Knowledge Management (KM) Risk Assessment of Critical Knowledge Loss in an Organization with Expanding Nuclear Power Program

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OUTLINE OF PRESENTATION

• PAEC and its Expanding Nuclear Power Program

• Risk and Knowledge Loss Risk Assessment

• Magnitude of Knowledge Loss Risk Challenge for PAEC

• KM Risk Mitigation Strategies Adopted by PAEC

• Questions
PAEC -- Quick Facts

- PAEC is the largest S&T organization in Pakistan
- PAEC manages portfolio of Nuclear Energy applications for national development and growth
- PAEC owns & operates the following NPPs in Pakistan

<table>
<thead>
<tr>
<th>Location</th>
<th>Status</th>
<th>Setup Name</th>
<th>Type</th>
<th>MWe</th>
<th>Approved Manpower</th>
<th>Commercial Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karachi</td>
<td>Operational</td>
<td>K-1</td>
<td>PHWR</td>
<td>137</td>
<td>1530</td>
<td>1972</td>
</tr>
<tr>
<td>Chashma</td>
<td>Operational</td>
<td>C-1</td>
<td>PWR</td>
<td>325</td>
<td>832</td>
<td>2000</td>
</tr>
<tr>
<td>Chashma</td>
<td>Operational</td>
<td>C-2</td>
<td>PWR</td>
<td>340</td>
<td>741</td>
<td>2011</td>
</tr>
<tr>
<td>Chashma</td>
<td>Under Construction</td>
<td>C-3</td>
<td>PWR</td>
<td>340</td>
<td>_</td>
<td>2016</td>
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<tr>
<td>Chashma</td>
<td>Under Construction</td>
<td>C-4</td>
<td>PWR</td>
<td>340</td>
<td>_</td>
<td>2017</td>
</tr>
</tbody>
</table>

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Pakistan’s Nuclear Power Vision 2050

- K-1 C-1&C-2 (Existing)
- C-3/C-4 2016/17
- Addition during 2021-30
- 2030 Target
- 2050 Vision

- 3.4% of Currently Installed Capacity
- 740 MW
- 680 MW
- 7,380 MW
- 8,800 MW
- 42,000 MW
RISK and KM Risk Assessment of Critical Knowledge Loss

• Risk is defined in the Project Management Body of Knowledge (PMBOK, 2004) as an event or unclear situation that will influence the timing, cost and quality of a project.

• This study considers attrition due to retirements of its workforce -- A risk for the organization as it has implications of loss of knowledge for the organization and thereby on its quality and output.

• This study assesses the magnitude of the anticipated Risk of Knowledge Loss in three Operational NPPs namely CNPGS (C-1 & C-2) and K-1 based on the factor of Time until Retirement.
Age Wise Distribution of Manpower in CNPGS (C-1, C-2) & K-1
# Workforce Attrition Challenge

## Cumulative Retirements over 8 years in CNPGS (C-1, C-2) & K-1

<table>
<thead>
<tr>
<th>NPP Name</th>
<th>Present Strength</th>
<th>Approved Strength</th>
<th>Ave. Age in (yrs)</th>
<th>%age Attrition over 8 Years</th>
<th>Magnitude of Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-1</td>
<td>1529</td>
<td>1530</td>
<td>43</td>
<td>23</td>
<td>High</td>
</tr>
<tr>
<td>C-1</td>
<td>820</td>
<td>832</td>
<td>38</td>
<td>07</td>
<td>Low-Med</td>
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<tr>
<td>C-2</td>
<td>545</td>
<td>741</td>
<td>33</td>
<td>04</td>
<td>Low</td>
</tr>
</tbody>
</table>

![Bar Chart showing cumulative retirements over 8 years in CNPGS (C-1, C-2) & K-1](chart.jpg)
K-1: Case of High Attrition Challenge

Potential Cumulative Retirements
K-1, 23 % Cum. Rate

Fraction of Total Staff
Eligible to retire

PAEC’s Strategy for Managing Critical Knowledge Loss

• Workforce planning
  • *What are our needs and when to fill?*
• Adapting TVA’s Tool to Identify the Positions / persons holding Critical Knowledge
• Mitigate Knowledge Loss by Capturing and transferring the knowledge
  • Documenting and Codification
  • Education & Training
  • Coaching and Mentoring
  • Extending the Contract of Experts
  • Phased retirement plans
QUESTIONS?

THANK YOU!