

APR 27 1984

MEMORANDUM FOR: Edward L. Jordan  
Director, Division of Emergency Preparedness  
and Engineering Response  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission

FROM: *John A. Bullock* Richard W. Krimp  
Assistant Associate Director  
Office of Natural and Technological Hazards Programs

SUBJECT: Status Report on Offsite Radiological Emergency Planning for  
the Braidwood Nuclear Power Station

Attached is a status report on offsite radiological emergency planning for the Braidwood Nuclear Power Station. The report, titled "Interim Finding" and dated April 11, 1984, was prepared by Region V of the Federal Emergency Management Agency (FEMA).

Since neither an exercise, nor offsite radiological emergency plan have been accomplished in accordance with FEMA Rule 44 CFR 350, the report focuses on the facility and surroundings, emergency planning zones, demographic considerations, emergency planning authority and organization, and a history and status of planning and preparedness.

As the report points out, the Illinois Emergency Services and Disaster Agency does not expect to publish a preliminary draft plan until July 15, 1984. A review document is projected for publication in October, 1984.

The report further states that the Commonwealth Edison Company, Nuclear Regulatory Commission Region III, FEMA Region V, and the Illinois Emergency Services and Disaster Agency have agreed on August 6, 1985, as the date for the qualifying full participation exercise.

If you have any questions, please contact Mr. Robert S. Wilkerson, Chief, Technological Hazards Division, at 287-0200.

Attachment  
As Stated

CC:  
Wallace Weaver, FEMA Region V, Chicago  
Gordon Wenger, FEMA Region V, Battle Creek

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INTERIM FINDING

Braidwood Nuclear Power Station  
Offsite  
Radiological Emergency Preparedness

State of Illinois  
Grundy, Livingston, Kankakee,  
and Will Counties

I. INTRODUCTION

A. Area Description

1. Facility and Surroundings

The Braidwood Nuclear Power Station is located approximately four miles south of the city of Braidwood in the southwest corner of Will County and less than one mile east of Interstate Illinois 55. Commonwealth Edison Company, Chicago (applicant), is the owner-operator who also operates the Dresden, La Salle, Quad Cities, and Zion Nuclear Power Stations and is constructing the Byron Nuclear Power Station in northern Illinois. Twenty miles to the north-northeast is Joliet, population 76,000. Thirty-five miles to the northeast is the south city limits of Chicago, population in excess of 3 million. Twenty miles to the south-southeast is Kankakee, population 31,000. The Braidwood Station is in close proximity to the Dresden and La Salle Nuclear Power Stations, both are between 10 and 20 miles to the northwest. The three stations share portions of the same Emergency Planning Zones (EPZ).

Will County, the County in which the Braidwood Station is located, is bordered on the south by Kankakee County, on the west by Grundy and Kendall Counties, and to the north by Cook and DuPage Counties. Grundy, Kankakee, and Livingston Counties, in addition to Will County, are the only Counties in which the 10 mile Emergency Planning Zone falls.

Braidwood Station is a sister station to Byron. Both are of the same basic design. The Braidwood Station consists of two identical pressurized water reactors (PWR), nuclear steam supply systems (NSSS) and turbine generators furnished by Westinghouse Electric Corporation. Each reactor generator system is designed for a power output of 1,120 net mega watts electrical. Cooling for the station is provided by a lake that covers approximately 2,640 acres.

The Braidwood Station has two Auxiliary Building ventilation stacks which are the release points for gaseous radioactive effluents. The top of each stack rises 200 feet above the grade elevation.

## 2. Emergency Planning Zones

The Emergency Planning Zone (EPZ) for the Braidwood Station consists of a circle with the Braidwood Station as the center point. The EPZ extends ten miles outward in all directions from the station for the plume exposure pathway planning zone and fifty miles outward for the ingestion exposure pathway planning zone. In the event of a serious accident at the Braidwood Station, the plume exposure EPZ will be the area in which intensive efforts will be made to notify and protect residents and transient population from radiation exposure.

### a. Governments within the 10 Mile Emergency Planning Zone

The 10 mile Emergency Planning Zone (EPZ) includes the southwestern portion of Will County, the east central portion of Grundy County, a northwest corner of Kankakee County and less than the equivalent of four square miles of the northern edge of Livingston County. Within the 10 mile EPZ are several small municipal governments and villages: Braidwood (population 3,200), Diamond (population 900), Essex (population 360), East Brooklyn (population approximately 300), Wilmington (population 4,400), South Wilmington (population 720), Gardner (population 1,200), Central City (population 1,400), Coal City (population 3,040), Carbon Hill (population 317), Eileen (population 371), Ritchie (population approximately 300), Custer Park (population approximately 400), and Braceville (population 670).

#### (1) The Low Population Zone (LPZ)

The Low Population Zone (LPZ) 3 mile radius encompasses some significant land uses. Strip mining for coal over the last several decades has left the entire southeastern quarter and a portion of the northeast quarter of the LPZ a vast scar on the earth's surface. The surface of the region is underlaid with limestone formations and seams of coal. When the surface is excavated, the sublevel fills with water. The deserted mining areas become a haven for sports enthusiasts. The strip mine lakes abound with fish and waterfowl.

### b. Governments within the 50 Mile Emergency Planning Zone

The 50 mile EPZ includes the Illinois Counties of Cook, DeKalb, DuPage, Ford, Grundy, Iroquois, Kane, Kankakee, Kendall, La Salle, Livingston, McLean, Will and Woodford. The Indiana Counties are Lake and Newton.

### 3. Special Demographic Circumstances for Planning

The area topography consists of level prairie. Strip mining has created ridges and knolls of overburden material. The created depressions are filled with sub-surface water from the high water table and surface runoff. The natural drainage forms small creeks which meander across the land. The small creeks form into rivers. Some creek and river beds are several feet below the surrounding prairie. This region of the Midwest is part of the vast expanse of prairie which runs into Indiana and west into Iowa and Nebraska.

The area is a productive agricultural community. Cultivated agricultural crops are primarily soybeans and corn. Pork and beef production constitutes the principal animal husbandry practice. The "family-farm" is the backbone of commerce in this area. Farm size range from a few hundred acres to several hundred acres.

In the small villages near the station are dry goods and food stores, petroleum depots, seed and fertilizer and agricultural equipment sales, banks, small family-owned businesses, and most generally a grain elevator. The goods, services and exchange of news focuses in these small centers of commerce.

Industries in the LPZ include: Bowers Sieman Chemicals Company, Coal City (industrial lubricants and chemicals for the wire industry) employs 30 people; DeMert and Dougherty Inc., Coal City (aerosols, etc.) employs 115 people; Brownie Special Products Co., Gardner (bakes pizza crusts and cookies) employs 25 people; Personal Products Co., Wilmington Division of Johnson and Johnson (hygienic products) employs 350 people; Production Training Center, Braidwood (Commonwealth Edison Company) averages 150 trainees.

#### a. Unique Considerations

##### (1) Recreational Area

Within and just outside the 10 mile EPZ are several recreational sites. The numerous lakes of the strip mining areas provide for fishing, boating, water skiing, hiking, water fowl hunting, and picnicing. The Kankakee River flows from the southeast to the north across the northeast quarter of the 10 mile EPZ. Waterfront homes, both summer and winter, and fishing camps line both sides of the river.

Goose Lake Prairie State Park predominates the northwest quarters of the 10 mile EPZ and the Des Plaines

Wild Life Conservation Area occupies the northern portion of the 10 mile EPZ limit. Both offer nature study, hunting, fishing, recreational boating and other outdoor activities.

All of the recreational sites attract thousands of residents of the area as well as thousands of transients.

(2) Unique Facilities

To the northeast of the station, between the 5 and 10 mile area of the EPZ, is the Joliet Arsenal which covers many thousands of acres. Also, a large grain storage facility is in the northeast quarter of the EPZ.

(3) Transportation Systems

Interstate Illinois 55 enters the 10 mile EPZ at the north, passes the Braidwood Station to the west about one mile and continues out of the 10 mile EPZ to the southwest. State Route 17 enters the southern edge of the 10 mile circle. State Route 47 enters the western edge of the 10 mile EPZ. State Routes 113, 102, 129, and 53 are major State highways which predominate the northeastern portion of the 10 mile EPZ.

River barge traffic moves along the Kankakee River up stream as far as Wilmington. The River Pool is separated by a spillway and locke at Wilmington. The river flows from the east of the 10 mile EPZ to the north.

Three primary railroads cross the 10 mile EPZ. The Illinois Central Gulf passes within 1/2 mile of the station and runs northeast to southwest. The Atchison Topeka and Santa Fe crosses the northwest quarter from northeast to southwest. The Norfolk and Western crosses the east and southeastern quarter from the northeast to the southwest. Several spurs of the main railroads exist in the 10 mile EPZ. Several interstate pipelines transverse the 10 mile EPZ, primarily in a southwest to northeast direction. They are mainly concentrated in the southeastern quarter of the EPZ.

(4) Local Emergency Resources

Within the areas' demographics are six villages which dominate the 10 mile EPZ; Braidwood, Braceville, Gardner, South Wilmington, Coal City and Wilmington. Their combined populations total 13,230. Many emergency response organizations are volunteer and/or part-time as are many of the elected officials' positions.

Emergency equipment is sufficient to meet the every day emergency needs of the communities but is considered limited to meet a technological emergency such as a significant radiological accident at a nuclear power station.

## B. Emergency Planning Authority and Organization

### 1. Principal State and Local Planning Organizations

The Illinois Emergency Services and Disaster Agency Act of 1975 (Ill. Rev. Stat. Ch. 27, para. 1101 et. seq.) establishes an Emergency Services and Disaster Agency and confers upon it broad authority to plan for a coordinated response by State and local agencies to all disasters, whether from natural or man-made causes. The Act provides that the authority to deploy resources in response to an emergency shall be provided by an executive proclamation of a "State of Disaster Emergency."

The Illinois Nuclear Safety Preparedness Act (Ill. Rev. Stat., Ch. 111 1/2, para. 4301 et. seq.) designates the responsibility for emergency response planning for accidents at fixed nuclear facilities to the Illinois Department of Public Health, and provides for a fee to be assessed on licensed nuclear power reactors to fund the Illinois Nuclear Safety Preparedness Program.

The Governor of Illinois, by Executive Order Number 3, dated April 1, 1980, created the Department of Nuclear Safety, transferring to that department responsibilities of the Illinois Department of Public Health in the Illinois Nuclear Safety Preparedness Program.

## C. History and Status of Planning and Preparedness

### 1. Plan Development

The Illinois Plan for Radiological Accidents (IPRA) is contained in Volume I, the "State General Plan," March 1982, and an accompanying book of Standing Operating Procedures. Volume VII Braidwood has not been developed.

### 2. Status of Braidwood Site-Specific Plans

The Illinois Emergency Services and Disaster Agency on March 15, 1984, established the Braidwood field planning office at Mazon, Illinois. The field office was staffed with three planners and one supervisor. On April 1, 1984, additional planners were added to the staff bringing the planning staff to twelve.

The State Emergency Services and Disaster Agency is projecting a preliminary Draft Plan "Rev. 0" to be published July 15, 1984.

The preliminary plan would be the framework in which the refined details would be placed after local coordination. The next step is to publish the review document which is expected to be published in October 1984.

Throughout the formal plan development process the Illinois Emergency Services and Disaster Agency and the Department of Nuclear Safety will be developing intensive training sessions to be given to local government officials and emergency responders. The peak of the training will precede the exercise by two weeks.

The local governments near the station have exhibited enthusiasm in developing radiological emergency preparedness capability. Because some of the Braidwood 10 mile EPZ includes the 10 mile EPZ of Dresden and La Salle Nuclear Power Stations, much of the radiological emergency readiness has been developed and is in place. That in itself should lessen some of the basic research which precedes the development of plans.

It is known that Grundy County is sensitive to the regulatory requirements it must meet for supporting the emergency response to an accident at a nuclear power station. Grundy County and the State of Illinois are pursuing special consideration for exercise participation in the Dresden and La Salle exercises.

Discussions between Illinois Emergency Services and Disaster Agency and the Federal Emergency Management Agency Region V, bring into perspective the reluctance of Grundy County to participate in all of the required exercises for Dresden, La Salle and Braidwood Nuclear Power Stations. A special provision may have to be considered for Grundy County when the Braidwood Station comes on line.

The applicant (Commonwealth Edison Company), NRC Region III, FEMA Region V and the Illinois Emergency Services and Disaster Agency have agreed on August 6, 1985 for the qualifying full participation exercise. It is expected that, prior to the exercise, the plan will have been developed, reviewed by the Region V Regional Assistance Committee and commented upon, and the modifications entered into the plan. If the plan review reveals any serious impediments or lacks completeness, FEMA Region V will advise the State and recommend a change in implementing the plans.