Current Status and Future Challenges in Korean Nuclear HRD

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In 2024, NPP Total: 34 Units.
Planned NPPs will depend on energy mix policy in the future.
Outlook of Nuclear Human Resource in South Korea

Forecasted power generation by sources

Source: 5th Basic Plan for Electricity Supply and Demand, 2011
Outlook of Nuclear HR in the world (1)

Review background for prospect of nuclear power

Using 2012 IAEA prospect

Applying the 0.85-0.9 of operational capacity to additional units required

Assuming 4 units as low development and 8 units as high development, on permanent closing of aged nuclear power plant per year

- 10~20 units getting older than 30 years of its lifespan per year
- Trend to extend the lifespan of expired nuclear power plant for more than 20 years in most of nations including US
- One-third of lifespan-expired nuclear power plant facilities closing down permanently
Outlook of Nuclear HR in the World (2)

Operating NPP (Units)

Required HR (Persons)

- **High**
- **Low**

Operating NPP

- 620 (2015)
- 500 (2020)
- 560 (2025)
- 829 (2030)

Required HR

- 331,580 (2015)
- 234,430 (2020)
- 311,580 (2025)
- 217,660 (2030)
HRD is the main element of the 19 infrastructures for successful implementation of NPP Project.
Korean Government Policy for Nuclear HRD

- Enlargement of fellowship program for students
- Providing intern job opportunities at research institutes and industries
- Support for updating curricula, linkage with the advance technology
- Establish and support the Specialized Nuclear School

Support for Nuclear education program

- Providing fringe benefits for radiation workers
- Enhancement of training organizations and its training program
- Activation of exchange program among industries, research institutes and universities

Maintaining qualified Nuclear Manpower on Industry

- Providing international career for young researchers and students
- Fostering joint research projects with international organizations & advanced countries
- Utilization of outstanding experts from overseas

Encouraging Global Competitiveness of Nuclear Manpower
Current HRD Program in Korea

Total HR on Nuclear Industry: 23,835

- Undergraduate degree: 50.7%
- High school Diploma: 18.3%
- College degree: 13.1%
- Nuclear Fuel: 11.9%
- Design & Eng.: 13.6%
- Operation: 12.5%
- Support & Management: 7.7%
- Research: 6.5%
- Etcetera: 7.7%

<table>
<thead>
<tr>
<th>Degree</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Undergraduate</td>
<td>50.7%</td>
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<tr>
<td>High school</td>
<td>18.3%</td>
</tr>
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(Source: 16th Investigation of Nuclear Industry, 2012)
Professionalism

Requirements for Successful HRD

Professional Leaders required

Maintain the Current Nuclear Industry

Current HR in Nuclear Industry

Increased NPP Demand for 3E

Innovative NPP Technology

Enhanced Safety Requirements of NPP

Increased Requirement of Human Performance

“Professionalism”

“Diversity”
Department store-style enumerative education
Insufficient educational synergy
Adaptation period needed

Issues of Current Nuclear HRD

- Shortage of Nuclear HRs
- Aged experts
- Needs for Higher qualified technology
- Disparity between research and industry
- Brain drain abroad
- Take a long period Of time
- HR demand according to increased regulation for safety
Set-Forth for Future HRD program

Nuclear Industry ➔ Technology Integrated
☞ Connecting Government ↔ Nuclear industry ↔ Energy
Diplomacy for Educational Governance System

- Developing the Systematic Road Map for HRD in the medium and long term
- Industry-Oriented HRD
- Educating and training for Global leader of Nuclear Energy
- Knowledge and Tech. Transfer from aged experts
- HRD for International Cooperation

“A Need to Nurture Leadership-Level Professionals”

“Academia”

“Industry”
New Challenge...KINGS

NPP Technology Forerunner

Nurturing Global Nuclear Power Leadership for Global Environmental Preservation

Creative
- Emphasize Systems Thinking
- Foster Practical NPP Leader

Focused
- Cover only Nuclear Plants Engineering
- Recruit Students World-wide

Practical
- Locate Center of Nuclear Plants
- Solve Actual Problems

Lead NPP Technology Advancement

Nurture Leadership-level Practical NPP Professionals

Share NPP Technology

Hands-on experience
- a team of 5-7 students with 2 professors, Blend Theory & Field Experience

Learning by Doing & Thinking
- Systems Engineering Mind-set

Cooperative Spirit
- Project Based Learning
- Customized projects Defined roles of team members, Professors act as facilitators
KINGS learning develops through stages

**1st Year**
- **1st trimester**: 12 weeks
- **2nd trimester**: 12 weeks
- **3rd trimester**: 12 weeks

**2nd Year**
- **4th - 6th trimester**: 12 weeks

**PERIOD**
- **Winter Session**: Globalization, Leadership program
- **NPP Technical Track**
- **NPP Management Track**
- **Industry-Academy Joint Project-Based Specialization Program**

**Know-What**
- NSE: Nuclear Systems Engineering
- SE Fundamental
- SE Intermediate
- SE Intensive

**Know-How**
- ENGG FUNDAMENTALS
- NPP FAMILIARIZATION COURSE
- NPP INTENSIVE COURSE

**Know-Why**
- NPP Technical Track
- NPP Management Track

**Thesis**
- INDIVIDUAL THESIS

**Winter Session**
- Globalization
- Leadership program

*NSE : Nuclear Systems Engineering
KINGS' Operational Principles

Students from 17 countries are studying at KINGS.

VNPERC: Virginia Nuclear Power Research Consortium
GMU: George Mason University
SJSU: San Jose State University
Thank you for your attention