

APPLICATION  
TO RECEIVE, POSSESS, STORE, AND USE  
SMALL QUANTITIES OF  
SPECIAL NUCLEAR MATERIAL CONTAINED IN  
(a) IN-CORE NEUTRON DETECTORS  
AND  
(b) ALPHA CALIBRATION STANDARDS & CHECK SOURCES  
FOR  
CLINTON POWER STATION, UNIT 1

July, 1981

ILLINOIS POWER COMPANY  
SOYLAND POWER COOPERATIVE, INC.  
WESTERN ILLINOIS POWER COOPERATIVE, INC.

## APPLICANTS

The names and addresses of the applicants are given below:

ILLINOIS POWER COMPANY  
500 S. 27th Street  
Decatur, Illinois 62525

SOYLAND POWER COOPERATIVE, INC.  
P. O. Box A1606  
Decatur, Illinois 62525

WESTERN ILLINOIS POWER COOPERATIVE, INC.  
P. O. Box 609, Hwy. 675  
Jacksonville, Illinois 62651

Each of the above applicants is incorporated in the State of Illinois.

The names, addresses, and citizenship of the principal officers for each of the applicant corporations are included with the application for an operating license, dated August 1980.

Information concerning the issue of possible control or ownership of the applicant corporations by any alien, foreign corporation, or foreign government is also included with the application for an operating license.

## TERM OF LICENSE

It is requested that the license begin September 1, 1981 and remain in effect until such time as it may be incorporated into the permanent operating license.

## 1.0 GENERAL INFORMATION

### 1.1 IDENTIFICATION OF PLANT AND MATERIAL TO BE LICENSED

#### 1.1.1 Identification of Reactor, Geographic Location, Docket and Construction Permit

This application is submitted for Unit 1 of Clinton Power Station. This unit is a BWK-6 boiling water reactor (218 inch vessel) designed and supplied by General Electric Company. The unit will have a rated core thermal power level of 2894 Mwt.

The station is located about 6 miles east of the City of Clinton in DeWitt County, Illinois. The coordinates of the station are approximately  $40^{\circ} 10' 19.5''$  latitude and  $88^{\circ} 50' 3.0''$  longitude.

The construction permit application for Clinton Unit 1 was docketed on October 30, 1973 on AEC Docket Number 50-461 and was issued Construction Permit Number CPPR-137 on February 24, 1976. The information set forth in the application for an operating license for the station, dated August 1980, is hereby incorporated into this application by reference.

#### 1.1.2 Type and amount of material

This license is requested for the small quantities of special nuclear material contained in (a) In-Core Neutron Detectors and (b) Alpha Calibration Standards & Check Sources. The amounts of Special Nuclear Material are tabulated below:

### 1.1.2.1 In-Core Neutron Detectors

Description of Detectors	Estimated Quantity	Nominal Grams U-235		Maximum Grams U-235	
		Per Detector	Total	Per Detector	Total
a) Source Range Monitors (SRM's)	10	0.00272	0.0272	0.003	0.030
b) Intermediate Range Monitors (IRM's)	17	0.00075	0.01275	0.001	0.017
c) Local Power Range Monitors -	280	0.000218	0.06104	0.001	0.280
d) Traversing In-core Probes (TIP's)	10	0.000744	0.00744	0.001	<u>0.010</u>
				Total	0.337

In order to accommodate various contingencies, it is requested that the license authorize possession of in-core detectors containing a maximum at any one time of 1.0 gram U-235 at any enrichment.

The in-core neutron detectors may be installed in the reactor core prior to receipt of the operating license. Other than storage, this is the only use of these items prior to receipt of the operating license.

### 1.1.2.2 Alpha Calibration Standards and Check Sources

Description of Standards and Sources	Estimated Quantity	Nominal Amounts of Pu-239			
		Per Detector		Total	
		MCi	Grams Pu-239	MCi	Grams Pu-239
a) Alpha Calibration Standard Manufactured by Eberline Instru- ment Corp., Model S94-1	2	2	0.00003254	4.00	0.00006508

Description of Standard and Sources	Estimated Quantity	Nominal Amounts of Pu-239			
		Per Detector Mci	Grams Pu-239	MCi	Total Grams Pu-239
b) Alpha Calibration Standard Manufactured by Eberline Instrument Corp., Model S94-4	2	0.5	0.000008135	1.00	0.00001627
c) Alpha Check Source Manufactured by Eberline Instrument Corp., Model CS-1	2	0.02	0.000000325	0.04	0.00000065
d) Alpha Check Source Manufactured by Eberline Instrument Corp., Model CS-3	2	0.01	0.000000163	0.02	0.000000325
Totals				5.06	0.0000823

In order to accommodate various contingencies, it is requested that the license authorize possession of a maximum at any one time of 15 Micro-Curies of Plutonium-239 in the various alpha calibration standards and check sources.

The alpha calibration standards and check sources will be used for calibration or instrument checks on portable or installed radiation monitoring equipment. Other than storage, this is the only use of these items.

## 1.2 STORAGE CONDITIONS

1.2.1 In-Core Neutron Detectors

Prior to installation, all detectors will be stored under lock and key in the Clinton permanent warehouse.

The Clinton warehouse is designed and operated so as to assure a level of security and control of quality items.

1.2.2 Alpha Calibration Standards & Check Sources

When not in use, alpha calibration standards and check sources will be stored in locked cabinets and drawers in controlled storage area(s) in the Rad/Chem laboratories, radiation protection office, radiation counting rooms, and/or the instrument calibration facility.

1.3 PHYSICAL PROTECTION

The quantity of U-235 (contained in uranium enriched to 20% or more in the U-235 isotope), or plutonium to be possessed under this license is less than the quantity specified in 10 CFR 73.1(b) of 10 CFR 73. Therefore, the physical protection requirements specified therein do not apply.

1.4 TRANSFER OF SPECIAL NUCLEAR MATERIALS

Because there are not more than 15 grams of fissile material subject to this license, this material is exempt from the packaging and transfer requirements of 10 CFR Part 71.

1.5 FINANCIAL PROTECTION AND INDEMNITY

Because this license does not involve Special Nuclear Material for use as fuel, the proof of financial protection

### 1.5 (continued)

required by 10 CFR 140.13 does not apply to this license.

## 2.0 HEALTH & SAFETY

### 2.1 RADIATION CONTROL

#### 2.1.1 Training and Experience

The technical qualifications for personnel with Radiation Protection responsibilities are described in Section 13.1.3 of the FSAR.

#### 2.1.2 Contamination Monitoring

Contamination control is discussed in Subsection 12.5.3.4 of the Clinton FSAR. In addition, various station procedures provide specific guidance for checking for contamination.

- a) Receipt of Radioactive and Fissile Material
- b) Contaminated Materials Guides and Control
- c) Radiation Survey Techniques
- d) Decontamination of Area/Equipment

Table 12.5-2 of the Clinton FSAR describes the equipment to be used in checking for contamination.

In addition, Clinton Power Station procedures require that the alpha calibration standards and check sources be leak tested upon receipt and at subsequent intervals every three months.

#### 2.1.3 Calibration and Testing of Instruments

The calibration and testing of radiation monitoring instruments is discussed in Subsection 12.5.3.2.8 of



### 2.1.3 (continued)

the Clinton FSAR. Station calibration procedures and frequencies will be based on information provided by the instrument vendor.

### 2.2 NUCLEAR CRITICALITY SAFETY

Because the amounts of fissile material are much less than required for criticality, this material is exempt from the criticality accident requirements of 10 CFR 70.24.

### 2.3 ACCIDENT ANALYSIS

As discussed in sections 1.2.1 and 1.2.2, utmost care will be exercised in the safe storage of the in-core neutron detectors and alpha calibration standards & check sources. The in-core detectors contain very small quantities of uranium and no plutonium. The uranium is only mildly radioactive, therefore any accident that could affect the safety of storage will have very minimal consequences. The alpha calibration standards and check sources contain extremely small quantities of plutonium. These items will be stored in locked cabinets and drawers in controlled storage areas. Therefore, any accident that could affect the safety of storage is expected to have minimal consequences.

### 3.0 OTHER MATERIALS REQUIRING NRC LICENSE

Requests for licensing of other materials requiring NRC license will be made via separate license applications.



#### 4.0 TECHNICAL QUALIFICATIONS

The technical qualifications of the Clinton station personnel are detailed in Chapter 13 of the Clinton FSAR.

In addition, a plant procedure outlining the Special Nuclear Material program requires that a SNM custodian be appointed by the station's Technical Supervisor. The SNM custodian is responsible for --

- a) maintaining records of SNM inventories, movements, and locations;
- b) isotopic content calculations for SNM;
- c) authorizing fuel transfer;
- d) preparing nuclear material transaction and status reports;
- e) and coordinating receipt and shipment of nuclear fuel.

The SNM custodian will have training and experience in reactor engineering and will have specific expertise in the areas of reactor, nuclear fuel, and nuclear instrumentation design. The technical qualifications of the SNM custodian will be maintained by the station's training department.