The Status of Radiation Protection and its Prospect in KHNP

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- I. Introduction
- **II.** Dose Reduction Plan
- **III.** Reliability of Radiation Data
- IV. Current R&D Topics for RP
- **V. Future Prospect**

Introduction



- **■** Nuclear Power Plant in Korea
 - 24 in operation (21,716MW)
 - 4 in construction (commercial oper. : 2016 ShinKori 3&4, 2018 ShinHanul 1&2)
 - 4 in construction (commercial oper. : after 2021~)
 - * 22.5% of nation's total power
- The voice of stakeholders are increasing
- KHNP continues to make every effort for radiation safety including to reduce radiation dose

Dose Reduction Plan



	Phase-1 Plan ('91~'00)	Phase-2 Plan ('01~'10)	Phase-3 Plan ('07~'16)
Main Reduction Methods	-Removal of RTD bypass lines -Application of new ECT equipment -Adoption of new nozzle dams -Improvement of RCS pump shafts	-Installation of T ³ removal facilities -Adoption of chemical decontamination -Initiation of ALARA workshops	-Steam generator replacement -Zinc injection -Ultrasonic fuel rod cleaning -Simplification of Rx heads
Goal / Result of Final yr (man·Sv)	1.2 / 0.95	0.78 / 0.60	0.43 / 0.53(2013)

Reliability of Radiation Data



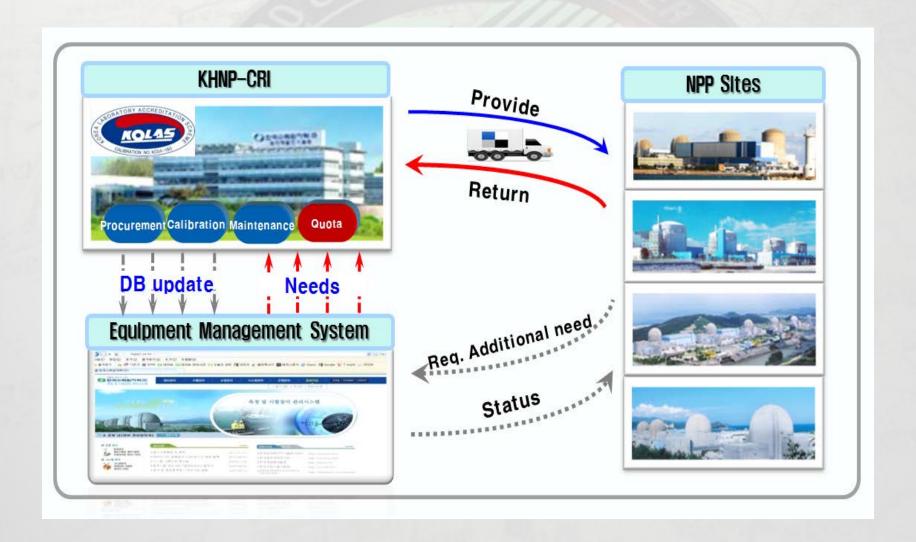
- One of the important thing in RP management is to secure the reliability of radiation survey data
 - Before 2010, calibration of portable radiation instrument were done at each plant
 - CRI centralized it on the basis of KOLAS*/ILAC**
 - Over 8,500 items are calibrated annually in CRI

 *Korea Laboratory Accreditation Scheme **International Laboratory Accreditation Cooperation
- **■** Inter-comparison for right dose assessment
 - External dose : by NSSC's Nuclear Act Article 80
 - Internal dose : by ANSI N 13.30
 - * 13 NPPs participated to this program

III.

Reliability of Radiation Data





Current R&D Topics for RP (1)



- Development of an ALARA type radiation monitoring system ('11.4~'13.8)
- Research on countermeasures to reduce the radiation dose for long-term operated nuclear power plant ('12.3~'14.2)
- Development of auto calibration and data management system for radiation measurement ('13.4~'15.3)
- Development of clearance monitor system for radwaste ('13.9~'16.6)
- A study on the simple and easy radiation supplementary units for effective communications with public ('14.7~'14.10)

Current R&D Topics for RP (2)

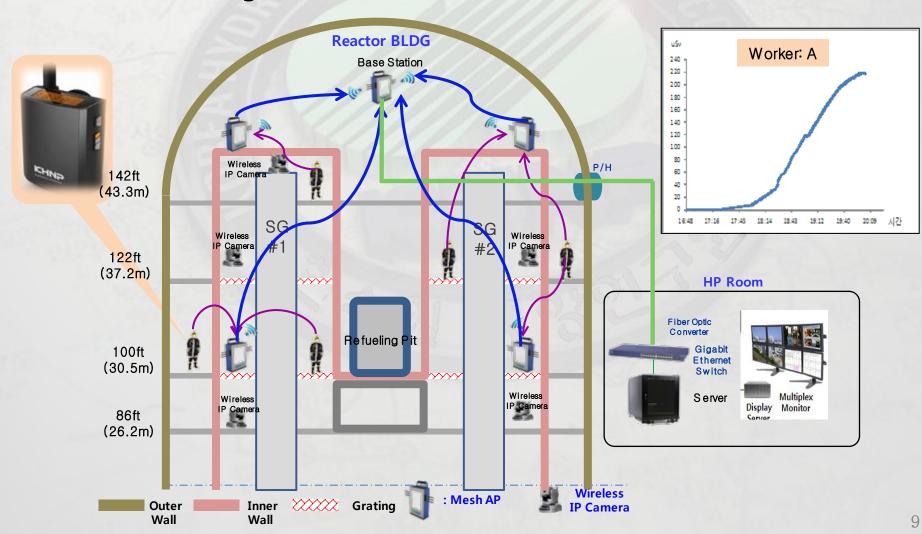


- Construction of standard radiation field and process improvement for tests of personal dosimeters('15.3~'18.2)
- **■** Evaluation of expected annual tritium activity from Hanul units 3 & 4 ('15.3~'15.12)
- Reliability test of steam generator leak monitoring system for standard Korean nuclear plant ('15.7~'15.11)
- Feasibility study on the development of the shape-related radioactivity evaluation technology ('15.9~'16.5)
- Development of calibration technology of portable tritium monitor (TBD)

Current R&D Topics for RP (3)



Schematic diagram of RPDMS



IV.

Current R&D Topics for RP (4)



■ CRI's Gamma(Cs-137), Neutron(Cf-252) Irradiator







Current R&D Topics for RP (5)



■ CRI's Radwaste Clearance Monitor System

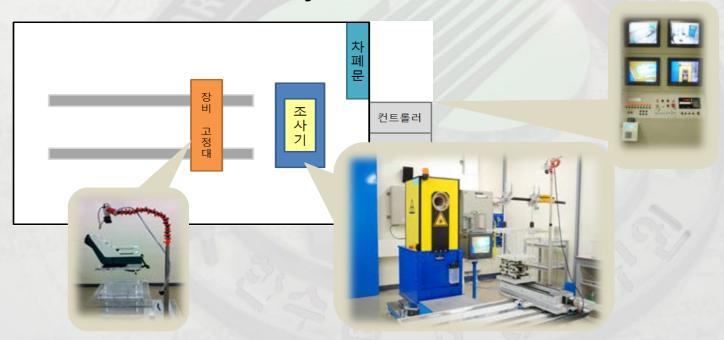


IV.

Current R&D Topics for RP (6)



■ CRI's OCR Calibration System



조사기 검증기	교정기리 (mm) 기준신	913511316	지시값					=3.00						
		기준선량뜓	1	2	3	4	5	6	7	8	9	10	단위	
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		3 476.0	50 mSv/h	til	\$1.2	t _{1.2.}	ξQ	42.0		5/.4	£/,2	41.4	5/.2	nSu
185 GBq		1 788.9	5 mSv/m	501	502	5.04	5,02	5.06	5.11	5.01	5.04	+16	5.11	alu
중중:	중준위	1 486.4	500 #Soh	499	492	441	496	499	491	493	492	494		asy
11.1 GBq		4 645.7	50 xSwh	30.1	5.02	70.4	50. E	50.1	50.2	50.6	5/./	5/.2	5/10	do
		1 035.3	측정전	1.81	183	1,92	1.99	192	1.99	1.84	1.86	1.94	119	45.1
BKG		4 645.7	측정후	6.14	0.17	232	123	0.19	020	0.21	0.11	0.19	aA	45



Current R&D Topics for RP (7)

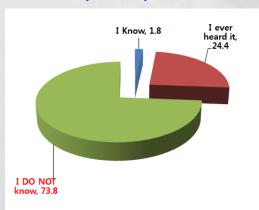


A public opinion census for radiation unit

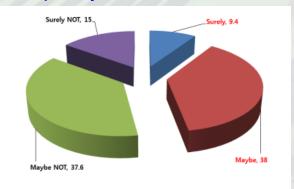
• Recent Survey of Public Opinion "Radiation Unit - mSv. Ba"

Population	500 Men and women over the age of 19			
Sampling Error	Based on the random sampling, Confidence interval of 95% standard maximum allowable sampling error are ± 4.4% point			
Survey method	Computer Aided Telephone Interview (CATI)			
Survey period	Oct. 22 ~ Oct. 23, 2014			
Institution	Hankook Research Co., Ltd.			

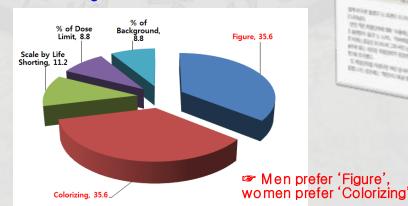
Do you know the radiation unit 'Becquerel(Bq)'? (%)



Do you think the radioactivity is infected with person's respiratory or skin contact? (%)



Which do you prefer as easier radiation auxiliary unit, if it is changed?



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Future Prospect



- **■** Concurrent radiation issues;
 - Claiming of resident's thyroid cancer in Kori
 - Tritium bioassay of resident in Wolsung
- Future prospects
 - Preparation of radiation protection for decommissioning
 - Paradigm shift of ALARA culture and micro-Sivert (including tritium reduction)
 - Application of up-to-date ITs to radiation protection management
 - Maintaining the measurement/calibration authority of plants