

# Regulatory Control of Decommissioning of Nuclear Reactor Facilities in Taiwan

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## License Period of Nuclear Power Plant

Based on the definition in the Nuclear Reactor Facilities Regulation Act (NRFRA), the term of "decommissioning" refers to the various measures that shall be taken after the permanent cessation of operation of a nuclear reactor facility, to enable that site to be utilized again.

There are 3 twin-reactor NPPs in operation in Taiwan, which are Chinshan NPP, Kuosheng NPP, and Maanshan NPP. The dates of permanent cessation of the above NPPs are shown in Table 1.

Table 1. Dates of Permanent Cessation of NPPs in Taiwan

NPS	Reactor	Dates of Permanent Cessation
Chinshan NPS	No .1	Dec. 05, 2018
	No. 2	July 15, 2019
Kuosheng NPS	No .1	Dec. 27, 2021
	No. 2	Mar. 14, 2023
Maanshan NPS.	No .1	July 26, 2024
	No. 2	May 17, 2025

## Policy and Regulations for Decommissioning of Nuclear Reactor Facilities

According to the Policy on Management of Decommissioning of Nuclear Reactor Facilities promulgated by Executive Yuan in 1991, the dismantlement approach was adopted as the strategy for the decommissioning of nuclear reactor facilities.

The Nuclear Reactor Facilities Regulation Act (NRFRA), promulgated in January 2003, stipulated the regulations for the decommissioning of Nuclear Reactor Facilities, from Article 21 to Article 28. Atomic Energy Council (AEC) also promulgated the Enforcement Rules for the Implementation of Nuclear Reactor Facilities Regulation Act in August 2003. The Enforcement Rules for the Implementation of NRFRA established the standards for the radiation dose limit of a post-decommissioning nuclear reactor facility site and the guidelines for the environmental radiation monitoring report.

Furthermore, in July 2004, AEC promulgated the Regulation for the Review and Approval of Applications for Decommissioning Permit of Nuclear Reactor Facilities, which stipulated the procedures of applying for a decommissioning permit. AEC has issued the guidelines(standard format and contents) of decommissioning plan in Dec. 2012. AEC has also issued the draft version of standard review plan for decommissioning plan in Dec. 2013. AEC issued the revised version of guidelines and standard review plan for decommissioning plan in Sep. 2014.

From the experience of the decommissioning of foreign nuclear reactor facilities, the site land can be recovered and the non-radiological facility can be reutilized. According to the regulations, the decommissioning of nuclear reactor facilities in Taiwan shall adopt the dismantlement approach. The scope of dismantlement shall include contaminated equipment, structures and materials. The radiation level of the decommissioned site shall conform to the requirements set by AEC.

### **Major Requirements for the Decommissioning of Nuclear Reactor Facilities**

Based on the Regulations for the Review and Approval of Applications for a Decommissioning Permit of Nuclear Reactor Facilities, the utility (Taiwan Power Company, TPC) shall submit an application form to the AEC for review, with a decommissioning plan and a financial guarantee statement enclosed and pay the licensing fee.

According to the Environmental Impact Assessment Act, TPC shall conduct the environmental impact assessment (EIA) for decommissioning nuclear reactor facilities. Therefore, the EIA approval document, issued by the Environmental Protection Agency, shall be submitted to the AEC before AEC issues the Decommissioning Permit.

The important requirements for the decommissioning of nuclear reactor facilities are summarized as follows:

- 1.The decommissioning of nuclear reactor facilities shall adopt the dismantlement approach and shall be completed within the period prescribed by the AEC. The scope of the dismantlement shall include all radioactively contaminated equipment, structures, and materials.
- 2.As to the decommissioning of nuclear reactor facilities, the radiation dose for the site of dismantled facilities shall comply with the standards prescribed by AEC.
- 3.For the decommissioning of nuclear reactor facilities, an application, enclosed with the decommissioning plan, shall be filed by the utility, and the decommissioning shall not commence until the application has been reviewed and approved by AEC to comply with the following requirements and a decommissioning permit has been granted:
  - (1)The activities of decommissioning shall be sufficient to protect the public health and

safety;

(2)The environmental protection and ecological protection shall comply with the relevant laws and regulations;

(3)The activities of radiation protection and the management of radioactive materials shall comply with the relevant laws and regulations;

(4)The technical ability, the management ability and the financial status of the applicant shall be considered competent to execute the decommissioning.

The decommissioning plan for nuclear reactor facilities shall be submitted by the utility three years prior to the scheduled permanent cessation of operation. If nuclear reactor facilities are not going to be operated continually within the valid period of the operating license, then the utility shall submit the decommissioning plan within three years after the permanent cessation of operation.

4.After the decommissioning permit has been obtained from the AEC, the utility shall execute the decommissioning according to the approved plan. Once the decommissioning plan has been approved, any amendment, involved in significant safety issues, shall be submitted to and approved by the AEC before amendment.

5.Within six months of completion of the decommissioning plan of nuclear reactor facilities, the utility shall submit to AEC for review the report on environmental radiation monitoring for the post-decommissioned site.

### **Review Procedure of Decommissioning of Nuclear Reactor facilities**

According to the Nuclear Reactor Facilities Regulation Act (NRFRA), TPC shall submit the decommissioning plan at least three years prior to the scheduled permanent cessation of operation of a nuclear power plant. The decommissioning of a nuclear reactor facility shall be completed within twenty-five (25) years upon obtaining the decommissioning permit.

The regulatory control process for the decommissioning of a nuclear reactor facility can be divided into three stages, which are preparation stage, decommissioning stage and recovery stage.

### **Current Decommissioning Status of Chinshan NPP**

The Chinshan NPP will be permanently shutdown in December 2018. Therefore TPC has submitted the Chinshan NPP Decommissioning Plan to AEC for review and approval in November 2015 in accordance with requests of the Nuclear Reactor Facilities Regulation Act (NRFRA), The review tasks of the decommissioning plan include acceptance review and technical review. The acceptance review was completed in December 2015. The overall review tasks is expected to be completed in June 2017.

### **Inspection during Decommissioning of Nuclear Reactor facilities**

During the decommissioning of a nuclear reactor facility, AEC may inspect the decommissioning activity at any time, and require the utility to submit relevant documents. The utility shall not evade, obstruct, or refuse the inspection. If anything does not conform to the regulations or if public health, safety or the environment may be endangered, AEC shall order the utility to improve the situation within a limited time or to take any necessary measures. If the utility does not improve within the specified time or if the situation is serious, AEC may order the utility to cease decommissioning activity or may punish the utility by an administrative penalty.

### **Radiation Level for Decommissioning of Nuclear Reactor facilities**

According to Enforcement Rules for the Implementation of Nuclear Reactor Facilities Regulation Act (NRFRA), the radiation doses in the post-decommissioned site of nuclear reactor facility shall comply with the following limits:

1. For the restrictive use, the annual dose equivalent exposure to the general public shall not exceed 1 mSv.
2. For the non-restrictive use, the annual dose equivalent exposure to the general public shall not exceed 0.25mSv.

These two radiation dose limits in the post-decommissioned site are the same as those of the USA.