

Peer Review of National Report Group 3

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1. Legal and Regulatory Framework

China	Single Independent RB since 1984 - National Nuclear Safety Administration responsible for safety regulation both for NPPs and RRs.
Greece	Independent RB, under the Ministry of Development which reports to the Prime Minister
Philippines	RB is not independent under the current laws, RA 5207 and RA 2067, but have internal regulatory control program for PNRI facilities A proposed law to create an independent RB is currently pending at the Philippine Senate
Ukraine	RB is independent, State Nuclear Regulatory Committee of Ukraine (SNRCU), since the early 1990s Available normative basis is sufficient for decision of today tasks for both NPPs and RRs.

2. Basics of Decommissioning

China	<p>Draft Decommissioning Plan is ongoing, based on IAEA standards. Draft DP has been reviewed by IAEA experts and recommendations are currently being implemented.</p> <p>Quantitative criteria for the different stages of decommissioning to be developed.</p>
Greece	<p>Primary Cooling System Decommissioning Plan is in progress, based on IAEA documentation.</p> <p>Clearance and related radiation protection issues are still based on operational limits established previously</p>
Philippines	<p>Decommissioning Plan is in progress based on IAEA documentation. Initially, the Management Plan covering some parts of the Decommissioning Plan has been developed and submitted to the RB.</p> <p>The IAEA Dose and Clearance Values have been adopted thru PNRI Administrative Order</p>
Ukraine	<p>RR WWRM will be in operation at least till 2018.</p> <p>Preliminary DP was approved by RB in 2009, ongoing decommissioning planning. Revision to be done after 5 years</p>

3. Transition from Operation to Decommissioning

China	<p>Domestic project proposal for transition phase was approved in 2008</p> <p>Related projects on waste conditioning are ongoing at CIAE. Reactor cooling and defueling ,and drainage of coolant have been completed.</p> <p>Teams for Technology Management, Quality Assurance and Planning and Contracting have been established.</p>
Greece	<p>Reactor was shut-down in 2004 for renovation.</p> <p>As soon as funding was secured a PCS renovation project was initiated with the assistance of design experts from the IAEA. Project still in progress.</p>
Philippines	<p>PNRI will be responsible for the entire decommissioning project. However, external assistance will be contracted out. Work packages are yet to be developed.</p> <p>Focus on the preservation of the R.R bldg & its facilities to maintain structural integrity, e.g. building envelope and the repair of mechanical and electrical system while decommissioning is on going.</p>
Ukraine	<p>The stages of termination of operation and final closure are foreseen by PDP in 2009. The implementation of stages will be in accordance with the relevant sub-programs.</p>

4. Characterization

China	<p>Preliminary characterization survey plan for the HWRR of CIEA was completed in 2010.</p> <p>To determine activity inventory, a review of existing information including calculation and sampling, e.g. core drilling, smear sampling, and reactor internals sampling are ongoing and envisioned to be completed by EO 2010</p>
Greece	<p>Survey of the old PCS including sampling and characterization is on going as part of the Decommissioning Plan.</p> <p>Completion of characterization of the PCS is foreseen to be completed by the end of 2010.</p>
Philippines	<p>Completed work plans in terms of characterization hazard thru field survey, sampling and laboratory analysis. Equipment is available and written procedures for each activity have been established.</p> <p>RB provided the authorization and work is now in progress.</p> <p>As of 2010, characterization survey is still on going.</p>
Ukraine	<p>The Complex engineering and radiation inspection (CERI) Program was developed and is in progress now.</p> <p>The CERI report will be presented to the regulator early next year to consider updates, modifications and revisions, as appropriate.</p>

5. Cost estimates

China	<p>HWRR transition phase project from 2009-2011 with budget of 3.5M US dollars was approved in September 2008.</p> <p>HWRR decommissioning has been included in governmental plans for the period of 2006-2010 and 20-year long-term plan. Total cost of decommissioning project is about \$35-M, including inflation has been established.</p>
Greece	<p>Preliminary cost estimates of the decommissioning project will be done after the completion of the characterization survey. However, there has been an estimate made on the removal of the PCS.</p>
Philippines	<p>Based on experience of other countries, a preliminary estimate of about \$2-M, with a large variability was established. A better estimate will be made as part of the decommissioning plan.</p>
Ukraine	<p>Partial estimates are available, e.g. dismantling of primary circuit, heat exchangers and reactor vessel.</p> <p>The complete cost estimates will be presented for final DP.</p>

6. Decommissioning Technologies

China	<p>No experience in actual decommissioning process but looking at experience with similar reactors, e.g. Belgium. Bilateral agreement with Belgium on the D&D of RR.</p> <p>Characterization equipment option study has been made. Some remote equipment are expected to be applied to dismantle the reactor core.</p>
Greece	<p>Some experience in dismantling technologies is available & remote controlled equipment is under conceptual design, e.g. remote control piping cutter. The design will be used if the projected dose is too high.</p>
Philippines	<p>Equipment have been acquired for activities concerning characterization survey.</p> <p>No experience in actual decommissioning activities but expert advice on decontamination and dismantling techniques such as the use of diamond wire cutting equipment, Brokk machine and the scabblers machine, have been obtained through the IAEA.</p>
Ukraine	<p>Some experience of dismantling works is available, e.g. for dismantling and removal of heat exchangers and primary circuit pipe.</p> <p>Foreign experience for similar type of reactor vessel as one piece has been evaluated and is expected to be applied.</p>

Summary

COUNTRY	1	2	3	4	5	6
China	Y	In progress	Y	In progress	Y	Under study
Greece	Y	-do-	In progress	-do-	N	Y
Philippines	N	-do-	-do-	-do-	N	Under study
Ukraine	Y	-do-	-do-	-do-	Y	Y

Legend

1. Legal & Reg. Framework
2. Basics of Decommissioning
3. Transition Phase
4. Characterization
5. Cost Estimates
6. Decommissioning Technologies

Remarks

- Countries are at different stages of planning & implementation. Except for Ukraine, China, Greece and the Philippines need further assistance in the development and implementation of its Decommissioning Project (technologies, technical capability for both operators/regulators)
- Availability of Funding still remains to be a major issue in the timely implementation of decommissioning activities
- The perception that the Decommissioning Project is a priority among decision makers will greatly support the achievement of the goals and objectives of the project in a timely manner
- Finally, most research reactors in the R2D2 participating countries have more or less similar design. The exchange of information and experience within the R2D2 project is a valuable tool and should be continued.
- IAEA Training on Decommissioning has permitted some countries to form dedicated project work groups for decommissioning resulting to a more systematic and effective implementation of the decommissioning project.