatory Guide 1.91, Revision 1. We find that the separation distance between the railroad line and the plant exceeds the minimum distance criteria given in the regulatory guide for railroad shipments of explosive materials and, therefore, is acceptable.

The nearest pipeline to the plant is a 6-inch diameter natural gas line which is located about 1.5 miles south.[7] At this distance, pipeline accidents will not affect the safe operation of the plant, based on evaluations of pipeline accidents done in previous licensing reviews. There are no gas or oil production fields, underground storage facilities, or refineries in the vicinity of the plant.

There are no large commercial harbors near the plant but some commercial shipping does take place at Charlevoix Harbor which is approximately 4 miles southwest of the plant. While the great majority of the cargo consists of non-hazardous commodities such as coal and limestone, some gasoline and fuel oil is shipped from the harbor by barge.[8] All of the gasoline and fuel oil is loaded into barges from trucks for shipment to Beaver Island which is some 25 miles northwest of Charlevoix. Two barge line companies, each with one barge, are engaged in this trade. Between them they make about 20 trips per year and the captains estimate that they com

no closer than about three to four miles from the plant.[9] Thus, the occurrence of a barge accident with consequences severe enough to affect the safe operation of the plant is extremely unlikely and does not constitute a credible risk to the plant. Similarly, the main shipping route in Lake Michigan which is located about 40 miles northwest of the plant is not a threat to plant operation.

The nearest airport to the plant is Charlevoix Municipal Airport which is located approximately five miles southwest. The airport has one paved runway 3,500 feet in length oriented in an east-west direction and two turf runways. Charlevoix Municipal is a general avaiation facility used primarily by light single engine aircraft. There were a total of 16,800 itinerant and local operations at the field in 1976 and this is projected to increase to 71,000 operations in 1997 according to the airport master plan.[10] The master plan recommends that Charlevoix Municipal Airport should be upgraded to a basic transport facility, i.e., one capable of handling turbojet powered aircraft up to 60,000 pounds gross weight. Using the analytical model given in SRP 3.5.1.6, we conservatively calculate the the probability of an aircraft from Charlevoix Airport crashing into the Big Rock Point plant is 8.5×10^{-7} per year. Conservatisms in our calculation include the use of the projected 1997 level of operations, the assumption that all aircraft arriving or departing the airport fly over the plant area, and the consideration of the entire plant as a potential "target area". In fact, since the vast majority of aircraft operating at Charlevoix Airport are expected to be light, general aviation aircraft, only a small fraction of postulated aircraft strikes would seriously affect the safety of the plant. The probability of an accident resulting in severe radiological consequences would, therefore, be even lower than the probability value given above. We conclude that the Charlevoix Airport does not represent an undue risk to the safe operation of the nuclear plant and meets the acceptance criteria of SRP 2.2.3.

A military low level training route (IR 600/601) currently passess 6.5 miles northeast of the plant measured to the centerline of the route at its closest point of approach.(11) The route includes a radar bomb scoring range over Lake Michigan and is flown primarily by Strategic Air Command B-52s and FB-111s. No live weapons are involved in these bomb scoring runs. At the request of the staff, the U.S. Air Force undertook a study to update an earlier analysis of the risk of a military aircraft on IR 600/601 crashing into the plant. The study was based on recorded data on flight frequency, navigation error, and crash rate. The Air Force calculated that the probability of a crash at the plant (represented by a square target area 3.45 miles on a side) was approximately 10^{-8} per year.(12) The staff has reviewed the Air Force analysis and is in essential agreement with the methodology employed and the finding that a military aircraft crash at the plant is an extremely remote event. Furthermore, in the course of this review, the staff was informed by the Air Force that permission had been requested from the FAA to adjust route IR 600/601 so that in effect it would be located at a greater distance from the plant. The staff was subsequently informed that the request had been approved(13) and the Air Force expects to formally publish the new route on May 15, 1980.(14) The adjusted route will pass approximately 12 miles west of the plant. We conclude that the risk to plant safety of military aircraft on route IR 600/601 in its present configuration is acceptable and meets the acceptance criteria of SRP 2.2.3. In addition, the planned adjustment to the route will reduce the risk of a military aircraft accident at the plant to an even lower level.

We conclude that the Big Rock Point plant is adequately protected and can be operated with an acceptable degree of safety with regard to industrial, transportation, and military activities in the vicinity of the plant. We have

identified possible toxic combustion products from a fire at a thermoplastics facility located one mile from the plant as an item for further consideration in the overall evaluation of the habitability of the control room which will be done as part of the NRC's TMI Task Action Plan. This completes the evaluation of SEP Topic II-1.C.

REFERENCES

1. Personal communication with Michael Johnson of Lexalite Corporation, Charlevoix, Michigan, November 7, 1979.

2. Personal communication with Gordon Gibb, Woodland Oil Company, Charlevoix, Michigan, November 15, 1979.

3. Meeting with John Hess, Charlevoix County Planner, Charlevoix, Michigan, July 19, 1979.

4. "Analysis of Truck Accidents in Michigan", TSD-350-77, Michigan Department of State Highways and Transportation; data from Sandra Cornell, Traffic Technician, Michigan DOT, December 12, 1979.

5. "A Modal Economic and Safety Analysis of the Transportation of Hazardous Substances in Bulk," Arthur D. Little, Inc., Report No. COM-74-11271, 1974.

6. Letter from R. G. Rayburn, Vice President - Transportation, Chessie System to F. Kantor, NRC, December 6, 1979.

7. "Michigan Major Gas Pipelines and Franchise Map", compiled by Consumers Power Company, January, 1977 and "Michigan Oil Pipeline Map", Public Service Commission, Michigan Department of Commerce, July 1976.

8. Waterborne Commerce of the United States, Calendar Year 1974, Department of the Army, Corps of Engineers.

9. Personal communication with Jules Gillespie, Gillespie Oil Company, and Wayne Chapman, Midnight Oil Company, November 16, 1979.

10. Charlevoix Municipal Airport, Master Plan, prepared for the City of Charlevoix by Arthur A. Ranger, Consulting Engineer, July 1977.

11. "Area Planning, Military Training Router, North and South America", DOD Publication AP/1B, January 24, 1980.

12. Letter from Col. David L. Nichols, Deputy Director for Operations and Training, Headquarter United States Air Force, Washington, D.C. to F. Kantor, NRC, January 9, 1980.

13. Personal communication with Lee Schuldt, FAA Air Route Traffic Control Center, Minneapolis, Minnesota, February 5, 1980.

14. Personal communication with Lt. Col. James Scherer, U.S. Air Force, Barksdale Air Force Base, Louisiana, February 8, 1980.

PALISADES

Topic II-1.C - Potential Hazards Due To Nearby Industrial, Transportation, and Military Facilties

The safety objective of this topic is to assure that the nuclear plant is adequately protected and can be operated with an acceptable degree of safety with regard to potential accidents which may occur as the result of activities at nearby industrial, transportation, and military facilities. The review was conducted in accordance with the guidance of SRP's 2.2.1, 2.2.2 and 2.2.3.

There is little industrial activity in the vicinity of the Palisades plant. The nearest concentration of industrial activity is located in the South Haven city area and consists primarily of light manufacturing facilities. Regional planning officials have stated that to their knowledge no industrial developments are planned for the vicinity of the nuclear plant.(1)

The nearest transportation routes to the plant are U.S. Route 31 and Interstate 196 which pass about 3,600 feet and 4,200 feet, respectively, from the plant at their closest point of approach. The guidance of Regulatory Guide 1.91, Revision 1, was utilized to evaluate the consequences of postulated explosions on these highways. Regulatory Guide 1.91, Revision 1, has been specifically identified by the NRC's Regulatory Requirements Review Committee as needing consideration for backfit on operating reactors. We find that the highway separation distances at Palisades exceed the minimum distance criteria given in the regulatory guide and, therefore, provide reasonable assurance that transportation accidents resulting in explosions of truck-size shipments of hazardous

materials will not have an adverse effect on the safe operation of the plant.

Highway accidents involving certain hazardous chemicals could theoretically exceed toxicity limits in the plant control room assuming an optimum set of spill parameters and atmospheric dispersion conditions. However, the highway separation distances and the lack of any indication of frequent shipment of hazardous chemicals past the plant in conjunction with the prevailing wind patterns in the area provide reasonable assurance that the likelihood of a hazardous chemical spill affecting the operation of the plant is low. We are, however, unable to say precisely what the probability of a hazardous chemical accident is because detailed information on the size, type, and frequency of hazardous chemical shipments past the plant is not available. Control room habitability will be evaluated as part of the TMI Task Action Plan, NUREG-0737, Task III-D.3.4. Potential problems and their solutions will be identified as part of that review, independent of the SEP program.

The nearest railroad other than the spur line serving the plant is the Chesapeake & Ohio line about 2 1/4 miles to the east. At this distance, potential railroad accidents involving hazardous materials are not considered to be a credible risk to the safe operation of the plant.

The nearest large pipelines to the plant lie in a corridor about three miles southeast. These pipelines include a 30-inch diameter natural gas pipeline and a 10-inch diameter petroleum products pipeline. These pipelines are far enough removed to assure that pipeline accidents will not

affect the safety of the nuclear plant. There are no gas or oil production fields, underground storage facilities, or refineries in the vicinity of the plant.

There are no large commercial harbors along the eastern shore of Lake Michigan near the plant. Some freight including fuel oil is shipped through St. Joseph harbor about 17 miles to the south. Major shipping lanes in the lake are located well off-shore, at least 10 miles or more, from the plant.(2) Thus, lake shipping is not considered to be a hazard to the plant.

The closest airport to the plant is South Haven Municipal Airport, a general aviation facility located approximately three miles northeast. Ross Field in Benton Harbor, about 15 miles south of the plant, is the nearest airport with scheduled commercial air service. Low altitude federal airways V193 and V55 pass about four miles northwest and ten miles east of the plant site, respectively. There are no military training routes within 30 miles of the site. Of the aviation facilities in the area, only South Haven Airport is of concern to the plant.

South Haven Airport has one paved runway and three turf runways. The paved runway, designated 4-22 and thus oriented in a northeast-southwest direction, is 3485 feet long and 50 feet wide. The airport is classified by the Federal Aviation Administration as a basic utility airport which indicates that it can accommodate about 95% of the general aviation propeller fleet under 12,500 pounds. The main runway is equipped with medium intensity runway lights. The airport has instrument approach capability consisting of a straight-in approach to runway 22 from the Pullman VORTAC

which is located six miles northeast of the field. There is no control tower at South Haven Municipal. The airport is used for general aviation activities such as business and pleasure flying and for agricultural spraying operations. There are currently about 20,000 operations* per year at the facility and 12 to 15 based aircraft exclusive of aircraft used for crop dusting.[3,4] The great majority of the aircraft are single-engine propeller airplanes which typically weigh on the order of 1,500 to 2,000 pounds.

The regulatory staff, based on evaluation performed in several licensing reviews, has concluded that nuclear power plant structures which are designed to withstand tornado missiles and other design loads can withstand the collision forces imposed by light general aviation aircraft without adverse consequences. Safety-related equipment located outside of such structures, however, would be vulnerable to a light airplane crash. Employing the analytical model given in SRP 3.5.1.6, we estimate, on a conservative basis, that the overall probability of a light aircraft striking such equipment at the Palisades plant for the present level of operations is about 1.55×10^{-7} per year which is considered acceptable based on the criteria given in SRP 2.2.3. For further information regarding aircraft see Topic III-4.D, "Site Proximity Missiles" for the Palisades Plant.

*An operation is defined as either a takeoff or a landing; a "touch-and-go" would be counted as two operations.

We conclude that the Palisades Plant is at present adequately protected and can be operated with an acceptable degree of safety with regard to industrial and transportation activities in the vicinity of the plant. The effect of outside activities on the habitability of the control room will be evaluated as part of the TMI Task Action Plan.

REFERNCES

1. Meeting with John P. Zook and William M. Gebhard, Senior Planners, Southwestern Michigan Regional Planning Commission, St. Joseph, Michigan, July 17, 1979.

2. "Hazard Analysis, Michigan", prepared by Michigan Department of State Police, Emergency Services Division, May 1974.

3. Personal Communication with Edward A. Mellman, Manager, Aviation Planning Section, Michigan Department of Transportation, September 11, 1979.

4. Personal communication with Robert L. Mueller, Airport Manager, South Haven Municipal Airport, September 20, 1979.