

Regulatory Requirements for the Licensing of Dry Storage Facility for Spent Nuclear Fuel

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Abstract

The Taiwan Power Company (TPC) Chin-Shan NPP's spent fuel pool will lose full core capacity in February 2010. TPC has decided to construct an on-site spent fuel dry storage facility to cope with the shortage of the pool capacity. TPC expects to submit the application of construction license in 2006, start test run in 2008 and receive approval of the operation license in 2009. This paper shows the domestic regulatory requirements for the licensing of an interim storage facility for spent nuclear fuel. An example on the construction license of the applicant's filing and the authority's reviewing work is introduced as well.

Keywords: spent fuel, dry storage, safeguard

I Introduction

The Taiwan Power Company (TPC) Chin-Shan NPP's spent fuel pool will lose full core capacity in February 2010 despite the plant has completed the re-racking project. For safety reason, TPC decide to launch a project of installing an on-site spent fuel dry storage facility for solving the shortage of the pool capacity. According to Taipower's planning schedule, TPC will submit the application of construction license in 2006, finish the fabrication of the first storage cask and perform test run in 2008, and expect to receive approval of operation license in 2009. The first stage of this project will store 1,366 BWR fuel bundles before the year of 2012. This paper shows the regulatory requirements, reviewing procedure, and an example of the construction license.

II Regulation

The domestic regulations for installation of the spent fuel dry storage facility include Act, Enforcement Rules, Charging Standard, Regulations for the Review and Approval of Applications for Construction License and Regulation for Safeguards. All of them regulate the competency of applicants, the necessary requirements for applications, content of application documents, reviewing process and schedule etc. The standing regulations of the Atomic Energy Act, Ionizing Radiation Protection Act, Nuclear Reactor Facilities Regulation Act and Nuclear Emergency Response Act and their applied regulations shall be respected too. The core regulation for licensing is “The Nuclear Materials and Radioactive Waste Management Act” as well as the applicable regulations are summarized in Table 1. All of the related regulations will be briefly introduced as follows:

1. The Nuclear Materials and Radioactive Waste Management Act (Act)

The Act constraints the rights vested in the license, requires the facility to be inspected or monitored according to the relevant nuclear safeguard treaties. The construction shall satisfy peaceful use, secure the public health and safety, and meet the environmental protection laws and competent to operate the facility by the applicant. The competent authorities are required to display the application documents to the public and then hold a hearing.

The conditions for the granting of an operation license are qualified construction, pre-operation test result and have issued for an operation license. The valid period of an operation license is 40 years. To safely operate the facility, qualified operators are required. The applicant shall submit the reports and records regularly and the authority may dispatch inspectors to site as necessary, and take necessary measures when the situations warrant. The facility design amendment or the equipment change that involves significant safety items shall receive prior approval from the competent authority before implementation.

As for the enforcement provision, applicants that violate the Act to construct the facilities arbitrarily will be fined up to ten millions NT dollars and/or be punished up to one year of imprisonment.

2. Enforcement Rules for the Nuclear Source Materials and Radioactive Waste Management Act (Enforcement Rules)

The Enforcement Rules are complimentary to the Act. The rules not only regulate the applicant to submit the test run plan, operation license application documents for operational license, but also request the competent authorities to finish examination of the operation license application within 3 months. The contents of safety evaluation report for license renewal, decommissioning plan, periodical reports & records, and information request for abnormal or emergency events are also addressed.

3. Charging Standard for Control of Nuclear Material and Radioactive Waste
(Charging Standard)

The Charging Standard includes the licensing fees, annual inspection fees, and licensing fee for spent nuclear fuel cask by application.

4. Regulations for the Review and Approval of Applications for Construction License of Radioactive Wastes Treatment, Storage and Final Disposal Facilities
(Regulation of Construction)

The regulations define the qualified applicant, application process, content of the Safety Analysis Report (SAR), scope of the financial guarantee statement, public hearing schedule, radiation protection requirements and construction license review time.

5. Regulation for the Nuclear Safeguards Operation

The regulation sets the requirements for applicant to assign a special organization and designator in charge of the nuclear safeguarded materials and inventory to submit the nuclear safeguarded materials variance result monthly and the nuclear safeguards materials balance record semi-annually.

III Useful regulations from abroad in reviewing work

In the U.S., there are about 30 spent fuel dry storage facilities in operation, using about 20 different storage cask designs. The lesson learned in this area of building storage installations is very valuable to us. If the applicant selects a mature technology from other countries, the original country's regulations, licensing documents, and applied industrial codes will be treated as important reference document. For examples, U.S. regulations : 10CFR72, R.G.-3.48, R.G.-3.62, NUREG-1536, NUREG-1567, Generic Letters, Information Notice, Bulletin, Spent Fuel Project Office Interim Staff Guidance can be used as guidance during review work. The feedback data of the operational experiences from other countries are useful reference also.

However, the facilities structures and components designed to withstand all domestic normal and off-normal conditions created by earthquakes, flooding, and other site-specific phenomena shall be assessed in the application.

IV Apply and review in construction license

The Environmental Evaluation Report of the Spent Fuel Interim Storage Plan of Chin-shan(CS) NPP's had been approved in 1995, but the construction didn't commence within three years period. According to the Environmental Protection Act Article-16 the developer shall submit an analysis of the difference between current environmental conditions and the ones at the time its development activity permission was granted and a strategy evaluation report to the competent authority for

review. For construction license of Chin-Shan NPP Spent Fuel dry storage project, the recognized environmental impact document is necessary in the application process. In the following part, the application and review process of the construction license will be addressed.

The applicant shall submit an application form enclosed with a safety analysis report, a financial guarantee statement and the recognized relevant environmental impact data to competent authority for review. The authority will check the applicant's qualification, financial capability and the soundness of SAR (safety analysis report), then review the purpose of the facility for consistency with the peaceful use, ensure the security and safety of the equipments and facilities, evaluate the impact to environmental ecology and check the applicant's technology, management and financial basis that are competent to operate the facility. If the above issues are accepted, the authority will inform the applicant to render the licensing fee. In the meanwhile, the authority will carry out technical review of SAR. According to the Act Article 8, the application information shall be publicized and displayed within 30 days and the time period for publication and display is 60 days. During the time period for publication and display, individuals, government agencies or organizations may submit to the competent authorities reference opinions in written document stating the name or appellation and the address; and a hearing (or hearings) shall be held by the competent authorities subsequently, later on the authority shall compile the transcript of the public hearing within thirty days. Fig1. shows construction license reviewing process.

The SAR review team (RT) associates with the review work steering committee (RWSC) will perform the technical review of SAR. Five critical safety issues including structural safety, containment integrity, heat removal, criticality safety and shielding design will be fully examined by the review team. Three RWSC meetings and several times of RT review meetings will be held. The three RWSC meetings are to make sure of the accreditation of the application document and reviewing schedule & plan, verifying the safety evaluation report (SER), and ensuring the summary report enclosed with the public hearing record and SER.

V Discussions

1. The domestic regulation frames for the licensing of the subject application and the technical review basis have been set up. R.G.-3.48, R.G.-3.62, NUREG-1536, and NUREG-1567 can serve as useful references for license application.
2. Being lack of the experience to hold the public hearing meeting in this country, a study report contracted with The Law School of Taipei University has completed last year. The study has provided a sound basis to set up the hearing procedures required by the Act. All stakeholders can participate the meeting with which provides a platform for dialogue among environment groups, project undertakers and the regulators.

3. After 911, we believe that it is essential for the applicant to evaluate some site-specific issues on nuclear safety and safeguards in order to soothe the public concern.

VI Conclusion

The construction of a dry storage facility for spent fuel has been chosen as a mid-term, preferred solution for this country. Choosing a system that is already licensed can be helpful to speed up licensing, but precautions must be taken when applicant make modifications of system design. Local conditions or events that may contribute risk to the public should be assessed. In addition, local public acceptance is a critical factor for applicants to consider. Guaranteeing stringent safety standards, transparency, public participation over the licensing of the facility are our most important concerns.

REFERENCES:

- (1) The nuclear materials and radioactive waste management act
- (2) Enforcement Rules for the Nuclear Source Materials and Radioactive Waste Management Act
- (3) Charging Standard for Control of Nuclear Material and Radioactive Waste
- (4) Regulations for the Review and Approval of Applications for Construction License of Nuclear Source Material and Nuclear Fuel Production and Storage Facilities
- (5) Regulations for the Review and Approval of Applications for Construction Radioactive Wastes Treatment, Storage and Final Disposal Facilities

Table 1 Summary of the act and applicable regulations

	Act	Enforcement Rule	Regulations of construction	Regulations for safeguard	Charging standard
Construction	A-8: Application requirement, documents publicize, public hearing		A-2: qualification of the applicant A-3: Application process A-4: SAR contents A-6: financial statement A-8: public hearing A-9: review period A-12: license payment	A-7 special organization & designator in charge of A-8 materials variance result A-9 materials balance record	A-6: review: 5M inspection: 1M/y cask: 1M/appl.
Operation	A- 9: valid period of license Article 10:report and record A-11:operation by qualified operator A-12: design amendment in the safety items A-13 : urgent situation management	A-8: Test run plan and operation license application information A-10: license renew A-12: periodical reports and records	A-13: dose limit		A-6: review : 5M inspection:1M/y
Decommission	A-14: cease of operation and decommission	A-11: contents of decommission plan			A-6: review : 5M inspection: 1M/y
Penal provision	A-33: construct arbitrarily or resume arbitrarily				
Nuclear safeguard	A-7: inspection and monitoring				
Others	A-6: rights in the license				

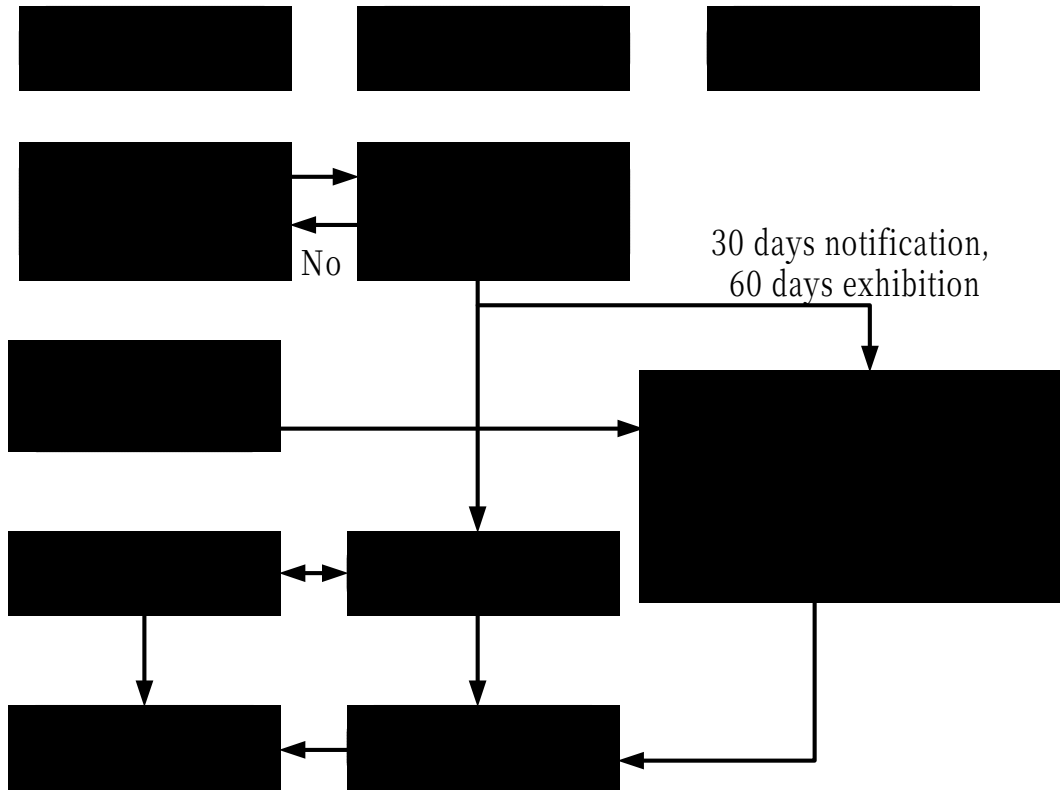


Fig 1.Flow Chart for Construction License Reviewing Process