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NIRS

**Nuclear Information and Resource Service**

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February 4, 1994

John W.N. Hickey
Chief, Enrichment Branch
Division of Fuel Cycle Safety & Safeguards
Office of Nuclear Material Safety & Safeguards
Mail Stop 4 E-4
U.S Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Hickey:

Enclosed is the chart and explanation referred to on page 28 of NIRS' comments on NUREG-1484, submitted January 25, 1994. I apologize for not including it in the original document. Thank you for calling the omission to my attention.

Best wishes,

Michael Mariotte
Executive Director

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## Explanation of Table "LESDOSE.XLS"

**Column 1** represents the maximum annual dose to an individual (an infant located at Bluegill Pond) as described in NUREG-1484, page 4-44.

**Column 2** represents the total annual radioactive burden this individual would receive, according to a 0.6 millirem annual dose rate. The primary radioisotope causing exposures from the proposed LES plant is Uranium-235, which has a half-life of about 700 million years. Thus, virtually none of the radioactivity from the Uranium would decay over the 30-year life of the plant. Because Uranium-235 is a "heavy" element, it would not be expected to disperse widely in the air or water. Rather, it would tend to concentrate within Claiborne Parish, and particularly in the area from the release point to BlueGill Pond and on to Lake Claiborne. It is thus rational to assume that the burden of the first year's release (0.6 mrem) would still be existent at the end of the 30-year plant life, as would the burden of all subsequent years' releases. Column 2, then, shows the steadily increasing annual radioactive burden that would be caused by the this plant to the most-exposed individual, and concludes that by year 30, this individual would receive 18 mrem/year in addition to background radiation. Once the plant were closed, that burden would not be expected to increase, and over a period of time (in this case, a very *long* period of time), this level would decrease.

**Column 3** represents the cumulative dose the most-exposed person would receive by a given year after the onset of plant operations. This column reflects the 0.6 mrem/year dose released in the current year, plus the additional background levels described in Column 2. By year 30, the most-exposed individual would have received a cumulative dose of 277 millirems above background levels. This is an average of 9.27 mrem/year, well above the 0.6 mrem/year release rate. Because of the long hazardous life of Uranium-235, the 0.6 mrem exposure figure is only meaningful during first-year operations. After year 30, cumulative doses would expect to increase by 18 mrem/year for the long-term future, although very far into the future, absent new exposure sources, that figure would decrease.

| | Annual dose | Total Annual Burden | | Cumulative dose |
|---|---|---|---|---|
| | | | | |
| year 1 | 0.6 | 0.6 | | 0.6 |
| year 2 | 0.6 | 1.2 | | 1.8 |
| year 3 | 0.6 | 1.8 | | 3.6 |
| year 4 | 0.6 | 2.4 | | 6 |
| year 5 | 0.6 | 3 | | 9 |
| year 6 | 0.6 | 3.6 | | 12.6 |
| year 7 | 0.6 | 4.2 | | 16.8 |
| year 8 | 0.6 | 4.8 | | 21.6 |
| year 9 | 0.6 | 5.4 | | 27 |
| year 10 | 0.6 | 6 | | 33 |
| year 11 | 0.6 | 6.6 | | 39.6 |
| year 12 | 0.6 | 7.2 | | 46.8 |
| year 13 | 0.6 | 7.8 | | 54.6 |
| year 14 | 0.6 | 8.4 | | 63 |
| year 15 | 0.6 | 9 | | 70 |
| year 16 | 0.6 | 9.6 | | 79.6 |
| year 17 | 0.6 | 10.2 | | 89.8 |
| year 18 | 0.6 | 10.8 | | 100.6 |
| year 19 | 0.6 | 11.4 | | 112 |
| year 20 | 0.6 | 12 | | 124 |
| year 21 | 0.6 | 12.6 | | 136.6 |
| year 22 | 0.6 | 13.2 | | 149.8 |
| year 23 | 0.6 | 13.8 | | 163.6 |
| year 24 | 0.6 | 14.4 | | 178 |
| year 25 | 0.6 | 15 | | 193 |
| year 26 | 0.6 | 15.6 | | 208.6 |
| year 27 | 0.6 | 16.2 | | 224.8 |
| year 28 | 0.6 | 16.8 | | 241.6 |
| year 29 | 0.6 | 17.4 | | 259 |
| year 30 | 0.6 | 18 | | 277 |