4.0 DESIGN FEATURES

4.1 SITE

4.1.1 Exclusion Area Boundary (EAB)

The EAB is approximately 1000 meters from the midpoint between the containment buildings. The exclusion area shall be as shown in figure 4.1-1.

4.1.2 Low Population Zone (LPZ)

The LPZ is that area falling within a 2500 meters radius from the midpoint between the containment buildings. The low population zone shall be as shown in figure 4.1-2.

4.2 Containment

4.2.1 Configuration

The reactor containment building is a steel lined, reinforced concrete building of cylindrical shape, with a dome roof and having the following design features:

A. Nominal inside diameter = 39.62 m (130 feet)

B. Nominal inside height = 59.44 m (195 feet)

C. Minimum thickness of concrete walls = 1.22 m (4 feet)

D. Minimum thickness of concrete roof= 96.52 cm (3 feet, 2 inches)

E. Minimum thickness of concrete floor pad = 45.72 cm (1.5 feet)

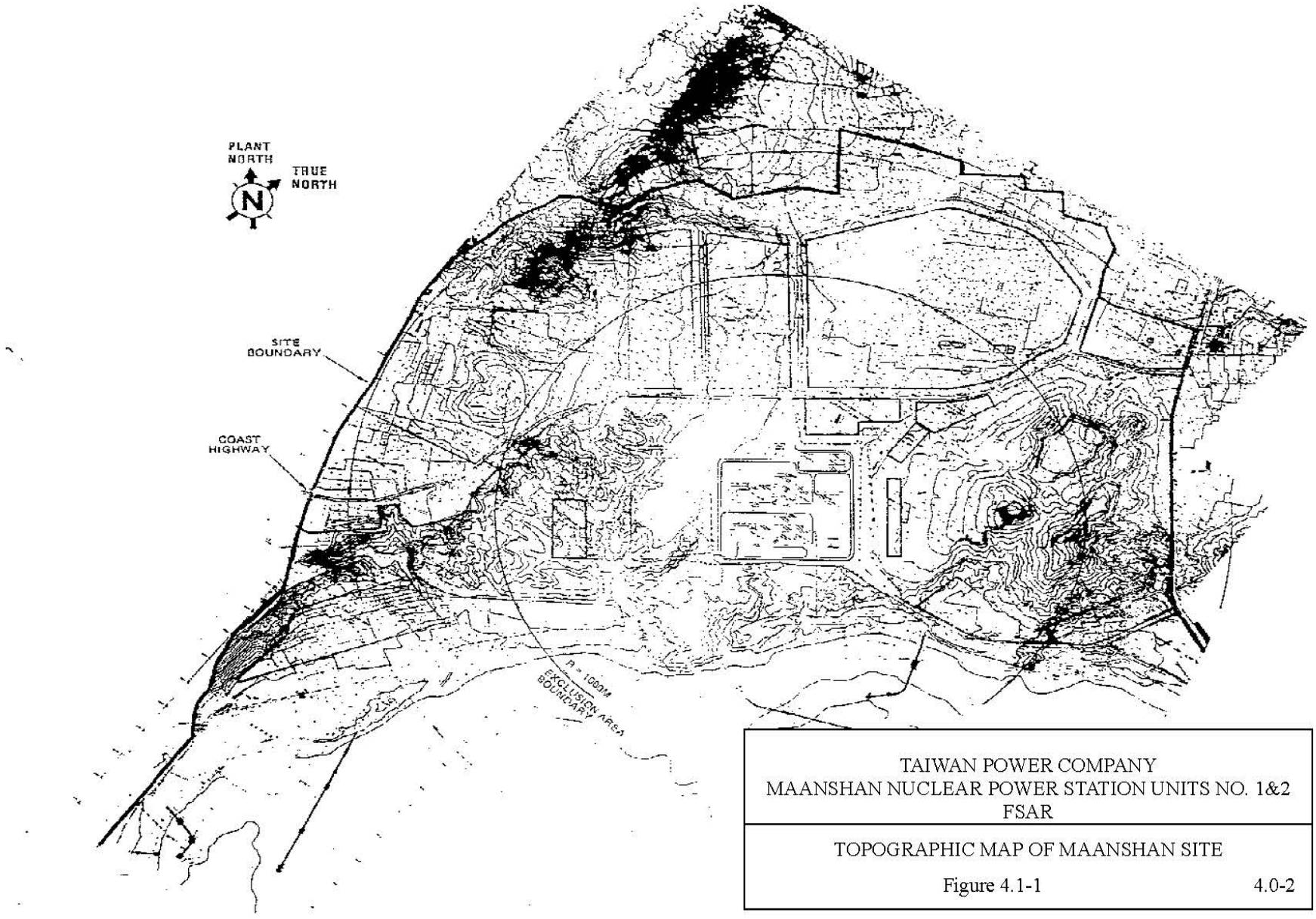
F. Nominal thickness of steel liner = 0.635 cm (0.25 inches)

G. Minimum net free volume = 57483.2 m^3 (2.03×10^6 cubic feet)

4.2.2 Design Pressure and Temperature

The reactor containment building is designed and shall be maintained for a maximum internal pressure of 4.22 kg/cm^2 (60 psig) and an internal temperature of 148.9℃ (300°F).

4.0 DESIGN FEATURES

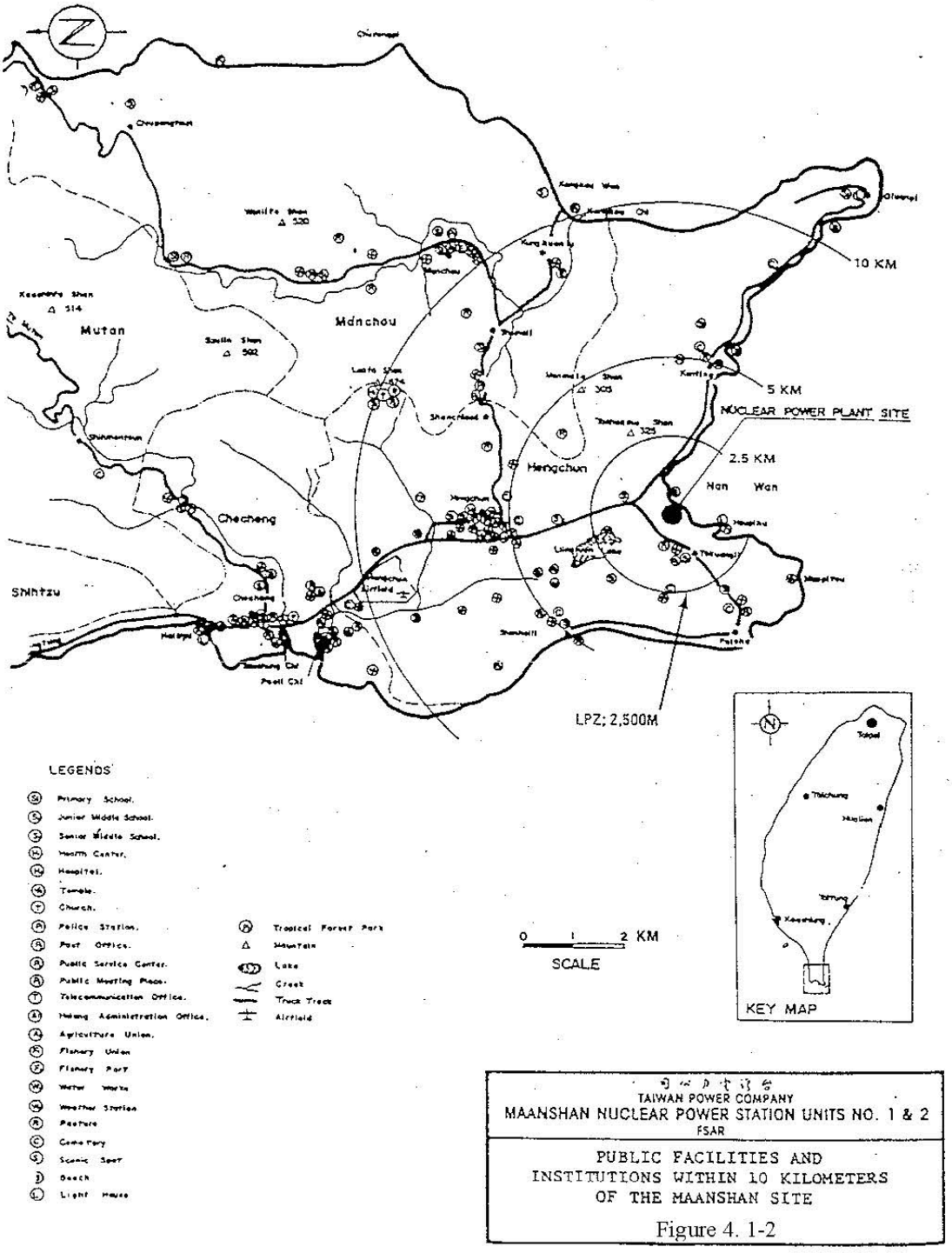


TAIWAN POWER COMPANY
MAANSHAN NUCLEAR POWER STATION UNITS NO. 1&2
FSAR

TOPOGRAPHIC MAP OF MAANSHAN SITE

Figure 4.1-1 4.0-2

4.0 DESIGN FEATURES



TAIWAN POWER COMPANY
MAANSHAN NUCLEAR POWER STATION UNITS NO. 1 & 2
FSAR

PUBLIC FACILITIES AND
INSTITUTIONS WITHIN 10 KILOMETERS
OF THE MAANSHAN SITE

Figure 4. 1-2

4.0 DESIGN FEATURES

4.3 REACOR CORE

4.3.1 Fuel Assemblies

The reactor core shall contain 157 fuel assemblies each fuel assembly shall consist of a matrix of Zircaloy-4 or ZIRLO^{TM} clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide as fuel material. Limited substitutions of zirconium alloy or ZIRLO^{TM} or stainless steel filter rods for fuel rods, in accordance with ROC-AEC approved applications of fuel rod configurations, may be used. Each fuel rod shall have a nominal active fuel length of 3.66m (144 inches). 1

Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable ROC-AEC staff-approved codes and methods, and shown by tests or analyses to comply with all fuel safety design bases.

4.3.2 Control Rod Assemblies

The reactor core shall contain 52 full-length control rod assemblies. The full-length control rod assemblies shall contain a nominal 3.61 m (142 inches) of absorber material. The absorber material shall be Ag-In-Cd. The composition of Ag-In-Cd shall be 80 weight percent silver, 15 weight percent indium, and 5 weight percent cadmium.

4.4 REACTOR COOLANT SYSTEM

4.4.1 Design Pressure and Temperature

The reactor coolant system is designed and shall be maintained in accordance with the following:

A. Code requirements specified in section 5.2 of the FSAR, with allowance for normal degradation pursuant to the applicable surveillance requirements.

B. A pressure of 174.71 kg/cm^2 (2485 psig).

C. A temperature of 343.3℃ (650°F), except for the pressurizer, which is 360.0℃ (680°F).

4.4.2 Volume

The total water and steam volume of the reactor coolant system is 266.5 ±2.83 m^3 (9410 ±100 cubic feet) at a nominal T_{avg} of 309.2℃ (588.5°F)

4.5 FUEL STORAGE

4.5.1 CRITICALITY

4.5.1.1 The spent fuel storage racks are designed and shall be maintained as follows:

A. A Keff equivalent to less than 1.0 when flooded with unborated water, which includes a conservative allowance for uncertainties, as described in section 4.3 of the FSAR.

B. A Keff equivalent to less than or equal to 0.95 when flooded with water borated to 650 ppm, which includes a conservative allowance for uncertainties, as described in section 4.3 of the FSAR.

C. A nominal 28.65cm (11.28-inch) and 22.90cm (9.02-inch) center-to-center distance between fuel assemblies placed in the Region 1 and 2 storage racks respectively. Racks 1A through 1D are designated as Region 1 as shown in Figure 4.5-1, Racks 2A through 2T are designated as Region 2 as shown in Figure 4.5-1.

D. Region 1 is used to store fuel assemblies with maximum planar-average initial nominal enrichment up to 4.95 weight percent U-235.

E. Category A fuel assemblies (fuel assemblies with a burnup above the curve in Figure 3.7.17-1) can be stored anywhere in Region 2 next to other Category A fuel assemblies.

F. Category B fuel assemblies (fuel assemblies with a burnup below the curve in Figure 3.7.17-1) must be stored in Region 2 directly adjacent to water filled holes on its four sides, or stored in Region 1.

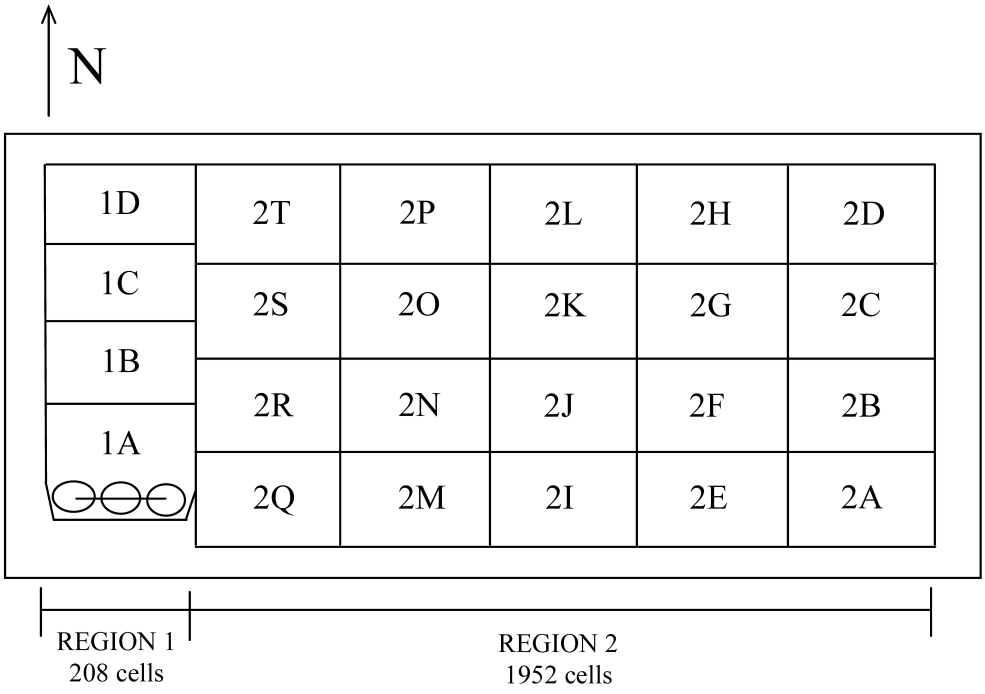
4.5.1.2 The fuel stored in new fuel storage racks shall have enrichment no greater than 5.00 weight percent U-235. The keff for the new fuel rack shall be less than 0.95 when flooded with unborated water,and0.98 when aqueous foam moderation is assumed, respectively.

4.5.2 DRAINAGE

The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 44.04m (144 feet-6 inches).

4.5.3 CAPATICY

The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 2160 fuel assemblies.



台灣電力公司 TAIWAN POWER COMPANY MAANSHAN NUCLEAR STATION UNITS NO. 1 & 2 FSAR
GENERAL SPENT FUEL POOL LAYOUT Figure 4.5-1