The 19th Pacific Basin Nuclear Conference (PBNC 2014)

Plenary IVA: Fulfilling the Promise – Regulatory Trends;
Trends in Regulatory Requirements to Ensure Safe Operation of NPPs

# Regulatory Oversight on Nuclear Safety in Taiwan

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# Content

- Overview of Safety Requirement in Taiwan
- Taiwan Nuclear Power Installation
- Timeline of Lungmen Plant
- Post-Fukushima Safety Requirement
- Safety Regulation of Life Extension
- Education/ Public Outreach/ Transparency
- Conclusions and Recommendations

# Overview of Safety Regulation in Taiwan

- Monitor safe operation of the existing plants
- Safety enhancement following the Fukushima accident — Back fitting for beyond-design-basis events
- Brace for license renewal
- Bolster regulatory legal framework
- Keep boosting safety culture
- Public outreach and communications

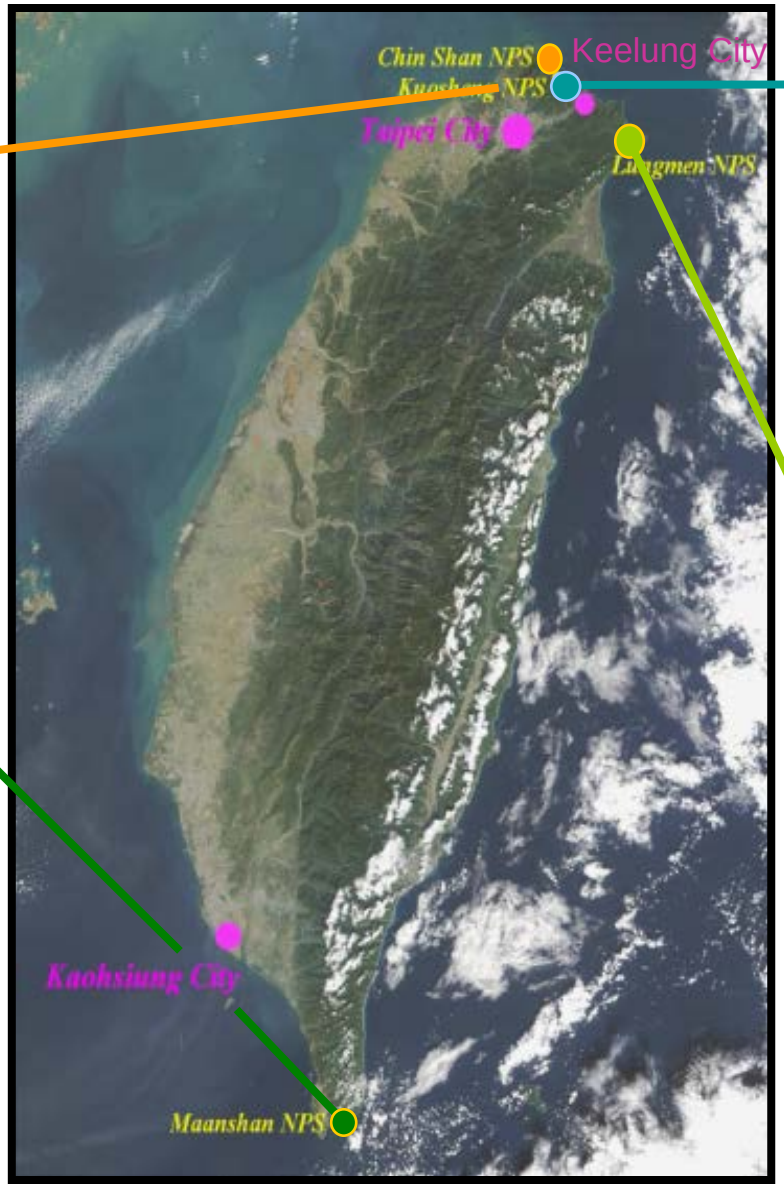
# Taiwan Nuclear Power Installation

## Chinshan NPS

**GE BWR-4 1804 MWt × 2**
**Commercial**
**Dec-1978 Unit 1**
**Jul-1979 Unit 2**

## Maanshan NPS

**WH 3-loop PWR**
**2822 MWt × 2**
**Commercial**
**Jul-1984 Unit 1**
**May-1985 Unit 2**




## Kuosheng NPS

**GE BWR-6 2943 MWt × 2**
**Commercial**
**Dec-1981 Unit 1**
**Mar-1983 Unit 2**

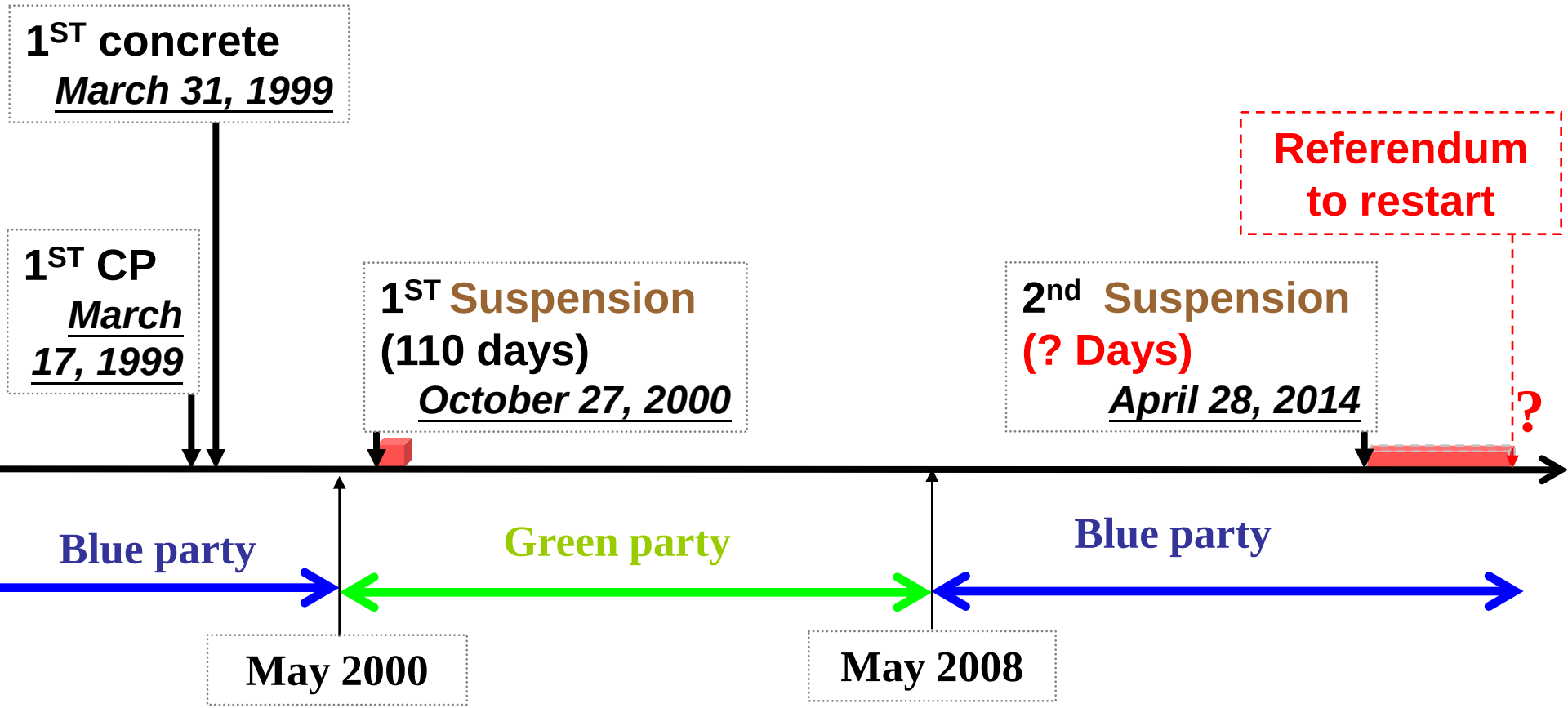
## Lungmen NPS

**GE ABWR 3926 MWt × 2**
**Under construction**
**Plan to suspension work**

# Taiwan Nuclear Power Installation (Cont.)

| Reactor Name | Type | Capacity (MW, net) | Construction Start | Commercial Operation | OL Expiration |
|---|---|---|---|---|---|
| CS, Unit 1 | BWR-4 | 604 | 1972-6 | 1978-12 | 2018-12 |
| CS, Unit 2 | BWR-4 | 604 | 1973-12 | 1979-7 | 2019-07 |
| KS, Unit 1 | BWR-6 | 985 | 1975-11 | 1981-12 | 2021-12 |
| KS, Unit 2 | BWR-6 | 985 | 1976-3 | 1983-3 | 2023-3 |
| MS, Unit 1 | WH 3Loop PWR | 926 | 1978-8 | 1984-7 | 2024-7 |
| MS, Unit 2 | WH 3Loop PWR | 928 | 1979-2 | 1985-5 | 2025-5 |
| LM, Unit 1 | GE ABWR | 1300 | 1999-3 | ? | |
| LM, Unit 2 | GE ABWR | 1300 | 1999-8 | ? | |

# Timeline of Lungmen Plant

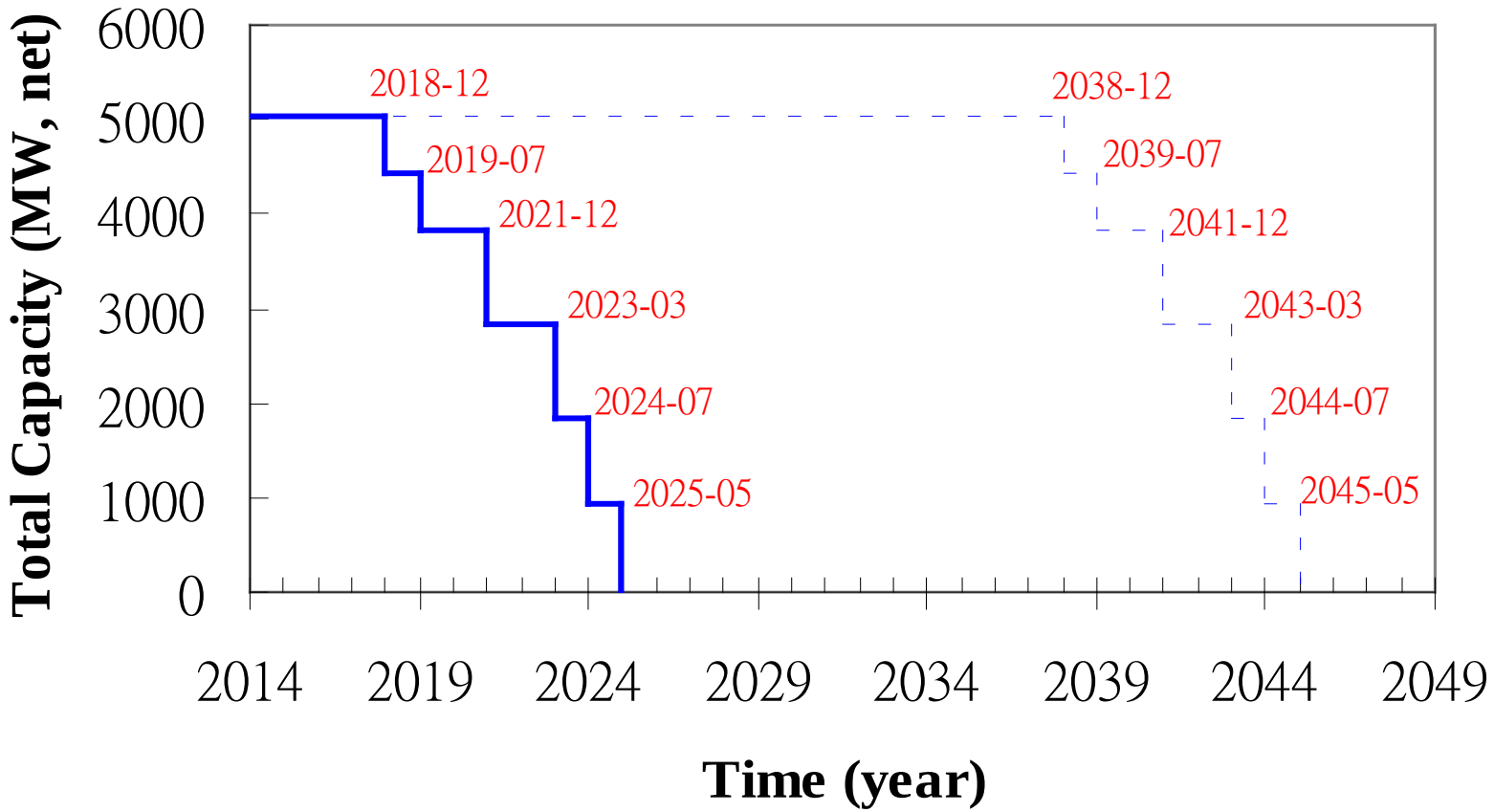



- **Unit 1：95.81% completion** (June 30, 2014)
- **Unit 2：91.51% completion** (June 30, 2014)

# Post-Fukushima Safety Requirement

- Enhance the capability to cope with Beyond DBAs-highly unlikely with severe consequences, including the multi-unit effects of nuclear power plants
  - **Earthquake**: seismic isolation ERC, seismic enhancement
  - **External Flooding**: tsunami wall, watertight of essential buildings, openings and penetrations
  - **Electrical Power**: watertight of 5th EDG Building, movable DGs and installed connectors
  - **Cooling Water**: movable pumps and installed injection joints
  - **Containment Integrity**: filtered containment venting system (FCVS)

# Safety Regulation of Life Extension (1/2)



# Safety Regulation of Life Extension (2/2)

- Nuclear Reactor Facilities Regulation Act (*Article 6*)
  - An application for renewing the license shall be filed by the licensee
- Regulations on Applications for Operating License of Nuclear Reactor Facilities (*Article 16*)
  - Submission deadline : 5~15 years prior to the expiration of the existing license.
  - Contents of application
    - ✓Integrated Plant Assessment (IPA)
    - ✓Time-Limited Aging Analysis (TLAA)
    - ✓Updated Final Safety Analysis Report (UFSAR )
- Technical Review Reference
  - USNRC regulation 10 CFR 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants”

# Education/ Public Outreach/ Transparency

- Hold science camps for school teachers and students
- Deliver nuclear and radiation seminars to schools, communities , and mass media
- Establish government's e-learning website for civil servants
- Free access of regulatory information
- Encourage public involvement in the regulatory process.

# Conclusions and Recommendations

- As a regulator, we have responsibility to remind people who may have doubts or apprehensions about nuclear power that plants can be built and operated safely.
- Complacency and hubris are the worst impediment to nuclear safety. Keep improving safety.
- Nuclear power plants should be ready to respond to a wide-spanning natural disaster. However, in responding to such a highly freakish event as Fukushima, one has to be realistic. Overregulation or underregulation clearly is not a good answer!