ENVIRONMENTAL IMPACT APPRAISAL
IN THE MATTER OF
THE H. B. ROBINSON, UNIT NO. 2,
DISPOSAL OF LICENSED MATERIALS

1.0 INTRODUCTION

In accordance with 10 CFR 20.302, Carolina Power and Light Company (the licensee) requested approval of a proposed procedure to dispose of radioactivity contaminated sediment (licensed material) from two settling ponds located within the H. B. Robinson, Unit No. 2, restricted area to a fossil plant (H. B. Robinson, Unit No. 1) ash pond located in an owner-controlled area (unrestricted area). The proposed procedure is described in the licensee's safety analysis report entitled "Request for Approval of Transfer of Contaminated Sediment to the H. B. Robinson Ash Pond" submitted by the licensee with their transmittal letter dated January 17, 1983.

In July 1980, the licensee transferred 3,000 cubic meters (20 millicuries of Co-60) of sediment from the East Settling Pond to the Ash Pond. This request involves an additional transfer of 6,000 cubic meters (75 millicuries of Co-60) of sediment from East and West Settling Ponds to the same ash pond. In addition, the licensee requests blanket approval for such future transfers whenever the concentration of Co-60 does not exceed an average concentration of 3×10^{-5} μCi per gram wet. These two settling ponds are used to remove particulates by retention and settlement (coal ash and suspended matter) from Unit No. 1 (coal-fired), and Unit No. 2 (nuclear) storm drain discharges, to meet National Pollutant Discharge

1.0 Elimination System permit limits. The accumulated sediment is contaminated by trace amount of radioactivity (mainly Co-60) from the Turbine Building floor drain discharges which enter the Unit No. 2 storm drain.

2.0 EVALUATION

2.1 ENVIRONMENTAL & EFFLUENT

The radiological impacts on man and biotas due to radioactive material in liquid and gaseous effluents and direct radiation from the H. B. Robinson, Unit No. 2, were evaluated in the Final Environmental Statement (FES) dated April 1975. The radwaste treatment and effluent control systems installed at H. B. Robinson, Unit No. 2, were evaluated in the Safety Evaluation Report dated May 1970. Since the FES was issued, the licensee has not modified these systems. Expected amounts of radioactive material in liquid effluent into Lake Robinson and in gaseous effluent to the atmosphere were given in Tables 3.5 and 3.6 of the FES, respectively.

We have reviewed the actual operating experience accumulated at H. B. Robinson, Unit No. 2, and find that the combined releases of mixed fission and activation products released in liquid effluent into Lake Robinson from 1972 to 1981 averaged 0.8 Ci per year, which represents less than 3% of the estimated value given in the FES. The licensee states that waste water in the ash pond can readily seep into the ground and this seepage would migrate toward Lake Robinson where any radioactive material would be diluted.

In Section 5.4 of the FES, we estimated that the gross radioactivity concentrations, exclusive of tritium, will be 2.5×10^{-9} μCi/ml per curie of radioactivity discharged in the immediate vicinity of the plant discharge in Lake Robinson. In our evaluation, we have assumed that all radioactivity in contaminated sediments already transferred and to be transferred to the ash pond (108 millicuries total inclusive of 95 millicuries of Co-60) are instantaneously leached and/or released to Lake Robinson without radioactivity decay or removal by ion exchange process in soil. With these conservative assumptions, the resulting radioactivity concentration in the immediate vicinity of the plant discharge will not exceed 2.7×10^{-10} μCi/ml. In addition, there are no drinking water supplies within 50 miles of the plant that could be affected by the liquid effluents or seepage from the ash pond.

The licensee further states that the contaminated sediment transferred will normally be submerged under several feet of water and will be covered by uncontaminated sediment and it is very unlikely that the contaminated sediment could dry out after transfer to the ash pond and become airborne. Even if the contaminated sediment becomes airborne, the resulting airborne concentrations of each nuclide will be a fraction (less than 1×10^{-5} percent) of maximum permissible concentrations specified in 10 CFR 20, Table II, Column 2.

2.2 RADIATION EXPOSURE

CPL has estimated conservatively the radiological impacts on the public, and on plant workers, that could result from the proposed transfer of contaminated sediment at Robinson-2.

The principal source of radiation doses to individual members of the general public is exposure to direct radiation from radionuclides present in sediment. Cobalt-60 is the most important nuclide in terms of dose.

CPL proposes to apply a limit of 3.0×10^{-5} microcuries per gram of cobalt-60 in wet sediment to be transferred. The limiting dose to the most highly exposed individual in the general public, a teenager spending an assumed sixty-seven hours per year on the shoreline of the ash pond, would not exceed 5 millirems per year.

Exposures of this magnitude would be very unlikely. The area in question is onsite; it is not attractive for recreational purposes, and is rarely occupied. Over a period of years, very few individuals have been seen in this area, and have not remained for more than a few hours.

CPL has estimated doses to members of the public from other modes of radiation exposure. Inhalation of airborne concentrations of radionuclides, as well as ingestion of water, vegetation, and deer meat were considered. Even taking into account the licensee's very conservative assumptions, e.g., that deer derive their entire food and water intake from the Ash Pond, and that the maximum individuals in each age group derive their entire meat intake from these deer, likely doses from these other exposure modes would be substantially less than the doses due to direct radiation from the sediment.

The projected maximum dose of 5 millirems to any individual as a result of this transfer may by compared to the average background radiation level of about 100 millimrems per year in South Carolina. Any individual who incurs a dose of 5 millirems is assumed to have incurred a cancer mortality risk of about 1 chance in 1.5 million, and a risk of genetic disorders of about 1 chance in 0.8 million.

With regard to occupational radiation exposure, on the basis of prior experience, each sediment transfer can be assumed to involve two individuals, each working a total of 160 hours. Each would receive a total of about 8 millirems, for a total of about 16 person-millirems.

The projected occupational dose of 7.7 millirems these individuals incur may be compared to the NRC quarterly dose limit of 3000 millirems. The total radiological impact of the transfer on these individuals would be very small, relative to normal radiation risks on the job, and relative to the risks normally associated with other occupational activities.

Based on our review and evaluation of the proposed mode of transferring contaminated sediment at Robinson-2, we conclude that:

(1) the radiation risks to the workers involved in the sediment transfer are very small compared to routine occupational exposures at H. B. Robinson Steam Electric Plant Unit No. 2.

(2) the possible radiation risks to members of the general public as a result of such sediment transfers are well below regulatory limits, and very small in comparison to doses members of the public receive each year from exposure to natural background radiation.

(3) There will be no change in the conclusions or evaluation given in the H. B. Robinson, Unit No. 2, FES in regard to the radiological impacts on man and biota due to the proposed transfer of contaminated sediment from the settling ponds to the ash pond and that there will be no significant environmental impact attributable to the proposed procedure. In addition, the ash pond is located within owner-controlled areas (the licensee's property boundary). Therefore, we find that the licensee's proposed procedure is acceptable. However, the licensee's request on blanket approval for such future transfer of radioactive material whenever the concentration of Co-60 does not exceed an average concentration of 3×10^{-5} μCi/gm wet is not acceptable until we receive from the licensee the results of recently initiated environmental radiation monitoring program of H. B. Robinson Ash Pond (pond surface water, ash, soil, and aquatic vegetation samples) and we complete our analysis and evaluation of the monitoring results.

3.0 Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the approval does not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of an accident of a type different from any evaluated previously, and does not involve a significant reduction in a margin of safety, the approval does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with

the Commission's regulations and the issuance of this approval will not be inimical to the common defense and security or to the health and safety of the public.

Dated: February 18, 1983

Principle Reviewers: J. Nehemias
J. Lee