NUCLEAR PLANT INSPECTION

The photos of the nighttime New York City skyline, with millions of lights consuming electric power, symbolize the massive job of the Power Authority of the State of New York, the largest non-federal public power organization in the United States. The Power Authority represents an unusual blending of public and private enterprise. It exists to carry out the orders of the legislature and the governor relating to energy matters, but its projects are financed by the private sector through investment in the Power Authority's bonds. To meet the state's energy needs, the Power Authority operates a complex of hydroelectric, oil-fired and nuclear facilities, plus a transmission line network that connects with municipal and private utilities throughout New York, in Vermont and in the Canadian provinces of Ontario and Quebec.

At right below is one of the Power Authority's two nuclear facilities, the James A. Fitzpatrick Nuclear Power Plant on Lake Ontario near Oswego, New York; the Power Authority also operates Indian Point 3 Nuclear Power Plant in northern Westchester County. Since they started operating in 1975 and 1976 respectively the two facilities have produced more than 50 billion kilowatt hours of electricity.

At each of the nuclear plants, a yearly inspection is performed to insure safety. For one stage of the inspection, engineers use a computer program—Crack Growth Analysis Program—supplied by NASA's Computer Software Management and Information Center (COSMIC). A check is first made to determine whether any cracks have developed in the welds of

the nuclear steam supply system. Radiographs, dye penetration inspections and visual inspections are performed to obtain information as to the size and location of any cracks in the metal structure and welds. This information is used in the crack growth analysis, which determines whether a particular crack will get larger and, if so, its expected rate of growth. Necessary repairs can then be planned and carried out before serious problems develop.

The Power Authority reports that the COSMIC software package was selected because it includes three separate crack growth analysis models. Each model can provide an acceptable analysis; in combination they offer significantly greater assurance of accuracy.