UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

MAY 11 1971

Mr. Edward J. Bauser
Executive Director
Joint Committee on Atomic Energy
Congress of the United States

Dear Mr. Bauser:

Recent discussions between representatives of the AEC regulatory staff and the Department of Defense have developed additional information on low-level military training flights. This information concerns events following the recent B-52 crash near the Big Rock Point nuclear power station in northern Michigan both with respect to the Bayshore training route near the Big Rock Point plant and the more general possibility of low-level military flights near nuclear installations throughout the country.

Subsequent to the crash of a B-52 bomber about six miles from Big Rock Point a series of meetings with DOD representatives was initiated through the office of the Military Liaison Committee to explore the question of low-level flights by military aircraft near nuclear installations. A letter to Chairman Seaborg dated March 1, 1971, from Mr. Ralph Nader and Chairman Seaborg's reply dated March 22, 1971, with respect to this matter and with respect to the proximity of commercial airports to nuclear power plant sites were previously transmitted to you by letter dated April 1, 1971. As noted in our reply to Mr. Nader, the proximity of the Air Force's Bayshore bomb scoring site to the Big Rock Point plant near Charlevoix, Michigan, and the associated use of the plant in connection with training flights, came to the attention of the AEC in 1963. At that time it was the AEC's understanding that the plant was being used as a practice target and the AEC requested the Air Force to remove the plant from their practice target list. The AEC's Division of Military Application determined from the Air Force that the plant would not be used for this purpose. We were subsequently informed by DOD that the use of the plant as a practice target had been discontinued in 1963 but that low-level flights near the plant continued with the targets for these runs being in Lake Michigan, several miles offshore.

Subsequent to the January 7, 1971 crash, low-level training flights on the Bayshore route were suspended and SAC formally closed the route to low-level training missions on January 15, 1971.

The regulatory staff met with DOD representatives on February 3, 1971, and April 6, 1971, and in the latter meeting Air Force representatives proposed, for AEC and Consumers Power Company concurrence, an alternate flight path in the Bayshore area that would route low-level flights along a centerline about 5-1/2 miles east of the plant, with a return path to the entrance of the bomb-scoring run passing about 12 miles west of the plant. (The centerline of the previous route was 3000 feet west of the plant with the planes at an altitude of about 1750 feet as they left the off-shore scoring area.) The proposed flight path zone would be 8 miles wide (4 miles on either side of the centerline); therefore planes could approach to within 1-1/2 miles of the Big Rock Point plant. However, we understand that the Air Force proposes to abort and redirect any training flights approaching the zone boundary in the Bayshore target area.

We have asked the Air Force representatives for a letter which would provide information on this alternate route, including statistics on the deviation of aircraft from the nominal flight path during such training missions. On the basis of this information we hope to be in a position to agree with the Air Force that the probability of a crash at the Big Rock Point plant as a result of low-level training flights on this alternate route would be negligible.

We understand that because of a loss of target flexibility associated with the alternate route that this change of route would be only an interim measure and that a new scoring area more than 10 miles west of the plant would be required to restore adequate target flexibility. This long-range proposal requires clearance from the FAA and would entail movement of radar tracking facilities from the present Bayshore location.

With regard to the general problem of low-level military flights, the staff has provided Air Force representatives with a list of site coordinates for licensed nuclear power plants and test reactors. We have received DOD Flip Low Altitude High Speed Training Route Charts for the contiguous States and Puerto Rico. On the basis of a preliminary examination of these charts, it appears that only one other nuclear facility site, Arkansas Nuclear One in northwestern Arkansas, is near a low-level bomber training route similar to the Bayshore route. This facility is more than 5 miles from the nearest edge of the flight zone and should therefore not be subject to regular overflights.

The DOD charts also indicate about 250 other low-level military training flight paths for aircraft in the United States. Our preliminary examination of these routes indicates that about one-third of the nuclear power reactor sites are within about 10 miles of one or more of these routes. After receiving statistical information from the Air Force on the deviation

of aircraft from the nominal flight path on these routes, the frequency of use of these routes, and relevant crash statistics, we will be in a better position to evaluate changes, if any, which may be desirable in current military training routes. (A simple instruction from DOD to all flying commands to instruct air crews to avoid the locations of nuclear power plant sites may be sufficient action in this matter.) The DOD has indicated that if formal route changes are required, the FAA will necessarily have to be consulted.

We plan later to notify all power and test reactor licensees of the ultimate results of these efforts and ask that they notify us of any unusual overflight conditions that arise in the future at their plants.

Of course military overflights are not the sole consideration in evaluating potential aircraft hazards. Commercial and general aviation overflights and the proximity of airports are also of concern. In the course of our past evaluations of nuclear power facilities we have not considered that the hazards from these aircraft overflights warrant special measures when the facilities are not in the immediate vicinity of airports since statistics available on civilian and general aviation crashes indicated a very low probability of striking any given point near air corridors. We have concluded, however, that the area immediately around airports has a significantly higher crash probability, especially within the first two miles, and have had under development for some time explicit criteria concerning the design and location of nuclear power plants in relation to nearby airports. A copy of these criteria will be sent to you before publication for comment. As noted in Chairman Seaborg's letter to Mr. Nader, the Commission will also consider holding public hearings on the criteria at the time they are ready for publication.

Sincerely,

/s/

Harold L. Price
Director of Regulation

EMO ROUTE SLIP
93 (Rev. May 14, 1947) AECM 0240

☐ See me about this.	☐ For concurrence.	☐ For action.
☐ Note and return.	☐ For signature.	☐ For information.

me and unit) E. L. Price C. Beck M. Mann S. Hammer C. Henderson	INITIALS DATE	REMARKS Here are two replacement pages to the enclosure to the AF's letter to Jim Campbell of Consumers (See my 5/4/71 buckslip). Charles MacVean has asked that the original pages be destroyed. He also has indicated that the letter to Campbell is
TO (Name and unit) E. Price R. Case L. Lee bcc: B. Grimes D. Eisenhut	INITIALS DATE	REMARKS expected to be signed out today or tomorrow.
TO (Name and unit) D. Skovholt F. Schroeder R. DeYoung H. Denton	INITIALS DATE	REMARKS
FROM (Name and unit) P. A. Morris D/DRL		REMARKS
PHONE 7501	DATE 5/12/71	

USE OTHER SIDE FOR ADDITIONAL REMARKS

GPO : 1968 O—294-819

Step 4. The probability that both a communications error and a navigation overflight error will occur on the same flight will then be computed by combining the probabilities of Step 2 and Step 3.

Step 5. Data on all crashes on similar low level missions will be examined and the probability of a crash on any low level bomb run will be computed.

Step 6. Next the probability that a crash will occur in any mile of a low level bomb run will be computed.

Step 7. The probability that any individual bomb run will end in a crash in the circle of concern will next be computed.

Step 8. Finally, the risk of a crash in the circle sometime during the next year's operation will be computed using an estimated number of bomb runs of 2200 at the Bayshore RBS.

3. The analysis follows:

Step 1. Based on 1654 scored bomb runs at Bayshore during the period 1 January 1970 to 31 December 1970, the circular errors scored by radar indicate that the average off-track distance, that is the distance from the desired bomb track to the actual aircraft track, was far less than one-half mile. (The precise figure, while it was used in the analysis, is classified because it indicates SAC's bombing accuracy.) There were no bombing errors outside of the buffer zone, set at nine miles on the right of the track and four miles to the left during 1970. Only three bomb scores showed a circular error greater than five miles, none were beyond six-and-one-half miles. Although actual off-track distances for these gross error bomb scores were not recorded, since both range and deflection errors are normally assumed equal, we can estimate that no off-track distances were greater than four-and-one-half miles.

Bombers are directed back toward the desired track and are given an "abort" score whenever they approach the corridor limits. There were 13 such aborts during 1970 at Bayshore.

b. Based on historical communication outages and navigational experience, the chance of an overflight is conservatively estimated to be about 1.18×10^{-6} or about one chance in one million.

c. For any given Bayshore low level bomb run the chance of crash in the one-and-one-half mile circle surrounding the power plant is much less than one in ten trillion ($.668 \times 10^{-13}$).

d. The risk for an entire year's operation should be no more than about one-and-one-half in ten billion (1.47×10^{-10}).

4. Although the data base from which these calculations are made is not large, there is sufficient confidence in their accuracy to observe that even with the "temporary route" the chance for damage to the nuclear plant from SAC low level training flights is extremely low.

Richard J Camp

RICHARD J. CAMP
Operations Analyst

5/19/71

DEPARTMENT OF THE AIR FORCE
OFFICE OF THE CHIEF OF STAFF
UNITED STATES AIR FORCE
WASHINGTON, D.C. 20330

Mr. James H. Campbell, President
Consumers Power Company
212 W. Michigan Avenue
Jackson, Michigan 49201

Dear Mr. Campbell

Reference is made to your letter of 12 April 1971. We were grateful for the opportunity to discuss with Consumers Power representatives the Air Force proposals concerning low altitude training routes in the Bayshore area. We feel that the 6 April 1971 conference resulted in a much better understanding of the Bayshore situation; we hope that it increased your appreciation of the complex operations involved as well as the urgent requirement to reopen a training route in that area.

In response to your request for an analysis of the risks which would be involved in reopening the route based on the proposed new bomb run corridor centerline, located approximately 5.5 nautical miles east of the Big Rock Point Power Plant, HQ USAF has performed an analysis of several factors. The analysis is based on Strategic Air Command experience in low altitude training operations on all low level routes during the years 1963-1970, including the 7 January 1971 B-52 crash in Lake Michigan.

The following key facts emerged from this analysis (based on the proposed interim corridor, a 4.0 nautical mile buffer zone either side of centerline, and the number of Bayshore low altitude bomb runs - about 2200 - anticipated during a one-year period):

a. The probability that a B-52 will stray from the bomb run corridor and overfly any part of an area enclosed by a 1.5 nautical mile radius circle centered on the Big Rock Point Plant is calculated as 1.2×10^{-6}, or about one in a million.

b. The probability that, during an operational year, any B-52 will deviate from the corridor, overfly a part of the three nautical mile diameter circle centered on the plant, and crash within that circle is less than 1.5 in ten

billion. The probability that such a crash within the circle would result in damage to the plant or injury to the employees is, of course, much smaller.

The analysis indicates that the risks to the Big Rock Point Power Plant, based on resumption of training on the interim route, are extremely small.

As I am sure you appreciate, it is imperative that we provide low altitude training for our crews in order to insure that they are highly qualified at all times to accomplish their wartime mission. The availability of a low altitude training route in the Great Lakes area is vital to this preparedness program; the use of Bayshore, for reasons briefed in detail at the 6 April conference, is the most practical method of meeting this urgent requirement. Until we can move the Bayshore scoring facility to a new location, the interim route - which misses your plant by 5.5 miles - is the only one in this area available to us. In view of our urgent training requirement and the extremely small risk to your power plant, we plan to initiate training flights on this alternate route in the near future. We trust our analysis will reassure you of the minimal risk to your property and personnel and provide you a basis for reaching an agreement with your insurers.

Sincerely

Col. Campbell

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Risk Analysis (AF/OA Memo,
26 April 1971)

call MacVean

UNITED STATES
ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE
REGION II - SUITE 818
230 PEACHTREE STREET, NORTHWEST
ATLANTA, GEORGIA 30303

MAY 13 1971

J. P. O'Reilly, Chief
Reactor Testing and Operations Branch
Division of Compliance, HQ

NQUIRY REPORT NO. 71-8 - CAROLINA POWER AND LIGHT COMPANY
(H. B. ROBINSON NO. 2), LICENSE NO. DPR-23, DOCKET NO. 50-261 -
AIRCRAFT OVERFLIGHTS

As a follow up to a Headquarters inquiry regarding aircraft overflights, the following additional information was obtained from the subject licensee on May 12, 1971.

Mr. G. Beatty, Plant Manager, H. B. Robinson No. 2, contacted Colonel Parrack of Base Operations at Shaw Air Force Base, located about 35 miles southeast of the plant, (Phone: Area Code 803-668-8110, ext. 3110) to ask:

1. If the Air Force used the Robinson 2 containment as a mock target for bombing practice or as a radar reference point;

2. If so, what type of aircraft were used and the horizontal distance of the line of flight from the reactor containment.

Colonel Parrack did not answer Mr. Beatty's questions specifically, but he did read him parts of an Air Force directive which prohibited future flights over nuclear reactors except by "special arrangement". The directive required a reorganization of flight patterns by June 8, 1971. Colonel Parrack told Beatty that he would be glad to talk directly to the AEC concerning this matter. He also said that the Air Force had a representative working with the Federal Aviation Agency in Atlanta who could furnish information concerning Air Force flights. (The Atlanta Air Force representative was not contacted.)

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Mr. Beatty said that he has seen what appears to be Air Force A-4 type aircraft flying over the reactor containment at an estimated altitude of 1,000 to 2,000 feet as frequently as once a day. He has not complained to the Air Force about the overflights.

W. C. Seidle
Senior Reactor Inspector

CO:II:DCK

cc: E. G. Case, DRS (3)
P. A. Morris, DRL
R. S. Boyd, DRL (2)
R. C. DeYoung, DRL (2)
D. J. Skovholt, DRL (3)
P. W. Howe, DRL (2)
A. Giambusso, CO
L. Kornblith, Jr., CO
R. H. Engelken, CO
R. W. Kirkman, CO:I
B. H. Grier, CO:III
J. W. Flora, CO:IV
R. W. Smith, CO:V
REG Files