License Renewal Review of Chinshan NPP in Taiwan

2010 AEC/NRC Bilateral
Technical Meeting May 4, 2010

Outline

- Background
- Rule and Regulation of LR Application
- Taiwan License Renewal Review Process
- Current Status of CS LR Review
- Issues of Concern
- Concluding Remarks

Background

- Operation licenses of Chinshan (the first NPP in Taiwan) units 1&2 will expire in 12/5/2018 and 7/15/2019 respectively.
- Taipower company has submitted LR application of Chinshan units 1&2 in 7/27/2009.
- Acceptance review was completed in Sept. 20, 2009.
- Techanical Review period is scheduled to be 24 month starting from Sep.21, 2009.

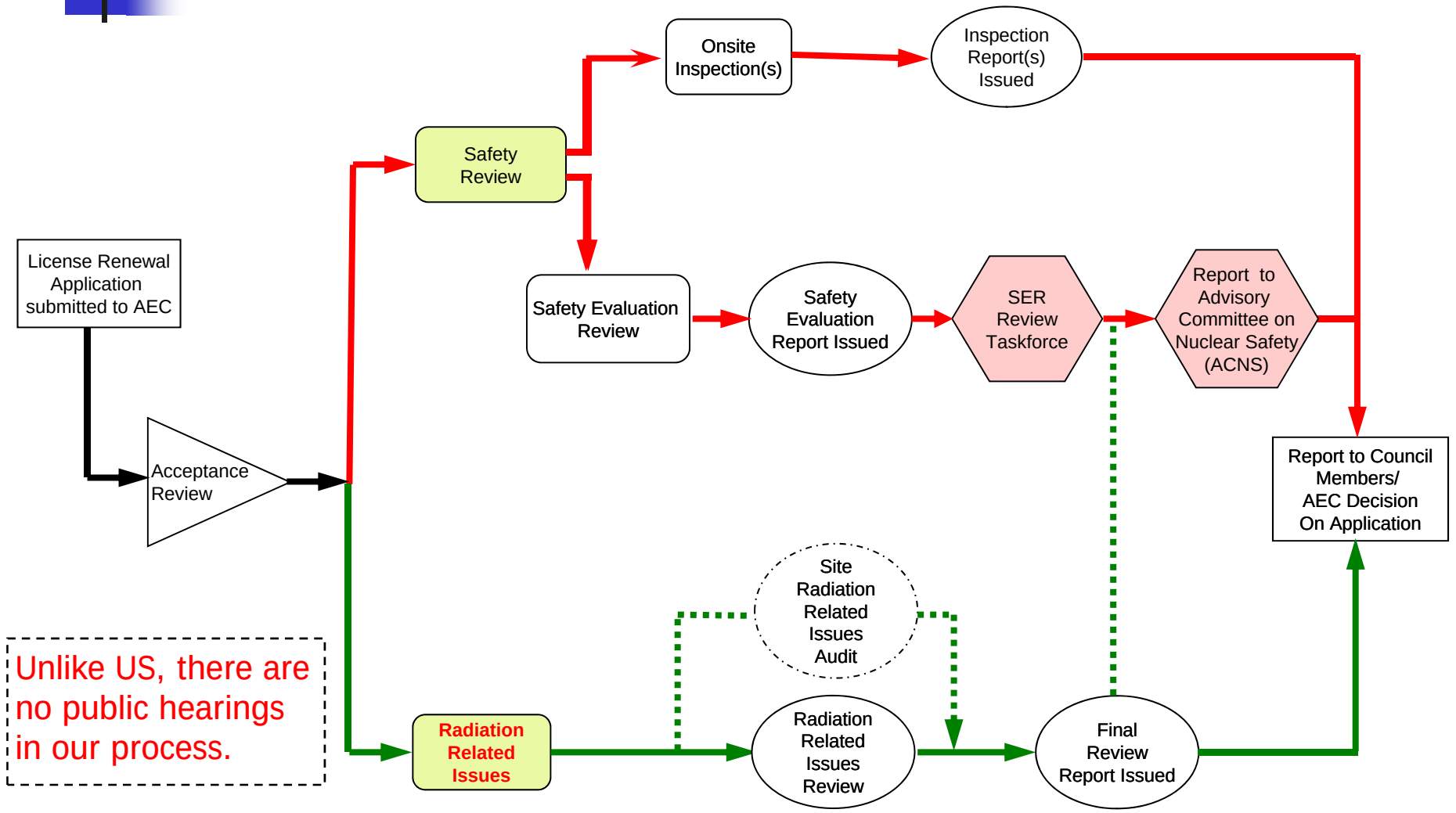
Rule and Regulation of LRA

- **According to Nuclear Reactor Facilities Regulation Act *Article 5&6***
  - The valid period of the operating license shall be forty years at longest.
  - When there is need to continue operation after the license is expired, an application for renewing the license thereof shall be filed by the licensee with the competent authorities within the period prescribed by the competent authorities.

Rule and Regulation of LRA

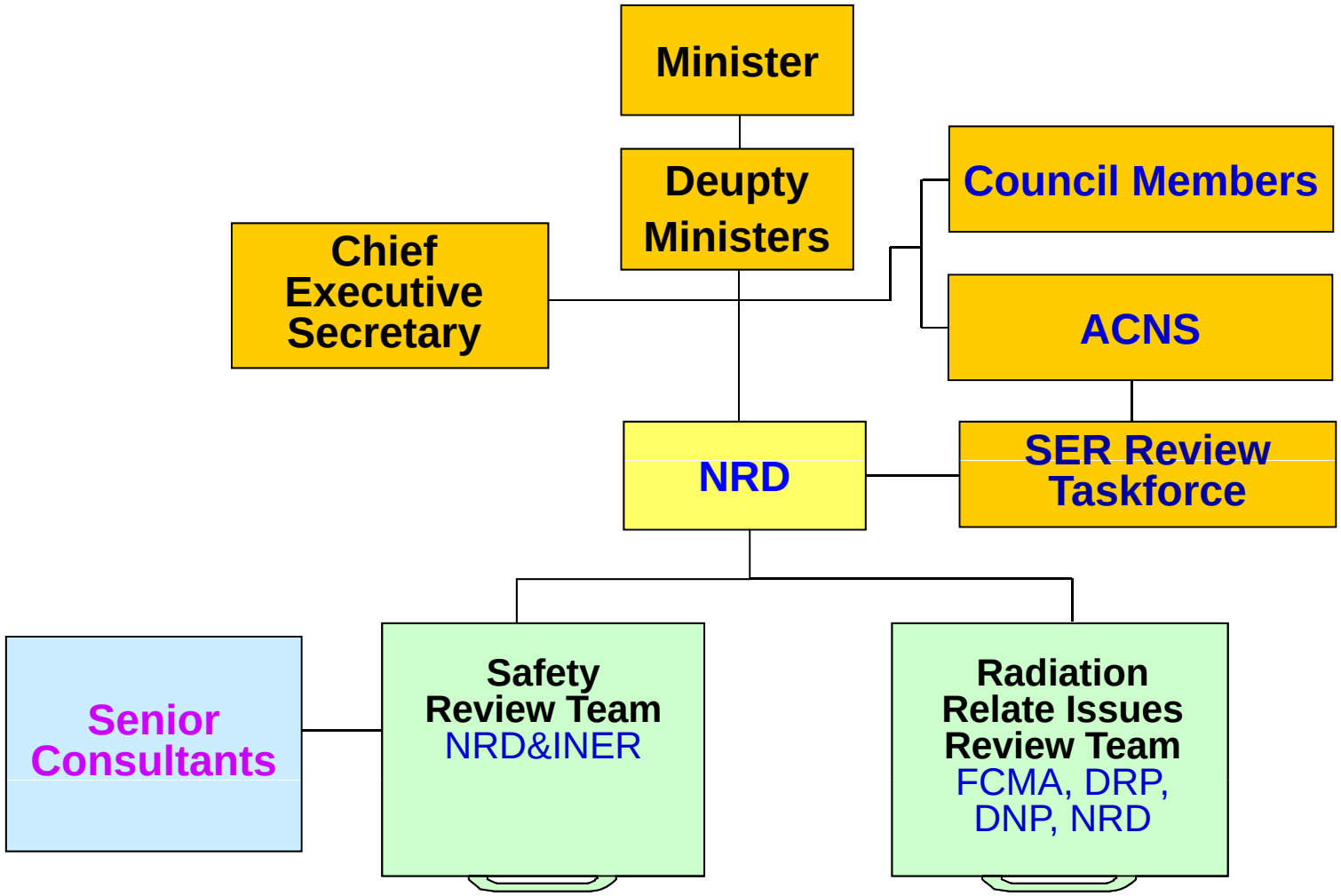
- **According to Regulation on the Review and Approval of Application for Operating License of Nuclear Reactor Facility Article 16**
  - LR application should be submitted within 5~15yrs before expiration of the current license.
  - Application should include:
    - General information
    - Technical information
    - Technical Specification Changes
    - Others required by the competent authority

Taiwan License Renewal Review Process



Taiwan License Renewal Review Process

Administrative Organization



Taiwan License Renewal Review Process

Nuclear Reactor Facilities Regulation Act
***Article 5&6/* Regulation on the Review and Approval of application for Operating License of Nuclear Reactor Facility**

- General Information
- Technical Information
- Technical Specifications
- Radiation Related Issues

Technical Information

- Integrated Plant Assessment
- CLB changes during NRC review of application
- Evaluation of TLAAs
- FSAR Supplement

Integrated Plant Assessment

- Identify structures and components subject to aging management review
- Describe and justify methods used
- Demonstrate aging effects will be adequately managed

CLB changes during NRC review of application

- SCs that perform intended function without moving parts or change in configuration or properties
- SCs that are not subject to replacement based on quantified life or specified time period

Evaluation of TLAAs

- Provide a list of TLAAs and demonstration
- Provide a list and an evaluation of plant specific exemptions granted pursuant to 10CFR 50.12

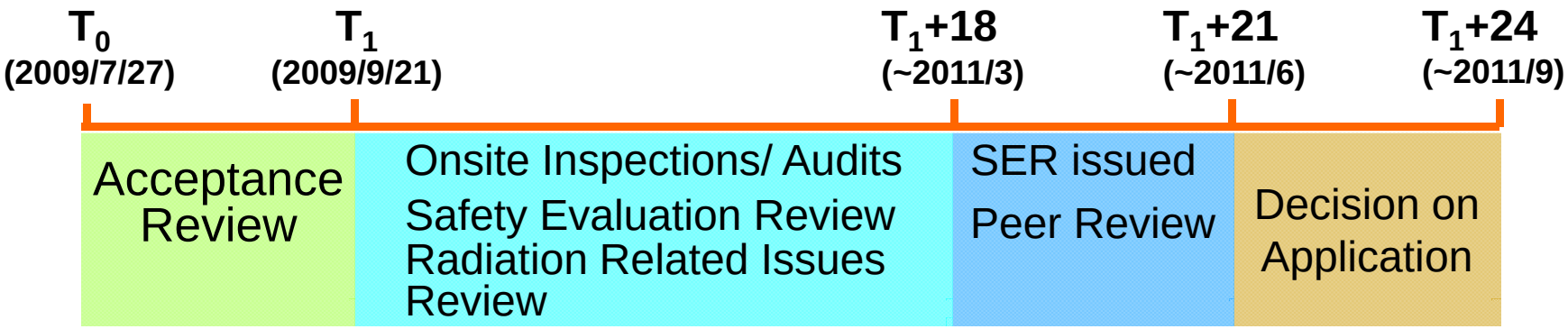
FSAR Supplement

- The analyses remain valid for the parlod of extended operation
- The analyses have been projected to the end of the extended operation
- The effects of aging on intended functions will be adequately managed for the period of extended operation

Mainly follow US process except environmental information.

Taiwan License Renewal Review Process

- Schedule of review



- References
  - 10CFR54, 10CFR50, NUREG 1800, NUREG 1801 (GALL Report), RG 1.188, LR ISG, NEI 95-10, LRA &SER of US plants, NUREG 1437, etc.
  - IP71002, IP71003, NRD-IG-55

Current Status of CS LR Review

- Safety Review
  - conducted 2 on-site audits on Scoping & Screening, AMP/AMR/TLAA.
  - conducted 1 on-site inspection on unit 1 structure &component condition at inaccessible area during refueling outage.
  - issued 1st & 2nd RAIs (total 327 RAIs)
- Radiation Related Issues Review
  - Held 2 meetings with TPC

Current Status of CS LR Review

- Major findings
  - QA
    - No stringent QA implementation guidance document
    - No walkdown procedure and appropriate/traceable record for S&S process
    - Poor document change control process and scoping P&IDs not up-to-date
  - Plant condition & operating experience
    - Data collected up to 2007 only
    - Some DCRs should be considered but not included in LRA document

Current Status of CS LR Review

- Structure Monitoring Program
  - Inadequate acceptance criteria in current monitoring procedure
  - Some crack found in intake structure & torus area during site audit were not recorded.
  - Noticeable water seepage in the RHR pump corner room
- Metal fatigue analysis
  - FW piping and RHR return line need reanalysis per NUREG 6260
  - Adjust 5 design transient cycles to maintain the component CUF below 1.0
- EQ
  - Poor EQDP control
  - Data incomplete (MCC…..)

Current Status of CS LR Review

- **To enhance the transparency of LR review, information is put on AEC's website and periodically updated:**
  - Background
  - Rule & Regulation for LRA
  - Review Process
  - Status of License Renewal Applications
  - FAQs
  - Others

Issues of concern

- **Corrosion of the Mark I drywell shell-Oyster Creek experience**
- **Inaccesible medium-voltage cables**
- **Buried piping management**
- **Degradation of neutron-absorbing materials in the spent fuel pool**

Issues of concern

- **Corrosion of the Mark I Drywell Shell-Oyster Creek experience**
  - Have conducted inspection on both units of Chinshan NPP
  - No evidence of degradation found
  - Implement periodic inspection

Issues of concern

- **Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements**
  - Medium voltage (2kV to 35 kV)
  - Have conducted inspections on 3 NPPs in Taiwan.
  - Some cables found submerged in slash in cable trench
  - Have taken corrective actions to prevent the existence of water
  - Need to enhance test criteria such as power factor, partial discharge, or polarization index.

Issues of concern

- **Buried Piping Management**
  - GALL AMP XI.M28 for surveillance and M34 for inspection
  - CS NPP takes exceptions on surveillance frequency, i.e. shorten the period for oil pipe to half year and lengthen the period for sea water pipe according operating experience.
  - CS experienced underground fuel pipe leakage event in Nov. 1996. Corrective actions were implemented. In 2005, inspection result shown the corrective actions are effective.

Issues of concern

- Consider Vermont Yankee piping issue, buried piping management will be further enhanced together with groundwater –tritium issue.
- Currently Taipower is requested to follow EPRI 1016099 “Groundwater Protection Guidelines for Nuclear Power Plants” and NEI 07-07 Industry Ground Water Protection Initiative to establish groundwater protection program.
- Attention will be continuously given to further development on the issue such as EPRI’s report on buried piping management by third quarter 2010.

Issues of concern

- **Degradation Of Neutron-Absorbing Materials In The Spent Fuel Pool**
  - Beaver Valley and Susquehanna experience
  - CS completed the 2nd time spent fuel pool re-racking in 2000. Boral is used as neutron-absorbing materials.
  - Currently 8 boral test coupons have been examined. Two latest coupons showed blisters near the edge of the coupons. TPC claims that is due to inappropriate examine process and is not due to degradation. Further clarification is needed.

Concluding Remarks

- It is important for licensee to identify plant specific issues for LR and to follow up issues of concern.
- Quality assurance of the whole project including documentation is crucial.
- AMPs are the key issues for successful extended operation. Experience pass-down will be crucial in the next ten years due to the aging of CS NPP employee.
- Taipower plans to submit SPU for CS NPP. The schedule of CS LR will be suspended similar to Susquehanna NPP.
- Public comments on CLB issues such as seismic and dry storage capability might have impact on the final approval schedule of license renewal.

Thank You for Your Attention