72-22

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FAX COVER PAGE

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TEXT:

Mark,

This is the cover page and the referenced page from the document cited at footnote 18 of the addendum to the PFS aircraft crash hazard report. We got the document from the NRC Public Document Room, so you should be able to find the entire document there. If you have any questions, please call me or Jerry Cooper.

Sean Barnett

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NUREG/CR-5042
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Evaluation of External Hazards to Nuclear Power Plants in the United States

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Prepared for
U.S. Nuclear Regulatory Commission

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accident rate (aircraft operating under 14 CFR 121, 125 and 127) of 7.7×10^{-9} is obtained. Multiplying the aircraft miles within 2.5 miles of the Three Mile Island site with the commercial aircraft accident rate gives:

$$30{,}000 \text{ ac miles} \times 7.7 \times 10^{-9} \frac{\text{ac accidents}}{\text{ac miles year}} = 2.3 \times 10^{-4} \frac{\text{accidents}}{\text{year}}$$

Assuming half of the commercial aircraft flights departing the Harrisburg International Airport have an operating weight of 200,000 pounds or greater, then the frequency of a commercial aircraft weighing 200,000 pounds or more having an accident within 2.5 miles of the Three Mile Island site is:

$$1/2 \times (2.3 \times 10^{-4} \frac{\text{accidents}}{\text{year}}) = 1.2 \times 10^{-4} \frac{\text{accidents}}{\text{year}}$$

6.4.4 Power Plant Response to Aviation Accidents

Since the NRC regulations regarding aviation hazards to nuclear power plants are only partly probabilistic in nature and do not relate to core damage or large release frequency, to obtain a probabilistic estimate of the frequency of core damage due to aviation accidents, one must turn to probabilistic risk analysis. Unfortunately, the few PRAs that have considered aviation accidents (Indian Point, Millstone 3, Seabrook, Zion [Ref. 6.4.9 to 6.4.12]) have dismissed aviation accidents on the basis of the aviation accident frequency.

The only probabilistic analysis of a power plant's response to an aircraft crash is a 1971 paper by Chelapati, Kennedy and Wall [Ref. 6.4.8] which modeled aircraft engines as projectiles impacting the plant walls. The aircrafts were divided into two categories, small aircraft and large aircraft.

For small aircraft (less than or equal to 12,500 pounds in weight), the aircraft engines were idealized as projectiles ranging in weight from 230 to 800 pounds with the relative distribution of aircraft engine weight determined from aircraft census. Within five miles of an airport, small aircraft engines were modeled with an impact velocity ranging from 67 to 105 miles per hour. Beyond five miles from an airport, small aircraft engines were modeled with an impact velocity ranging from 67 to 280 miles per hour.

For large aircraft (greater than 12,500 pounds in weight), the aircraft engines were idealized as projectiles ranging in weight from 450 to 4200 pounds with the relative distribution of aircraft engine weight determined from aircraft census. Within five miles of an airport, large aircraft engines were modeled with an impact velocity ranging from 95 to 185 miles per hour. Beyond five miles from an airport, large aircraft engines were modeled with an impact velocity ranging from 175 to 610 miles per hour.