DUQUESNE LIGHT COMPANY
Power Stations Department

Conceptual Design of the

Beaver Valley Power Station

Technical Support Center

March 4, 1980

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I. Background and Summary

The Office of Nuclear Reactor Regulation of the U.S. Nuclear Regulatory Commission established the TMI-2 Lessons Learned Task Force shortly after the TMI-2 accident in the spring of 1979. The purpose of the Task Force is to identify and evaluate those safety concerns raised by the TMI-2 accident that require generic licensing actions. In July, 1979, the Task Force issued its first report, NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations." NUREG-0578 contains 23 specific recommendations in 12 areas which are to be implemented in two stages over the 18 month period following publication. One of the recommendations of NUREG-0578 is the establishment of an onsite Technical Support Center (Section 2.2.2(b)).

This report describes the results of preliminary planning for the Onsite Technical Support Center building, plant monitoring equipment and communications equipment for the Beaver Valley Power Station. While every specific recommendation related to the construction and equipping of Technical Support Centers cannot be embodied in a design suitable to this site, every reasonable effort has been made to incorporate into the design those features which will satisfy the intent of the requirements set forth for this item. Special consideration has been given to habitability and usefulness of the facility during accident conditions.

The specific design concept for the Technical Support Center can be summarized as follows:

* Location - The site of the Technical Support Center was chosen to take advantage of existing terrain features for shielding, to provide easy access and space to locate support trailers, and because of limited site space closer to the control room. The Technical Support Center will be located approximately 1200 feet from the Unit 1 control room.

I. Background and Summary (continued)

* Architectural Features - The building will be constructed of reinforced concrete/concrete block and will contain provision for the following functions:

1. Techical Support Center
2. Emergency Control Center
3. Emergency Communications Center
4. Near Site Operations Center
5. Dosimetry Facilities
6. Sample Preparation Room and Counting Room
7. Mobile Counting Equipment
8. Other Ancillary Functions

* Shielding - Normally habitated areas of the building will be designed to meet General Design Criteria 19 for a DBA. In addition, extra shielding will be provided for the dosimetry facility, the sample preparation room and the counting room to assure the availability of those facilities during accident conditions and to protect building occupants from the effects of a sample handling accident, should one occur within the laboratory area.

* Ventilation - The ventilation system will be arranged so that the building is isolable from the outside air. Further, the sample preparation room and counting room ventilation shall be isolable from the remainder of the building.

* Plant Monitoring Instrumentation - The information will be provided by two process computers, one associated with plant parameters and the other associated with environmental parameters. Draft Regulatory Guide 1.97, Revision 2, was used as a guide for recommended parameters to be available in the Technical Support Center. Display will be CRTs with capability to trend up to 20 parameters on graphic strip chart recorders.

I. Background and Summary (continued)

* Communications Equipment - Communications equipment will consist of radio equipment sufficient to communicate with local environmental monitoring groups and with local emergency agencies. Substantial telephone service via Bell Telephone and a 100 lin switchboard on the Duquesne Light Company PAX system will be provided. The details of the communications equipment will be defined later.

II. Siting and Architectural Features

The Technical Support Center Building will be located approximately 1200 feet from the Beaver Valley Power Station control room. This site is illustrated on the Property Development Plan attached as Figure 1. This site was chosen to take advantage of the natural shielding from containment "shine" afforded by the existing north-south highway embankment immediately adjacent to the proposed building site. Also, the distance from the plant is such that the postulated accident cloud dose is reduced at this site to levels which do not require massive shielding within the structure. This site allows good access from offsite and has ample parking space for emergency vehicles and trailers. Direct [redacted] site roads exist between this site and the control room allowing transport by auto between the two points in less than 3 minutes. This travel t[illegible]e is comparable to the walking time from the control room to other possible sites within the plant security boundary.

The building is planned to be used during nonemergency periods as quarters for engineering personnel. This nonemergency use of the facility has the advantages of providing for the assurance of continuing operability of building support systems and for the maintenance of up-to-date drawings and records for emergency use. The facility will also be used to train plant operations and emergency personnel where the Technical Support Center data acquisition system and displays will be particularly useful. In no way will these alternate uses of the facility interfere with the primary purpose of the building.

II. Siting and Architectural Features (continued)

The Technical Support Center building has been designed to satisfy the functional requirements of the Technical Support Center, the Emergency Control Center, the Communication Center and the Near Site Operations Center. The design of the building enhances the proper control and coordinaton of the principle activities of emergency operations. The establishment, as soon as is reasonably possible after an accident, of the Emergency Control Center in this building will allow close coordination of all offsite emergency activities without interfering with plant emergency operations.

The building will be equipped to process personal dosimetry devices and will have facilities to analyze reactor coolant system and containment atmosphere samples after an accident.

Figure 2 is a conceptual floor plan of the Technical Support Center building illustrating the functional areas described above. Appendix A contains a functional description of each of the significant areas of the building.

Building electrical service will be provided by underground primary service to a 3 phase, 4 wire 277/480 volt pad mounted transformer in the 300 to 500 KVA range, supplied from the Duquesne Light Company distribution system. A Diesel Emergency Generator (approximately 300 to 500 KVA) with a 1500 gallon steel underground fuel tank (48 hour supply) will be installed to provide backup power for the full building requirement. UPS and battery systems will be incorporated into the design with a 480V delta, 120/208V wye dry type transformer provided to bypass the UPS equipment via a static switch.

II. Siting and Architectural Features (continued)

The building is designed to provide shielding from the potential maximum cloud dose expected during a postulated loss of coolant accident in accordance with General Design Criteria 19. There is no expected dose component from shine from the Unit 1 containment expected because of the natural shielding provided by the highway embankment and intervening structures. The dosimetry facility will have additional shielding to permit continued use during accident conditions and the sample preparation and counting rooms will have additional shielding to prevent excessive exposure of building occupants in the event of a spill of radioactive materials in these areas.

III. Data and Acquisition System

Data acquisition and display is planned to be accomplished through the use of a separate data acquisition computer. Input to this computer will be obtained from isolated output of the reactor control racks, the reactor protection racks, the environmental monitor racks and other transducers and switch contacts. Regulatory Guide 1.97, Revision 2, was used as a guide in determining the parameters to be acquired. The digital and analog information associated with these inputs will be multiplexed and transmitted to the Technical Support Center for display.

At the Technical Support Center, two consoles will be provided consisting of a CRT, printer and keyboard. The computer will also provide output to 10-2 pen strip chart recorders. These recorders will be capable of trending any variable available to the computer.

Effluent radioactivity, area monitoring and meterlogical data will be acquired using a Nuclear Data Model 6650 dual computer system. Terminals served by this computer will be located in the plant control room, the technical support center room and the emergency control center room.

IV. Radiological Instrumentation

Sample preparation and counting facilities utilizing a Nuclear Data Model 4420 gamma spectrometry system with intrinsic germanium detector will be available in the building. We plan to provide a liquid scintillation system and gas internal proportional counters. It is also planned to maintain a reserve supply of various types of survey instruments.

V. Summary

The plans for the Technical Support Center building at Beaver Valley Support Center building at Beaver Valley Power Station were developed to provide a coordinated, functional structure and equipment, well suited to serve as the focal point of emergency control and responsive to the recommendations of the Lessons Learned Task Force.

APPENDIX A

Conceptual Description of Technical Support Center Building

1. Technical Support Center Room

This room will be sized to accommodate approximately forty (40) persons. The room will contain approximately ten (10) wall mounted 2 pen recorders. Parameter display will be through two CRT consoles for hard copy print. There will be desk space for approximately twenty-five (25) persons and sufficient flat work space to hold 4 or 5 full size drawings. Space will be included for microfilm viewer or projector.

2. Computer Room

This room will contain sufficient room for computer and process racks, programmer's desk and files, communications and tone equipment, also computer and recorder parts, supplies and a work table.

3. Emergency Control Center Room

This room will contain site and area maps and will have desk space for five (5) to ten (10) persons. This area will contain one CRT terminal and printer, teletype and a telecopier. This room will be located adjacent to the Technical Support Center Room.

4. Emergency Communications Center Room

This room will contain working space for a minimum of five persons and should have two CRT terminals and will house the radio communication control equipment. Each work position will have space for several telephones.

5. Emergency Director's Office

This office will have direct access to and visual observation of the Technical Support Center Room and the Emergency Control Center Room. This room should be large enough to seat twelve (12) persons for briefings.

6. Near-Site Emergency Coordination

This area will be sized to contain 10 two-man office cubicles for government liaison officials plus one office cubicle for the Duquesne Light Company liaison representative. This area will be fully equipped with telephone service, teletype and telecopies service. This room will be in reasonably close proximity to the Emergency Director's Office, the Technical Support Center Room and the Emergency Control Center Room.

7. Auxiliary Facilities Rooms

a. Kitchen

This room will contain a sink, two small microwaves, one 2-4 burner range and one freezer/refrigerator combination.

b. Records Room

This room will contain a set of as-built station drawings, a complete set of station manuals, the FSAR, a comprehensive set of vendors manuals and instruction books will also be available.

c. Sleeping Quarters

For 8-10 persons (fold-up cots acceptable).

d. Medical Facilities

One bed, one first-aid cabinet and sink.

e. Garage for Monitoring Van

f. Reception Room and Security Room

g. Mechanical Equipment Room HVAC, etc.

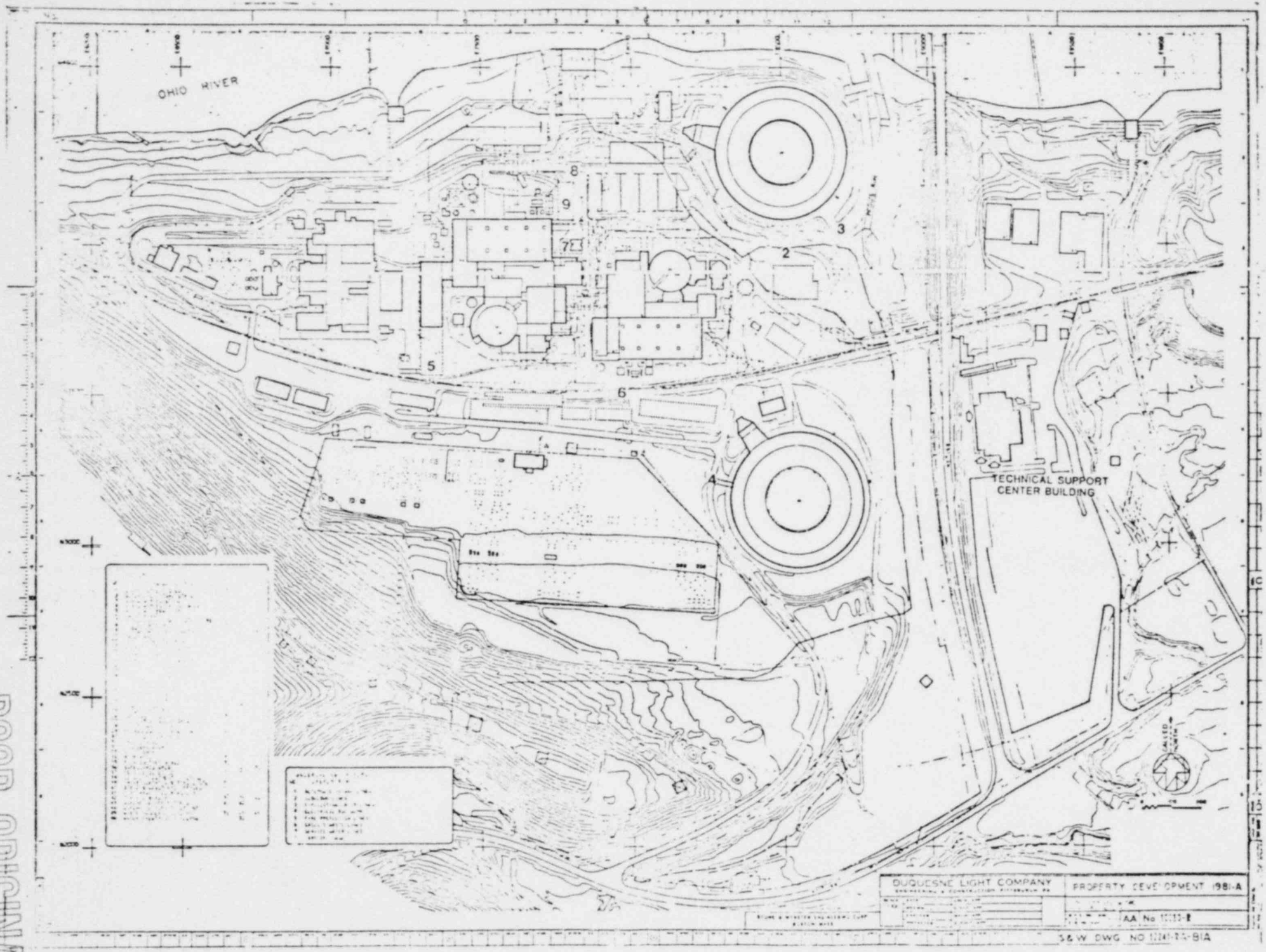
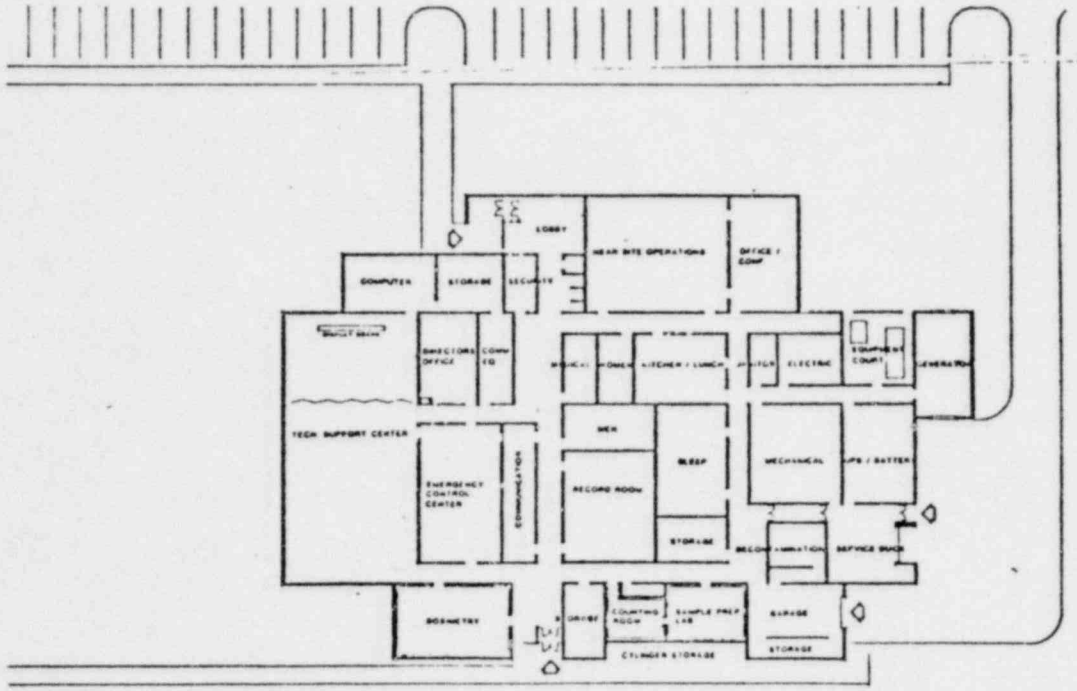


FIGURE 1



FLOOR PLAN

NORTH

DUQUESNE LIGHT COMPANY | TECHNICAL SUPPORT CENTER BUILDING

A.A. NO.

FIGURE 2