

Overview of Recent Regulatory Activities in Taiwan

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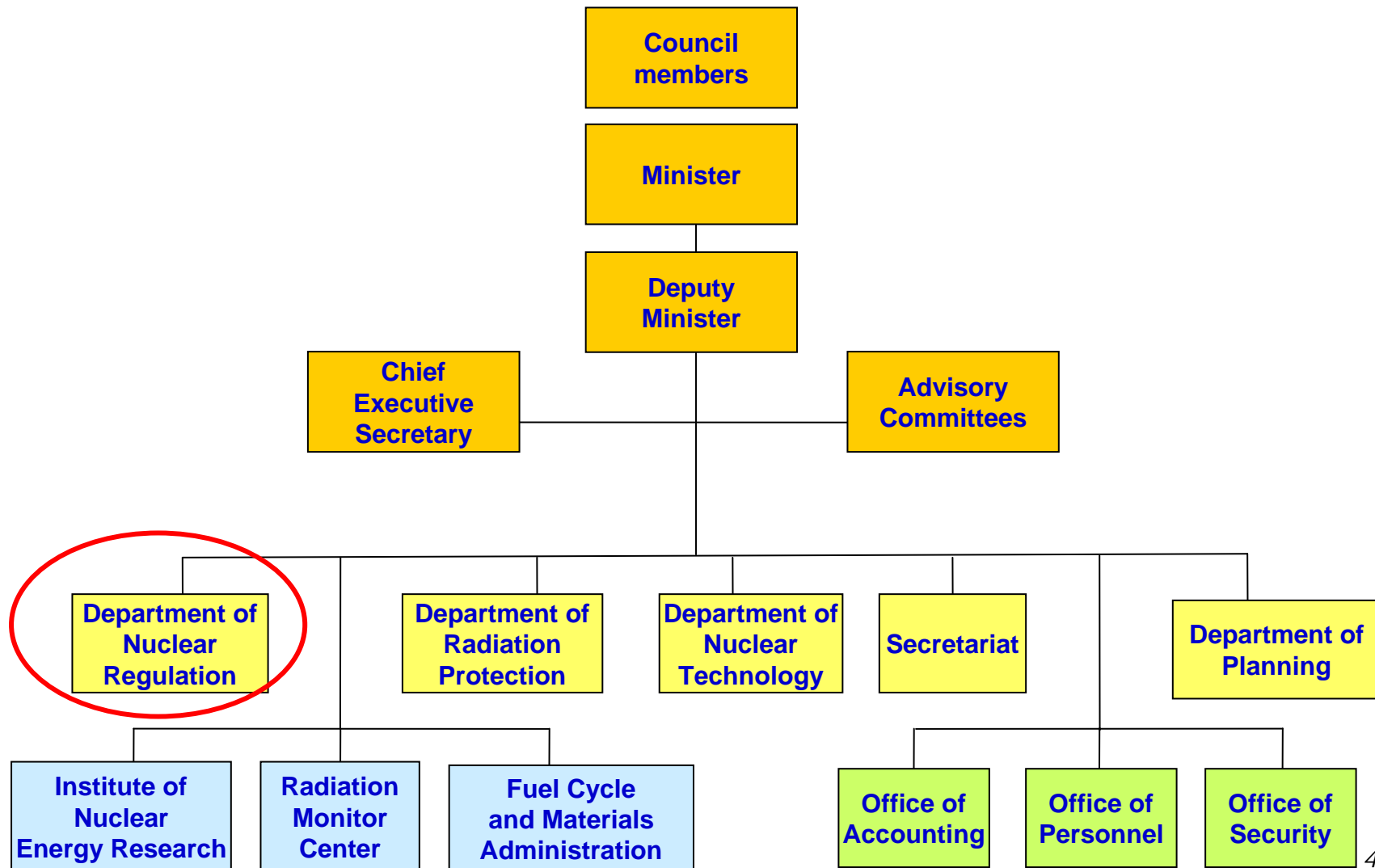
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Organization of Nuclear Safety Regulation

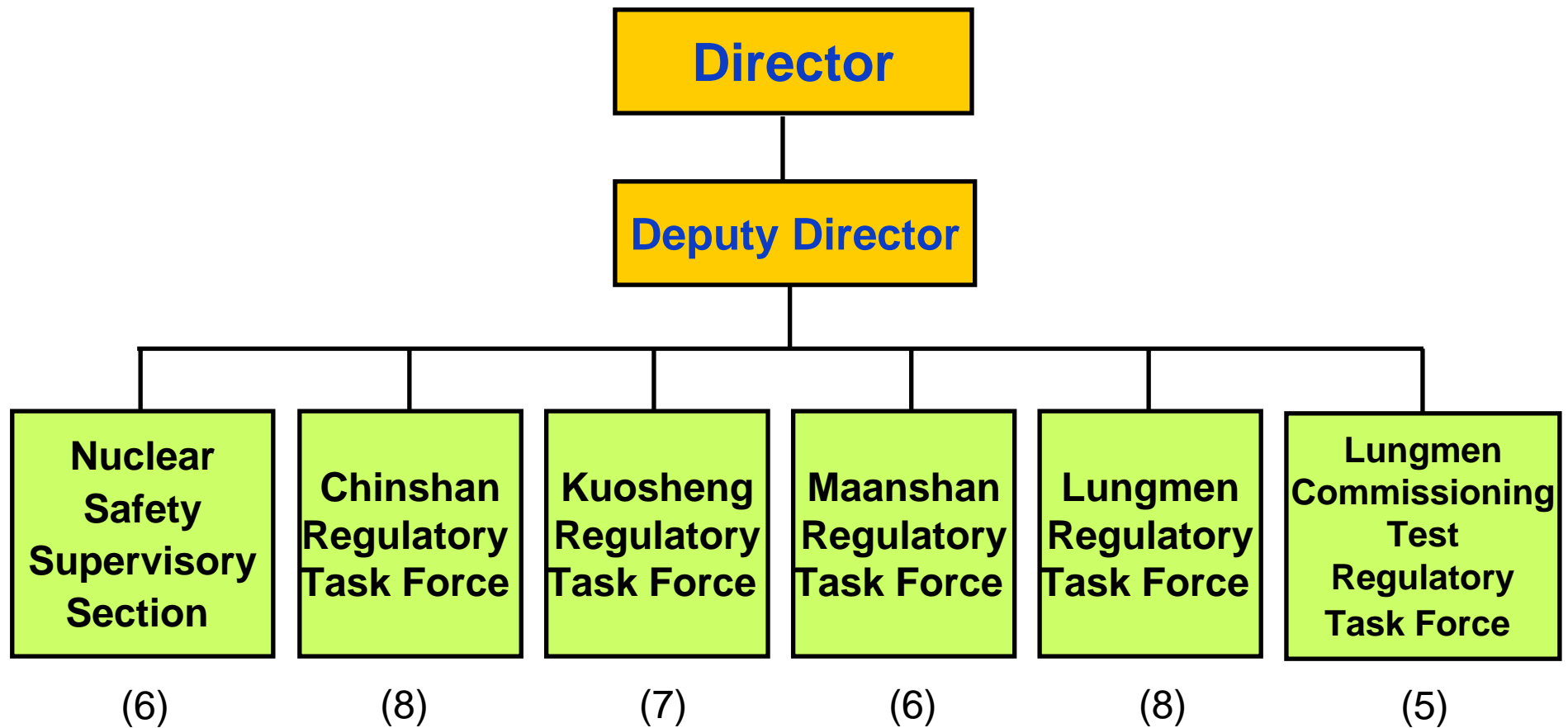
Organization of Nuclear Safety Regulation





Organization of Nuclear Safety Regulation

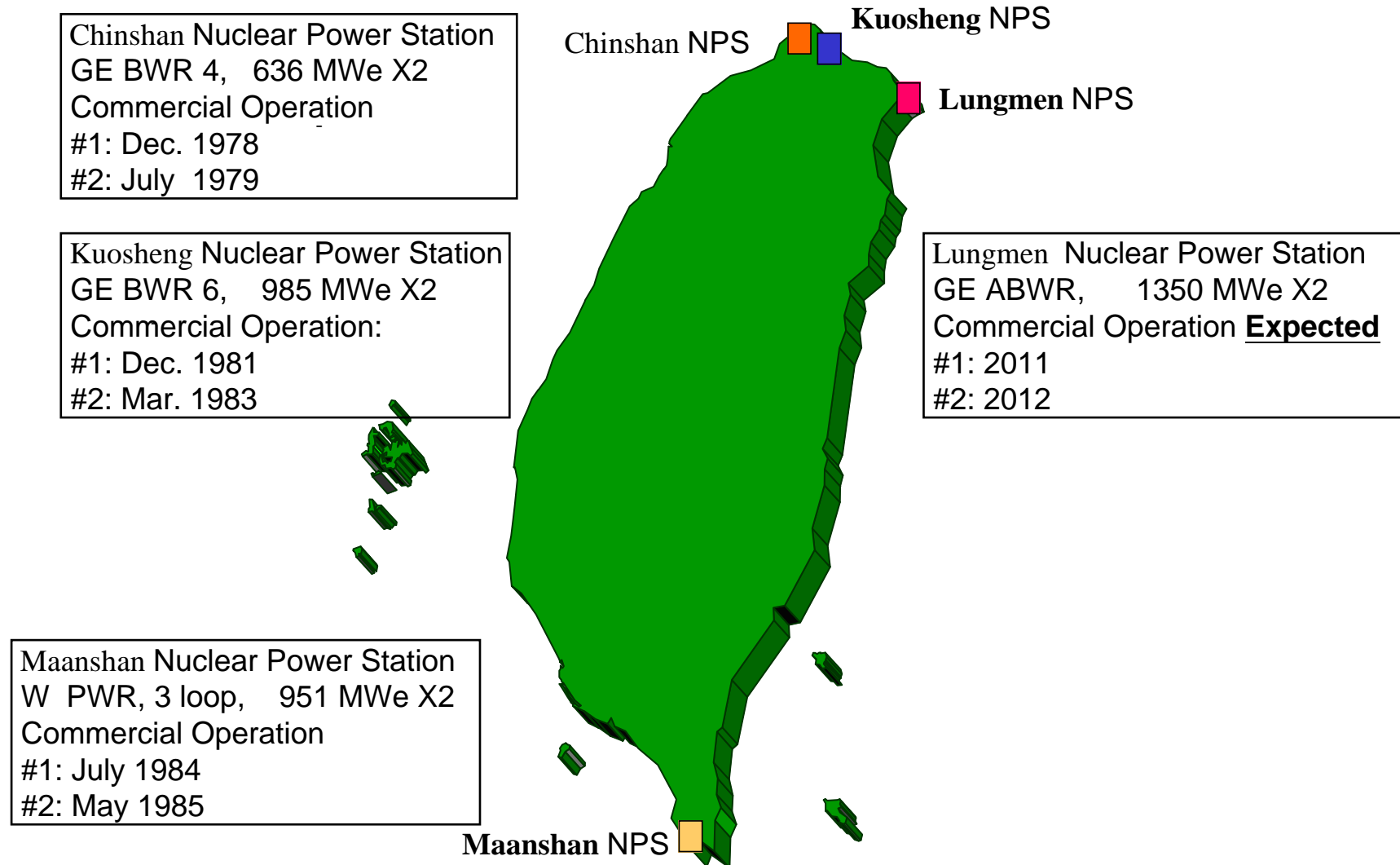
Organization Chart of DNR









Operating Nuclear Power Plants Performance Record

Operating Nuclear Power Plants Performance Record



Locations and Design Features of NPPs in Taiwan

Operating Nuclear Power Plants Performance Record

Real-Time Nuclear Power Plant Operational Status						
2009/04/15 09:54:18						
 Plant & Units	 Chinshan		 Kuosheng		 Maanshan	
	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2
Reactor Status	Operating	Operating	Operating	Operating	Operating	Operating
Reactor Power (%)	100	100	88	100	99	99
Generator Output (MWe)	645	654	915	973	941	958

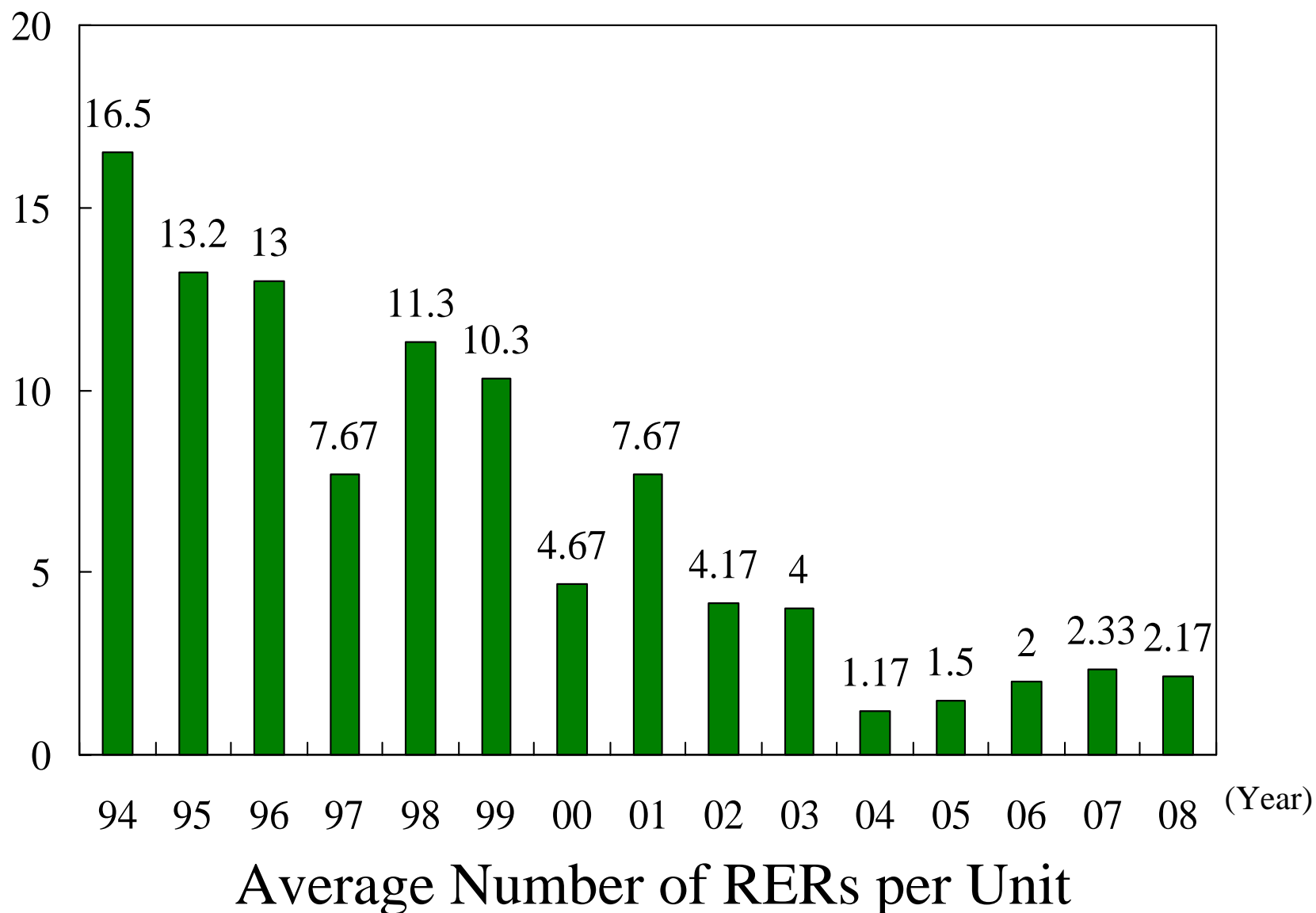
Reactor Status Display :
 [Green] : Operating, [White] : Refueling Outage, shutdown, [Gray] : Computer Maintenance, Computer down, Communication Fault, and Connected to Simulator for drill.

Reactor Power and Generator Output Display :
 [Green] : Reactor Power within 100%, [White] : Reactor Power between 101%~102%, [Yellow] : Reactor Power above 102%

Display is changing automatically every 5 seconds; decimals will round off for the numbers.

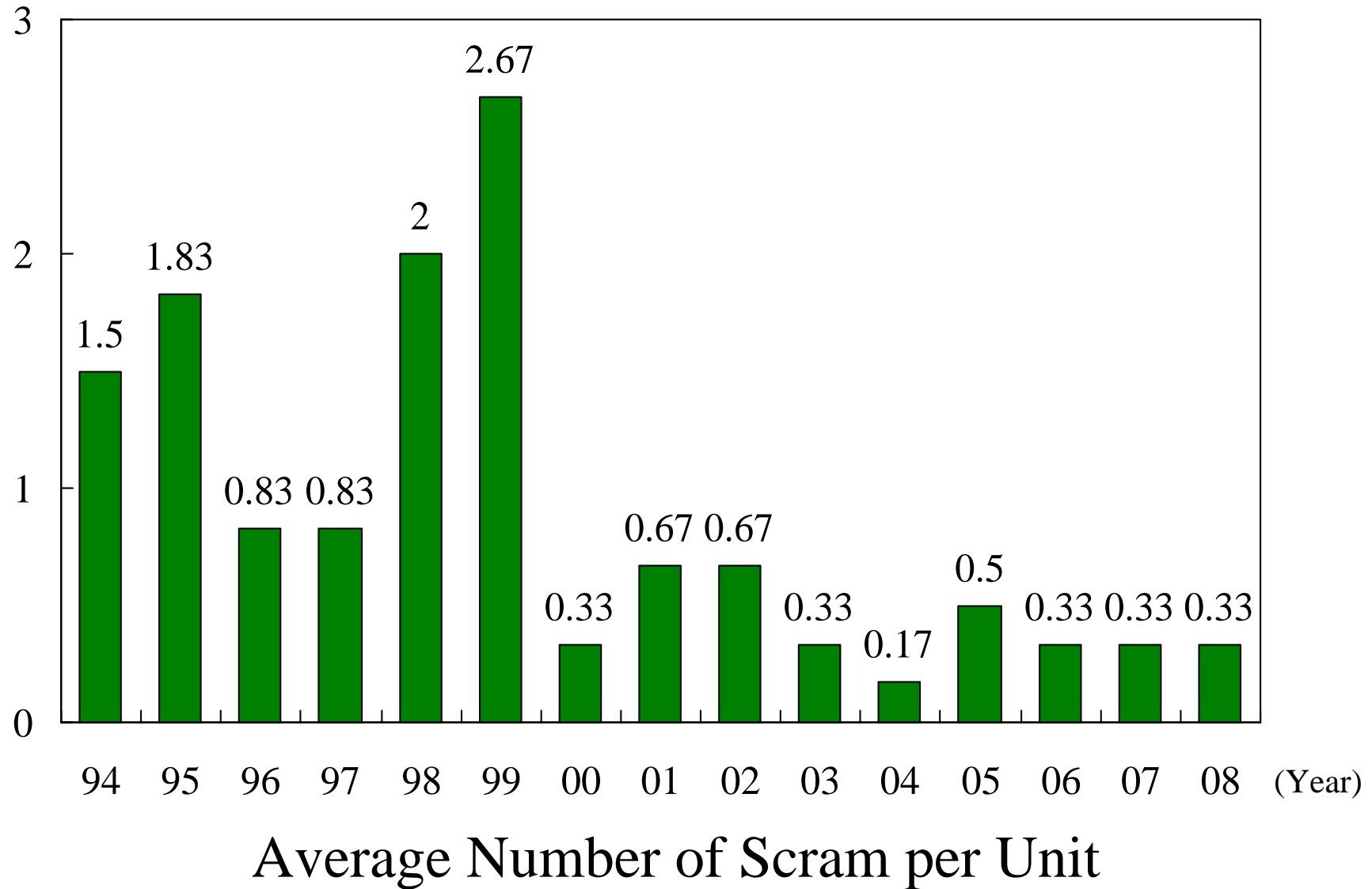
http://gamma.aec.gov.tw/spds/plantdata_e.asp

Operating Nuclear Power Plants Performance Record



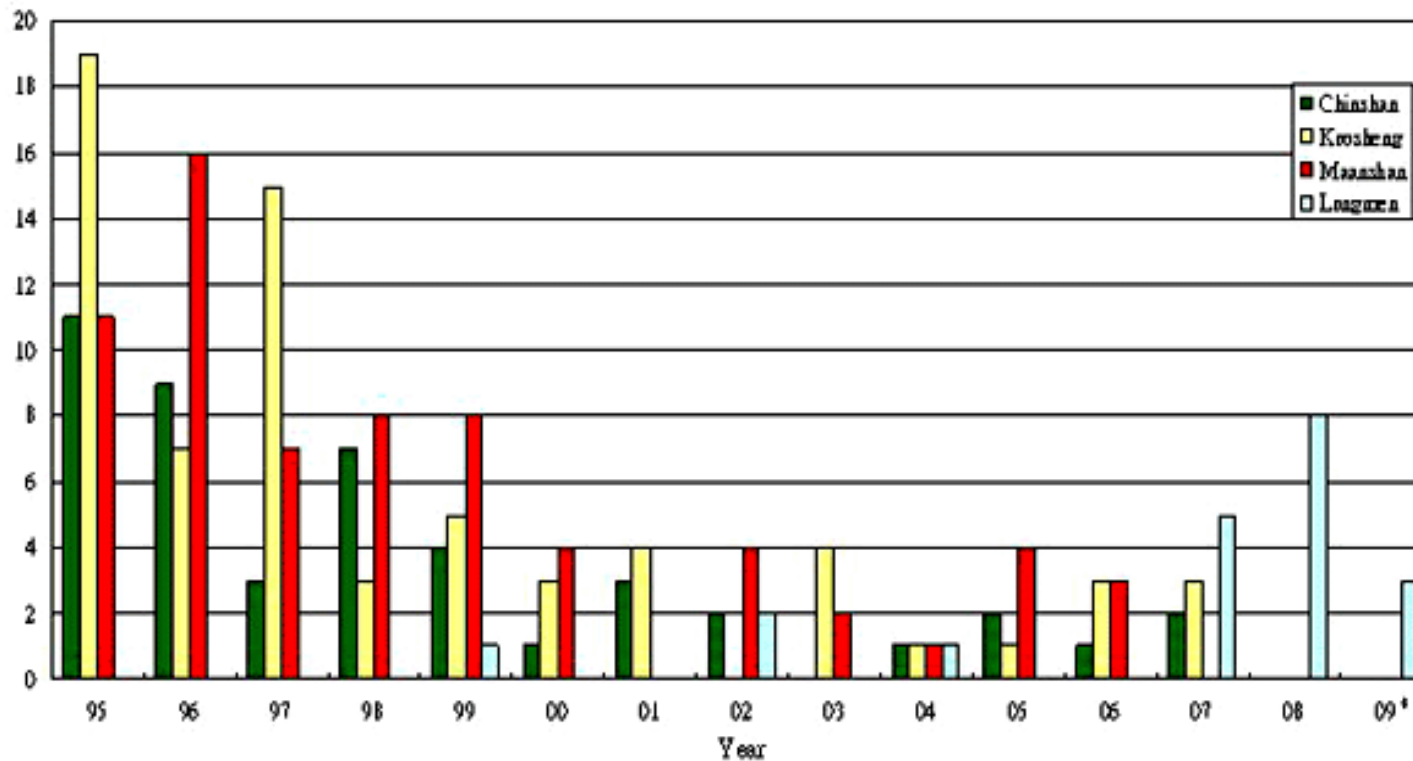


Operating Nuclear Power Plants Performance Record





Number of Violation for each plant



Number of Violation for Each Plant (*: Data up to the end of Mar. 2009)

Recent Regulatory Activities

- Power Uprate of Operating NPPs
- Reactor Oversight Process/Significance Determination Process
- Transient Analysis Methodology Licensing Applications
- Chinshan Unit 1 10-year Integrated Safety Assessment
- Maintenance Rule Implementation
- Preparation for the License Renewal Applications of Operating NPPs
- Lungmen ABWR Construction Inspection

Power Uprate of Operating NPPs

- Taipower has launched a power uprate project for its three nuclear power plants. The power uprate considered is the Measurement Uncertainty Recapture (MUR) type.

NO.	PLANT	%UPRATE	MWt	DATE APPROVED	TYPE
1	Kuosheng 2	1.70** (0.30)*	49** (09)*	2007.06.28	MUR
2	Kuosheng 1	1.69** (1.50)*	49** (43)*	2007.11.23	MUR
3	Chinshan 2	1.66** (0.91)*	30** (16)*	2008.07.03	MUR
4	Maanshan 2	1.69** (1.15)*	47** (32)*	2008.11.28	MUR
5	Chinshan 1	1.66** (0.93)*	30** (17)*	2009.02.23	MUR
6	Maanshan 1	1.69**	47**	2009.05	MUR

* means actual uprate ; ** means tentative

Reactor Oversight Process/Significance Determination Process

- AEC has posted the performance indicators (PI) of Nuclear Power Plants on the website since 2004 and Significance Determination Process (SDP) evaluation results of inspection findings on website since 2006.
- Inspectors conduct characterization and initial screening of findings. Risk significance estimation and justification use the "PRA Model Based Risk Significance Evaluation Tool" (PRiSE) developed by INER.
- Currently both Performance Indicators and Inspection Findings are all green color which means no safety concerns.

Homepage of PRiSE

帳號及密碼輸入【核三廠】

行政院原子能委員會
ATOMIC ENERGY COUNCIL

核三廠風險顯著性評估工具



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Announcement in AEC website









































































- **Announce the light and inspection report in AEC website each season.**
- **There are Two Indicators in AEC website :**
 - § Performance Indicators (PI).
 - § Inspection Performance (IP).
- **AEC website**
<http://www.aec.gov.tw/www/control/index-04.php>





Color of Performance Indicators

指 標		機 組		核一廠		核二廠		核三廠	
				1	2	1	2	1	2
肇 始 事 件	臨界7000小時非計劃性反應爐急停（自動或手動）								
	非計劃性反應爐急停且喪失正常熱移除								
	臨界7000小時非計劃性功率變動> 20% 額定功率								
救 援 系 統	高壓冷卻水系統（HPCI / HPCS）不可用率								
	反應爐爐心隔離冷卻水系統（RCIC）不可用率或輔助飼水系統（AFW）不可用率（核三廠）								
	餘熱移除系統（RHR）不可用率								
	緊要柴油機（EDG）不可用率								
	安全系統功能失效								
屏 障 完 整	反應爐冷卻水系統比活度								
	反應爐冷卻水系統洩漏率								

註1:  : 無安全顧慮  : 低微安全顧慮  : 中度安全顧慮  : 顯著安全顧慮

Color of Inspection Findings

視察指標		核一廠		核二廠		核三廠	
		1	2	1	2	1	2
肇始事件	96年第四季						
	96年第三季						
	96年第二季						
	96年第一季						
救援系統	96年第四季						
	96年第三季						
	96年第二季						
	96年第一季						
屏障完整	96年第四季						
	96年第三季						
	96年第二季						
	96年第一季						

註1:  : 無安全顧慮  : 低微安全顧慮  : 中度安全顧慮  : 顯著安全顧慮

Transient Analysis Methodology

Licensing Applications

- Transient Analysis has always been performed for Taipower by the fuel vendors.
- In order to develop their own safety analysis capability, Taipower submits a series topical reports of TITRAM (TPC/INER Transient Analysis Methods) for licensing review.
- Totally 38 reports, 11 have been approved (2006-2008) and implemented in the MUR applications, 3 is under reviewing, others will be reviewed in the following years.(2012)

Chinshan Unit 1 10-year Integrated Safety Assessment

- According to Nuclear Reactor Facilities Regulation Act Article 9 “After nuclear reactor facilities have been formally operated, one integrated safety assessment at least shall be implemented every ten years and then be submitted to the competent authorities for review and approval. “
- Taipower submitted the third ten-year integrated safety assessment of Chinshan unit 1 in June 2008. Up to now, the report is under reviewing.



Maintenance Rule Implementation

- To monitor the effectiveness of maintenance activities to minimize the likelihood of failures and events.
- The working items of scoping, initiating evaluation, guideline and procedures, database have been completed by Taipower.
- MR on test-run for one year in 2007 and implementation starting from Jan. 2008
- AEC has performed a first-time MR inspection for all NPPs in the 4th quarter of 2008. The inspection report is available on the AEC website.



Preparation for the License Renewal Applications of Operating NPPs

- According to “Regulation on the Review and Approval of Applications for Operating License of Nuclear Reactor Facilities”, timeliness of application is from 5 to 15 years before the expiration of the operating license.
- The operating license of the 1st (Chinshan) NPP in Taiwan has been issued for over 30 years. So it is the appropriate time to raise License Renewal issues.

Preparation for the License Renewal Applications of Operating NPPs(cont'd)

- The detailed LR guidance will generally reference related U.S. Regulatory Guidance.
- Taipower LR Planning
 - Apply sequentially to Chinshan, Kuosheng , and Maanshan
 - Taipower organized LR task force in July 2005
 - 3 Years for each NPP
 - completed in 2007 for Chinshan
 - To be completed in 2010 for Kuosheng
 - To be completed in 2013 for Maanshan
- AEC will also organize a review task force in the near future.



Lungmen ABWR Construction Inspection

- The total accumulated completion of Lungmen project approach 87.59 % by March 2009
- In addition to the routine inspection activities, AEC also conduct some task forces on special area for this year, including:
 - FSAR review
 - Welding of safety related piping inspection
 - Piping flushing and PCT inspection
 - Initial test program & turnover process inspection
 - Pre-operation test inspection of pre-requisite systems

Bird-view of Lungmen Plant



Important Upcoming Activities

- License renewal application
- Continue TITRAM licensing application for 3 plants
- Weld overlay on dissimilar metal welds of Maanshan pressurizer nozzles
- Continue Improvement of our inspection procedures
- Upgrade of PRiSE to include shutdown safety and external events
- Continue FSAR review and conduct taskforce inspections related to pre-op and startup tests for Lungmen NPS.

Concluding Remarks

- The overall safety performance of nuclear power plants in Taiwan is continuously maintained at a high level of standards
- The goal of the reactor regulation is not only to assure the safety of the NPPs in order to protect the public health and environment but also to maintain the stable/reliable operation.
- Continue our effort to be more **effective, efficient, consistent, open and transparent** in regulatory activities.



Thank You for Your Attention