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# 한국원자력학회 창립 50주년 기념 학술대회

KOREAN NUCLEAR SOCIETY

2019. 5. 22.(수)~24.(금)  
제주 국제컨벤션센터



*KNS 50<sup>th</sup>  
Anniversary*



사단법인 한국원자력학회  
KOREAN NUCLEAR SOCIETY

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# 한국원자력학회 창립 50주년 기념 학술대회

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2019. 5. 22.(수)~24.(금)  
제주 국제컨벤션센터



사단  
법인 한국원자력학회  
KOREAN NUCLEAR SOCIETY



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[ 한국원자력학회 특별회원 광고 ]

## 학회장 인사말



김명현 학회장

존경하는 한국원자력학회 선후배, 동료 회원 여러분 안녕하십니까? 우리 학회는 1969년 3월 8일에 창립총회를 가졌다고 합니다. 50년전 초대 회장님이신 최형섭 박사님이 당시 어떤 말씀을 하셨는지 궁금해 집니다. 1962년부터 1966년까지 한국원자력연구소 소장을 역임하시고, 1966년부터 한국과학기술연구소 소장으로 계시던 시점이니, 바야흐로 과학기술의 진흥을 우선적으로 추진하시면서, 선진국의 원자력 기술을 배우고, 자리 잡는데 역점을 두셨을 것으로 짐작됩니다. 오늘 이 자리에 계시다면, 후배들이 이루어 놓은 기적들을 보며 놀라실 것이며 하실 말씀을 잃어버리실 것 같습니다. 그렇습니다. 우리는 그동안 Best Follower이었습니다. 영원히 이루기 힘들 것 같았던 일들을 이루었습니다. 우리 독자 설계의 상용로 APR-1400을 UAE에, 연구로인 JRTR은 요르단에 수출하였고, 우리 학회지 NET는 국제적으로 우수한 등급의 학회지로 자리 잡았습니다. 2019년 지금 지나간 50년을 돌아보며 새로운 50년을 꿈꾸는 자리에 서게 된 것을 영광으로 생각하면서, 또한 막중한 책임감을 느끼고 있습니다.

진취적인 목표 설정을 놓고 산 · 학 · 연이 서로 으르렁대며 싸울 수 있는 열정이 남아 있다면 좋겠습니다. 지금은 어떻게 살아남을지를 좌고우면하며 숨죽이고 있는 처지인 것 같습니다. 가슴 속의 열정을 누르고 주저 앉은 학생들과 동료들을 볼 때, 이렇게 외치고 싶습니다. “확신과 소신을 잃지 마시고, 진인사대천명(盡人事待天命) 합시다.” 라고 ...

정부의 에너지전환정책은 그 방향이 원론적으로 옳다고 해도, 당장 받아들이기 힘든 것임은 분명합니다. 애써 기초를 다진 에너지 자립의 주축인 원자력을 빼고, 하늘만 쳐다보아야만 하는 재생에너지의 확대가 우리나라에서는 불가능한 것임을 국민들도 이해하고 있습니다. 지금은 국민들을 설득하는 홍보보다도 각자의 위치에서 아닌 것은 아니라고 말하는 용기가 필요합니다. 다행스럽게도 우리 학회의 도덕성과 전문성은 인정받고 있습니다. 우리 학회가 구심점이 되어, 정책 입안자들의 마음을 돌려 놓는데 힘을 합쳐야 합니다. 회원 여러분의 보다 적극적인 동참을 기대합니다. 미세먼지, 에너지 수급 안정성, 저소득층을 배려하는 전력 복지, 일자리 창출, 저탄소 성장 등 어느 것 하나도 원자력없이 불가능합니다. 국민들 앞에서 당당하고, 소위 환경단체 들 앞에서 당당해야 합니다.

우리나라 원자력이 기술선도국의 자리를 얻은 이상, First Mover가 되기를 소망하며, 각자 자신의 분야에서 긍정적인 미래를 확신합니다. 아직 할 일이 너무나 많습니다. 우리와의 경쟁 국가들은 제4세대 원전과 SMR에 투자를 아끼지 않으며, 새로운 연구로 건설도 활발히 진행하고 있습니다. 높아진 규제 장벽을 뚫기 보다 앞장 서서 뛰어 넘는 의지가 필요합니다. 막힌 길을 뚫기 보다 돌아가는 길을 찾는 지혜가 필요합니다. 우리가 갖고 있는 고준위 폐기물은 족쇄가 아니라, 우리의 기술을 입증할 새로운 기회가 될 수 있습니다.

조만간 제2, 제3의 원전 수출이 가능함을 확신합니다. 일부 선진국들의 사례를 보면, 수출 시장 개척을 위해 인력 양성 지원, 연구로 건설 지원, 인프라 구축 지원 등을 통해 전방위적으로 노력을 하는 것을 봅니다. 원전 수출은 한두 기관의 노력만으로 되는 것이 아님을 회원들도 잘 아실 것입니다. 이제 우리 주변에서 세계적인 역량을 갖고 계신 분들을 많이 봅니다. 우리 모두가 눈을 세계로 돌려 넓은 세계 시장에서 많은 성과들을 얻으시기를 소망합니다.

선배들의 탁월한 결정들로 오늘의 안녕과 번영이 있었습니다. 지금 우리들의 결정은 그 어느 때보다 냉철하고 지혜로워야 합니다. 대안없이 반대만 하다가, 이제는 신재생을 붙잡고 터무니 없이 원자력을 반대하는 집단의 논리가 옳지 않음을 확신하신다면, 주저하지 말아야 합니다. 무엇이 우리에게 필요한 미래인지 힘을 합쳐 설계해야 합니다.

여느 해에도 늘 그랬던 것처럼, 오늘 우리는 자신이 연구하고 있는 원자력 기술 분야의 진보를 위해 학회장에 참석해 있습니다. 묵묵히 자신의 일에 최선을 다하시는 회원님들 덕분에 우리가 발전할 수 있었던 것도 맞습니다. 하지만 원자력 60년, 학회 창립 50주년, 원전 수출 10주년의 시점에서 과거 어느 때보다도, 서로 “격려와 단합”이 절실한 때입니다. 기술교류 뿐만 아니라 우리나라 원자력의 미래도 한번쯤 다같이 생각해보고 토론해보는 귀중한 기간이 되시기를 바랍니다. 또, 동료들과의 논의 속에서 새로운 연구 주제나 사업 주제를 창출하는 행운도 찾으시기를 기원합니다.

제주도는 돌, 바람, 여자가 많은 삼다도라 했지만, 적어도 이번 주 학회 기간에 제주도는 “원자력 인재”, “좋은 논문”과 “미래에 대한 열정”이 많은 삼다도가 될 것입니다. 매일 보던 부부도 여행을 떠나면 새로운 만남이 됩니다. 인재와 논문과 열정들이 새롭게 만나는 장이 되기를 바랍니다.

2019년 5월

김 명 현 학회장

# 창립 50주년 기념 학술대회 전체행사 일정표

5월 22일(수)										5월 23일(목)										5월 24일(금)												
등록 (09:00 ~ 17:00)										등록 (08:00 ~ 17:30)										등록 (08:00 ~ 17:00)												
09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00	18:00-19:00	09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00	18:00-19:00	09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00				
201A 2F										[4A] 해안로 및 원자력재료 구두발표										[4C] 해안로 및 원자력재료 구두발표												
201B 2F										[4B] 해안로 및 원자력재료 구두발표										[4D] 해안로 및 원자력재료 구두발표												
202A 2F										[7A] 방사선 방호 구두발표										[8B] 방사선 이용 및 기기 구두발표												
202B 2F										[6A] 원자력 안전 구두발표										[6B] 원자력 안전 구두발표												
203 2F										[6D] 원자력 안전 구두발표										[6E] 원자력 안전 구두발표												
삼다홀A 3F										[6C] 원자력 안전 구두발표																						
삼다홀B 3F										[8A] 방사선 이용 및 기기 구두발표																						
한라홀A 3F																																
한라홀B 3F																																
3층 로비																																
300 3F										[3A] 원자력시설해제 및 방사성폐기물관리 구두발표										[3B] 원자력시설해제 및 방사성폐기물관리 구두발표												
301 3F										[2A] 원자력물리 및 계산과학 구두발표										[2C] 원자력물리 및 계산과학 구두발표												
302 3F										[2B] 원자력물리 및 계산과학 구두발표										[2D] 원자력물리 및 계산과학 구두발표												
303A 3F										[5A] 원자력 열수력 구두발표										[5B] 원자력 열수력 구두발표												
303B 3F										[5D] 원자력 열수력 구두발표										[5E] 원자력 열수력 구두발표												
304 3F																																
400 4F										[11A] 원자력정책, 인력 및 협력 구두발표										[11B] 원자력정책, 인력 및 협력 구두발표												
401A 4F										[10A] 원전건설 및 운영기술 구두발표										[9A] 양자공학 및 핵융합기술 구두발표												
401B 4F										[10B] 원전건설 및 운영기술 구두발표										[10C] 원전건설 및 운영기술 구두발표												
402A 4F										[1A] 원자력시스템기술 구두발표										[1B] 원자력시스템기술 구두발표												
402B 4F										[12A] 원자력기술제어, 인간공학 및 자동화기술 구두발표										[12B] 원자력기술제어, 인간공학 및 자동화기술 구두발표												
탈라홀B+C 5F																																
오션뷰 5F																																
이벤트홀 1F																																

\* 창립자부 정기총회 : 5월 22일 (수) 18:00 ~ 20:00

## 학술발표회 회의장 배치도

### 2F

- ① 201 A, B
- ② 202 A, B
- ③ 203



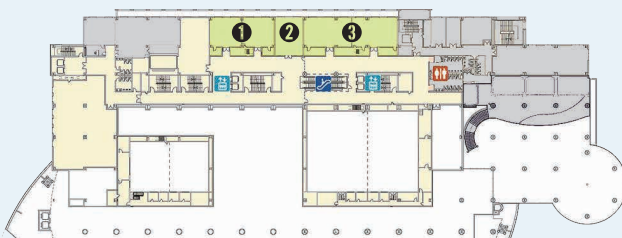
### 3F

- ① 301 A, B      ② 302      ③ 300
- ④ 303 A, B      ⑤ 304      ⑥ 삼다홀 A, B
- ⑦ 한라홀 A, B      ⑧ 델리시아(레스토랑)
- ⑨ 델리뷰



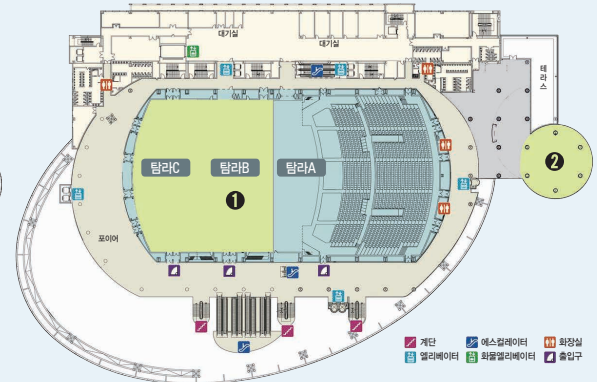
### 4F

- ① 401 A, B
- ② 400
- ③ 402 A, B



### 5F

- ① 탐라홀 A, B, C
- ② 오션뷰





## 한국원자력학회 제31대 임원진

### 회장



김명현

### 수석부회장



민병주

### 부회장



우승웅



이승숙



전휘수



정재준



주형국

### 감사



나기용



진태은

### 총무이사



박문규



이영일

### 사업이사



노재만



임채준

### 재무이사



박석빈



조재선

### 국제협력이사



김신환



임채영

### 기획이사



김군태



김한곤

### 고급정책연구소



조병옥 소장



어근선 부소장

### 학술이사



문주현

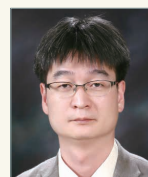


이현철

### 편집이사

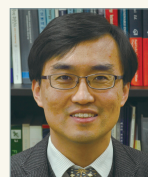


김광표



심형진

### 홍보이사



정용훈



조현갑

### 대학·청년이사



김만철



최성열

### 특임이사



남영미



신창호

## 한국원자력학회 원자력이슈위원회 위원

### 위원장



민병주

### 부위원장



김만웅

### 임명직 위원



김교윤



김신환



김종숙



김지현



김창락



김한곤



김현준



류호진



박문규



윤의성



이숙경



이영옥



이영일



조병옥



한은옥

### 당연직 위원 (연구부회순)



정동욱



김용희



정종태



유종성



김경두



양준언



황원태



이창희



김중원



김윤호



이기복



정연섭

## 한국원자력학회 소통위원회 위원

### [소통위원회]

위원장 겸 대변인



송종순

부위원장 겸 대변인



정용훈

### 위원



이윤실



이재영



이현철



임채영



정범진



정승영



조현갑





## 한국원자력학회 편집위원회 위원

### 위원장



나만균

### 국내 부위원장



구양현



김은희



최기용

### 국외 부위원장



Shinya Nagasaki



Hideo Nakamura



Won Sik Yang

### 국내 위원



김광표



김용균



김용희



김윤재



김원주



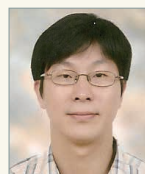
김인규



김창락



문주현



선광민



신형기



심형진



임호곤



정명조



정범진

### 국외 위원



Akio Gofuku



Didier Jacquemain



John C. Jin



Jean Noiroit



Horst-Michael Prasser



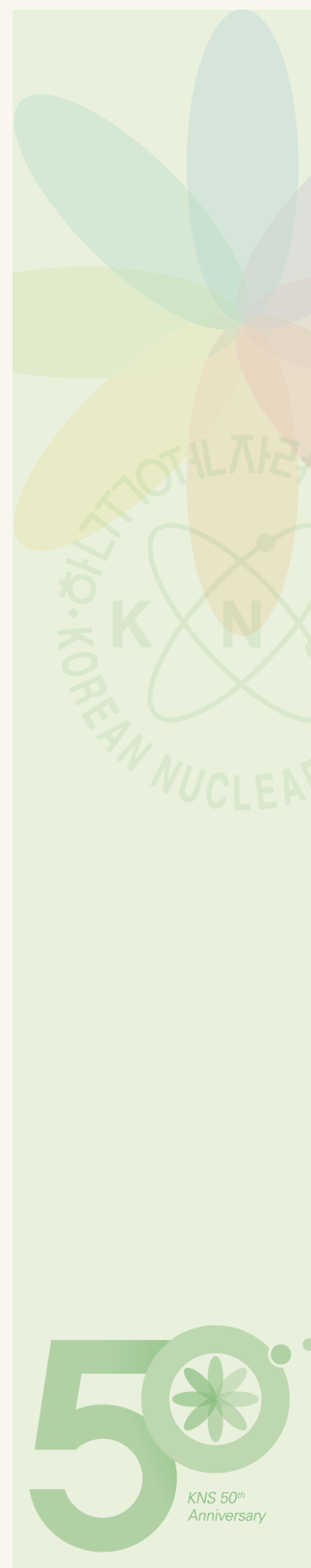
Shripad Revankar



Guanghui Su



Belle R. Upadhyaya





## 한국원자력학회 연구부회장/차기연구부회장 · 지부장

### 연구부회장/차기연구부회장

#### 원자로시스템기술



정동욱



김민환

#### 방사선 방호



황원태



이희석

#### 원자로물리 및 계산과학



김용희



이은기

#### 방사선 이용 및 기기



이창희



김찬형

#### 원자력시설해체 및 방사성폐기물관리



정종태



차완식

#### 양자공학 및 핵융합기술



김종원



이동원

#### 핵연료 및 원자력재료



유종성



장창희

#### 원전건설 및 운영기술



김윤호



이도환

#### 원자력열수력



김경두



권태순

#### 원자력정책, 인력 및 협력



이기복



정범진

#### 원자력 안전



양준언



김군태

#### 원자력계측제어, 인간공학 및 자동원격



정연섭



김창희

### 국내외 지부장



김승평  
광주/전남/전북 지부



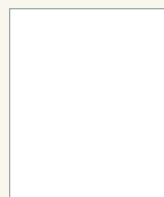
김규태  
대구/경북 지부



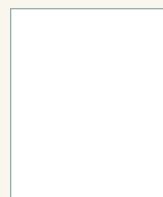
김희령  
부산/울산/경남 지부



이창호  
미국 지부



UAE 지부



IAEA/Europe 지부

### 청년지부



이기만 지부장

### 여성지부



강문자 지부장

### 학생지부



박경태 지부장



박재영 지도교수

## 한국원자력학회 포상 및 장학위원회 위원/사무국

### 위원장



전희수

### 사무총장



남장수

### 위원



김교윤



김지현



김태룡



문주현

### 실장



민현정



배성만



백민



어근선



이나영

### 팀장



송지현



이상덕



이상일



이찬복



이현철

### 대리



이연화



조창석

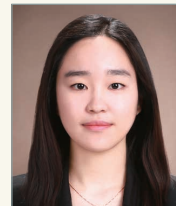


지계광



최성민

### 직원



유진원

## 창립 50주년 기념식 및 특별강연 일정

| 일시 2019년 5월 23일(목) 14:30 ~ 17:10

| 장소 한라홀 (3F)

시간	프로그램
14:30 ~ 15:10	[ 사회 : 박문규 총무이사 ]
	국민의례
	개회사 : 김명현 학회장
	학회 50년 발자취 (Past 50) 영상 상영
	축사 : 과학기술정보통신부 산업통상자원부 일본원자력학회 한국원자력산업회의
	미래비전 선포 : Future 50-KNS 미래를 말하다
휴식 (15:10~15:20)	
15:20 ~ 15:30	<b>시상식</b> -2018 추계학술발표회 우수논문상 -제1회 한국원자력학회 학생 학술대회 우수논문상 -2019 한국원자력학회 장학생, NUCHI 장학생 장학증서 수여
15:30 ~ 16:20	<b>특별강연 I</b> 이병태 (한국과학기술원 경영대학 교수, 경제지식네트워크 대표) 환경과 에너지 정책의 정치와 경제학
16:20 ~ 17:10	<b>특별강연 II</b> Prof. Ryugo Hayano(Emeritus Professor, The University of Tokyo) Radiological consequences of the Fukushima nuclear power accident : myths and facts



## 창립 50주년 축하의 글

과학기술정보통신부



유영민

장관

한국원자력학회 창립 50주년을 진심으로 축하드립니다. 원자력학회는 60년의 우리나라 원자력 역사에서 반세기를 함께하며 대한민국 원자력이 세계수준의 경쟁력을 갖추기까지 발전하는 데에 기여해 왔습니다.

학계 뿐 아니라, 연구계와 산업계의 원자력 전문가들이 모두 모여 교류할 수 있는 공론의 장을 제공함으로써 학술적 진보에 기여하고, 원자력에 대한 올바른 정보를 알리는 데에도 중요한 역할을 해왔습니다. 원자력학회의 지난 50년간의 열정과 노력에 감사를 드립니다.

다가올 50년에 우리나라 원자력은 세계를 향해 한단계 더 도약해야 합니다. 앞으로도 반세기 이상 국내원전을 안전하게 운영하는 한편, 원전 해체기술, 소형원자로 등 차세대 원자력기술을 선도하여 미래에 열릴 새로운 시장을 확보하고 혁신성장에 기여해야 할 것입니다. 이를 위해서는 각계의 전문가가 모이고 소통하여 이루는 학술적 진보가 밑바탕이 되어야 할 것입니다. 한국원자력학회가 앞으로의 반세기에도 학술적 진보를 견인하는 기반으로 역할을 다해 주시기를 부탁드립니다.

다시 한 번 창립 50주년을 진심으로 축하드리며, 앞으로도 한국원자력학회가 우리나라 원자력과 함께 발전해 나가기를 기원합니다.

일본원자력학회



Yasuo Komano

President

Congratulations on the 50th anniversary of establishment of the Korean Nuclear Society. We would like to express our sincere respect for KNS's great contributions to the development of nuclear industry and technology as well as the fostering of human resources under the peaceful uses of nuclear energy for years, since the establishment.

Since the year of 1999 when we have concluded a cooperation agreement, we both have contributed to the peaceful uses of nuclear energy and radiation by promoting mutual technological advancements through various international conferences and technical exchanges for over twenty years.

We hope for further mutual development through the deepening of cooperative relations with KNS.

한국원자력산업회의



정재훈

회장

1959년 우리나라 최초의 연구용원자로 도입을 결정한 이후 우리나라 원자력의 역사는 시작되었습니다. 원전기술의 국산화, 중소형원자로와 신형원자로의 개발, 세계를 놀라게 했던 UAE 원전 수출까지 지난 60년을 경이로운 기록으로 빼곡하게 채워낼 수 있었습니다. 이는 원자력분야 연구개발에 대한 정부의 적극적인 투자와 끊임없는 인적자원의 양성·배출이 있었기에 가능한 결과였다고 생각합니다.

한국원자력학회 창립 50주년을 맞아 지금까지 걸어온 길을 돌아보고, 우리나라 원자력계를 이끌 연구인재들과 함께 미래의 50년, 100년을 그려볼 수 있기를 기원합니다.



## 특별강연 I

| 일시 2019년 5월 23일(목) 15:30 ~ 16:20 | 장소 한라홀 (3F)



**이 병 태**

한국과학기술원  
경영대학 교수

경제지식네트워크 대표

### 환경과 에너지 정책의 정치와 경제학

국가의 에너지 정책이 점차 전문가의 영역이 아니라 정치의 영역으로 진화하고 있다. 문정부들어 탈원전과 에너지 기본계획의 급격한 전환은 다른 나라에서 발생한 에너지와 환경의 정치화의 패턴에 의해 이루어지고 있어서 경각심을 일으키고 있다.

'환경론자들' 또는 '환경정치인'들은 어떻게 이슈를 정치화하면서 전문가의 이성적 의사결정을 봉쇄하고 있는 중이다. 이 강의를 통해 (1) 환경론자들이 이슈의 정치화의 위험성은 무엇이고 (2) 환경론자들의 저탄소 해결책은 기후변화의 해결책이 될 수 없으며, 왜 경제적 논리에 반하는지를 살펴보고 (3) 한국경제의 미래를 위해 이성적 에너지 정책의 중요성을 강조하고자 합니다.

## 특별강연 II

| 일시 2019년 5월 23일(목) 16:20 ~ 17:10 | 장소 한라홀 (3F)



**Ryugo Hayano**

Professor of Physics,  
Emeritus,  
The University of  
Tokyo, Tokyo, Japan

### Radiological consequences of the Fukushima Nuclear Power Accident: myths and facts

In March 2011, immediately after the Fukushima Daiichi Nuclear Power Plant accident, transportation system, communication network and energy infrastructure were all severely disrupted by the earthquake and tsunami, which caused a lot of confusion both at the accident site and within the government. Among other things, the radiation measurements were inadequately carried out. In these eight years, however, a lot of data have been accumulated, such as soil contamination, food contamination, external as well as internal exposure doses of residents, and so on.

On the other hand, the paper published in PNAS (1), for which I am one of the co-authors, estimated the soil contamination level throughout Japan using an atmospheric diffusion model, when there were no wide-area radiation monitoring data, and the "source term" (timeline of radioactivity emission from Fukushima Dai-ichi) was poorly known. As noted above, a large number of actual measurement data have been accumulated in these eight years. The measurements show that the PNAS paper much over-estimated the contamination, particularly at large distances. I am quite embarrassed therefore to hear that some people are still using our PNAS paper to claim that the whole of Japan is significantly contaminated. I would like to urge everybody to use actual data for such discussions.

## 특별강연II

| 일시 2019년 5월 23일(목) 16:20 ~ 17:10 | 장소 한라홀 (3F)

I have been an “antimatter” research team leader at the CERN laboratory in Geneva since 1997. As such, I had no experience in radiological protection nor risk communication. However, after the Fukushima accident, it so happened that my tweets got the attention of many people (the number of followers exceeded 150,000), I started to collaborate with medical doctors in Fukushima to measure internal/external radiation doses of Fukushima residents and to communicate the results to general public. Luckily, all my Fukushima-related activities, including this trip to Korea, have been funded by the donations from my twitter followers.

In the following, let me discuss the results of two papers to which I contributed..

In the first paper (2), we measured the internal radiation doses of approximately 30,000 Fukushima people using whole body counters throughout 2012, and found that the committed effective doses did not exceed 1 mSv. The average dose was less than in early 1960's when the food contamination level was high due to atmospheric A-bomb and H-bomb tests. Our data (and all subsequent measurements) confirm that the radioactive contamination level of food consumed by Fukushima residents is extremely low.

In the second paper (3), co-authored by some 200 people, mostly high school students, the external radiation doses (including natural radiation) of high school students were compared in Fukushima, France, Poland, and in Belarus, using electronic personal dosimeter called the “D-Shuttle”. We found that the external doses of Fukushima high school students were not much higher than those of other parts of the world.

In Fukushima prefecture, as of spring 2019, areas still remain where the evacuation order have not yet been lifted. However, it is worth noting that nearly 2 million people live safely in Fukushima Prefecture. For many, psychosocial and economical issues may be more important than the radiation issues.

Let me close by showing some important numbers, i.e., the number of deaths in Fukushima Prefecture and in Miyagi Prefecture (north of Fukushima). The number of direct deaths (+ missing) due to the earthquake and tsunami: Miyagi-10761, Fukushima-1810. The number of disaster-related death (death during and after the evacuation): Miyagi-928, Fukushima-2268. These show the huge death toll by tsunami (in Miyagi), as well as the difficulties caused by the evacuation (in Fukushima). Of course, no death due to radiation has been reported in these two Prefectures or elsewhere in Japan since the accident.

- 1) T.J. Yasunari et al., “Cesium-137 deposition and contamination of Japanese soils due to the Fukushima nuclear accident”, PNAS 108 19530–19534 (2011); <https://doi.org/10.1073/pnas.1112058108>
- 2) R.S. Hayano et al., “Internal radiocesium contamination of adults and children in Fukushima 7 to 20 months after the Fukushima NPP accident as measured by extensive whole-body-counter surveys”, Proceedings of the Japan Academy, B89, 157–163 (2013); <https://doi.org/10.2183/pjab.89.157>
- 3) N. Adachi et al., “Measurement and comparison of individual external doses of high-school students living in Japan, France, Poland and Belarus—the ‘D-shuttle’ project—”, Journal of Radiological Protection, 36, 49–66 (2016); <http://doi.org/10.1088/0952-4746/36/1/49>

## 만찬 행사 일정

| 일시 2019년 5월 23일(목) 17:30 ~ 19:30

| 장소 탐라홀 B+C (5F)

시간	프로그램
17:30 ~ 19:30	[사회 : 이영일 총무이사]
	해외원자력학회장 창립 50주년 축하영상 상영
	학회 주요업적 회고영상 상영
	학회 창립 50주년 기념 공로상 시상식 (안세희, 윤용구, 이창건, 문석형, 전재풍, 김성년, 김시환, 김태우)
	학회 창립 50주년 기념 축하 케이크 컷팅식
	2019 춘계학술발표회 분과별 우수포스터 상품 증정
	경품 추첨 [경품 협찬 특별회원] 한국원자력연구원, 한국원자력의학원, 한전원자력연료(주)



## 창립 50주년 기념 학술대회 수상자 명단

| 시상식 2019년 5월 23일(목) 17:30

| 장 소 탐라홀 B+C (5F)

### 학회 창립 50주년 기념 공로상

	학회 활동	주요 공적
안세희	 <ul style="list-style-type: none"> <li>·부회장('77.5~'80.11),</li> <li>·6대 보궐 회장 및 7대 회장('80.11~'83.8)</li> </ul>	6년간 학회 부회장, 7대 회장으로 활동하면서, 특히 1981년 학회가 사단법인체로 법적 단체의 지위를 갖도록 함으로서 학회 50년 발전에 기여하였음.
유영규	 <ul style="list-style-type: none"> <li>·학회창립 추진위원</li> <li>·부회장('73.5~'79.4),</li> <li>·감사('79.5~'85.3)</li> <li>·12대 학회장('91.9~'93.8)</li> </ul>	학회창립 추진위원으로 학회 창립, 12년간 임원과 12대 학회장으로 활동함으로서 학회 50년 발전에 기여함.
이창건	 <ul style="list-style-type: none"> <li>·학회창립 추진위원</li> <li>·편집이사('69.3~'71.4)</li> <li>·편집위원('69.3~'71.4, '75.6~'79.5, '83.7~'87.9)</li> <li>·부회장('87.9~'89.3)</li> <li>·11대 학회장('89.9~'91.8)</li> </ul>	한국원자력학회 창립 추진위원, 초대 상임이사(편집이사), 편집위원(10년간), 11대 학회장으로 활동함으로서 학회의 창립과 정착, 특히 학회지 창간 및 발전에 전력을 다하여 학회 50년 발전에 기여하였음.
문선형	 <ul style="list-style-type: none"> <li>·학회창립 추진위원</li> <li>·편집이사('73.5~'79.4)</li> <li>·편집위원('69.3~'83.6, '89.9~'93.9)</li> </ul>	학회창립 추진위원으로 학회 창립, 편집이사 6년, 편집위원 18년 활동을 수행함으로서 학회 50년 발전에 기여함.
전재풍	 <ul style="list-style-type: none"> <li>·재무이사('80.11~'86.3, '93.9~'95.8)</li> <li>·총무이사('87.9~'93.8)</li> <li>·감사('99.9~'01.8)</li> </ul>	16년간 임원(재무이사, 총무이사, 감사)으로 활동하면서 학회재정의 강화 등 학회 50년 발전에 기여함.
김성년	 <ul style="list-style-type: none"> <li>·총무이사('81.5~'84.10, '89.9~'91.8)</li> <li>·사업이사('91.9~'93.8)</li> <li>·15대 회장('97.9~'99.8)</li> </ul>	7년간 임원(총무이사, 사업이사)과 15대 학회장으로 활동함으로서 학회 50년 발전에 기여함.
김시환	 <ul style="list-style-type: none"> <li>·사업이사('95.9~'97.8)</li> <li>·19대 학회장('05.9.1~'07.8.31)</li> </ul>	19대 학회장(2005년 취임)으로서 학회회관 마련을 본격적으로 추진하고, 진행함으로서 2007년 8월 28일 학회의 오랜 숙원이었던 회관마련에 공이 큼으로서 학회 50년 발전에 기여하였음.
김태우	 <ul style="list-style-type: none"> <li>·17대 재무이사('01.09.01~ '03.08.31)</li> <li>·18대 부회장('03.09.01~ '05.08.31)</li> </ul>	(전) 두산중공업(주) 부사장으로서 두산원자력기술상 기금 및 두산중공업 장학금 후원을 통해 학회 포상 및 장학 사업 발전에 기여함.



## 창립 50주년 기념 학술대회 수상자 명단

| 시상식 2019년 5월 23일(목) 14:30

| 장 소 한라홀 (3F)

### 학술발표회 우수논문상 (2018 추계학술발표회 발표논문)

성명	소속	성명	소속
김병재	충남대학교	윤소훈	조선대학교
김승현	울산과학기술원	이문언	포항공과대학교
김인국	울산과학기술원	전순혁	한국원자력연구원
김재순	서울대학교	최남재	서울대학교
김재준	University of Massachusetts Amherst	최인창	한양대학교
김재환	한국원자력연구원	홍지원	서울대학교
신동호	서울대학교	Adi Wijayanto	National Nuclear Energy Agency of Indonesia(BATAN) / KAIST

### 제1회 한국원자력학회 학생 학술대회 우수논문상

구분	성명	소속
학부생 세션	홍우성	세종대학교
	김형빈	한국과학기술원
	배준용	울산과학기술원
대학원생 세션	류동민	서울대학교
	소은서	중앙대학교
	송인영	울산과학기술원

### 2019년도 한국원자력학회 장학생

학교명	성명	학교명	성명
경북대학교	한승연	울산과학기술원	유승창
경희대학교	김도연, 장인규, 전명환	제주대학교	강한중, 심소정
단국대학교	강지현	조선대학교	김상연, 안예지
동국대학교	김선재	중앙대학교	소은서, 신현영
부산대학교	송진영, 최부민	포항공과대학교	한상수
서울대학교	노현택, 박태훈, 장호진	한국과학기술원	김현태, 엄현준, 채낙규
세종대학교	김현수	한양대학교	김의담, 박재형, 송지현
영남대학교	심지훈	한전 국제원자력대학원대학교	Ahmed Mohamed Elmashtoly

### NUCHI 장학생

학교명	성명
울산과학기술원	김재민

## 2019 한국원자력연차대회

**일시** 2019년 5월 22일(수)

**장소** 1층 (전시장:1층 C홀)

구분	일정	프로그램
패널세션 ※ 패널 I, II 동시진행	[패널세션 I] 09:30 ~ 12:30	<b>【패널세션( I )】“원전수출과 산업활성화” &lt;1층 A홀&gt;</b> <b>〈주제발표〉</b> #1. 한국수력원자력 박인식 처장 (한국수력원자력의 해외원전시장 진출을 위한 노력) #2. Westinghouse José Emeterio Gutiérrez 사장 (세계 원자력 발전시장 전망) #3. 한국원자력연구원 김금구 단장 (소형원자로 개발 전망과 SMART) #4. ROSATOM 동남아시아 Egor Simonov 지사장 (원자력산업의 세계 동향) <b>〈패널 코멘트〉</b> • 한국전력공사 황수돈 실장
	[패널세션 II] 09:30 ~ 12:30	<b>【패널세션(II)】“기후변화와 에너지믹스” &lt;1층 B홀&gt;</b> <b>〈주제발표〉</b> #1. 극지연구소 진 경 선임연구원 (지구온난화와 IPCC 특별보고서의 의의) #2. 일본원자력학회 Ken Nakajima 부회장 (제5차 에너지기본계획과 일본의 원자력발전) #3. 프랑스 원자력 및 대체에너지위원회 Pascal Chaix 부국장 (프랑스의 에너지 믹스에서의 원자력 에너지) #4. 주일영국대사관 Keith Franklin 일등서기관 (영국의 청정성장체제와 원자력의 역할) <b>〈패널 코멘트〉</b> • 한국원자력연구원 임채영 본부장 • 에너지경제연구원 임재규 선임연구위원
참가자 중식	12:30 ~ 14:00	<b>【참가자 중식】 &lt;5층 탐라홀 C&gt;</b>
산업전	14:00 ~ 14:40	<b>2019 국제원자력산업전 테이프 커팅식 및 전시장 순람</b>
원자력 60주년 기념식	14:40 ~ 15:40	<b>【원자력 60주년 기념식】 &lt;1층 A홀&gt;</b> 기념사: 정재훈 회장 (한국원자력산업회의) 축 사: 문미옥 차관 (미래창조과학부) 환영사: 김명현 회장 (한국원자력학회) 시상식 (원자력기술상, 원자력국제협력상)
	15:40 ~ 16:00	<b>주요인사 사진촬영 및 휴식시간</b>
기조강연	16:00 ~ 17:30	<b>【기조강연】 &lt;1층 A홀&gt;</b> • 산업·통상자원부 주영준 실장 • 에미레이트 원자력에너지공사 Mohamed Al Hammadi 사장 • 미국원자력학회 Maria Korsnick 회장

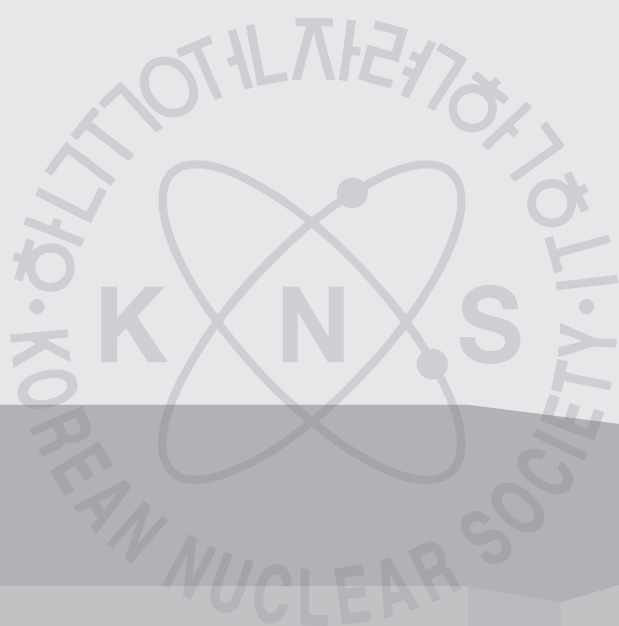
※ 한국원자력연차대회 기간 중 동시개최 예정인 '2019 국제원자력산업전' 무료입장 가능

KOREAN NUCLEAR SOCIETY

**KNS 2019 Spring**

**창립 50주년 기념 학술대회**

# 분과별 논제 및 발표자



## 1A

5. 23 (목)

## 고온가스로 (Very High Temperature Reactor)

| 좌장 조창근(Chang Keun Jo), 노재만(Jae Man Noh)

| 발표장소 402A

- 09:00 Comparative Study of Thermal Performance on Hydrogen Production Methods using VHTR – Part 2  
Eojin Jeon, Gyunyoung Heo, and Soyoung Park(KHU), Sang-IL Lee and Deok Hoon Kye(HEC)
- 09:20 Verification of GAMMA+ and CORONA Codes with Two-column Problem  
Jeong-Hun Lee, Nam-il Tak, Sung Nam Lee, and Chang Keun Jo(KAERI)
- 09:40 TROPY Code Verification and Validation on Tritium Inventory in a High Temperature Gas Cooled Reactor  
Sung Nam Lee and Nam-il Tak(KAERI)
- 10:00 Turbulence Model Assessment for Micro Modular Reactor Core  
Sung Nam Lee, Nam-il Tak, and Chang Keun Jo(KAERI)
- 10:20 Validation of the POSCA Code using the OGL-1 Experiment  
Nam-il Tak, Jeong-Hun Lee, Sung Nam Lee, and Chang Keun Jo(KAERI)
- 10:40 Coffee Break
- 11:00 Influence of Thermal Ageing on Mechanical Properties of Alloy 617  
Woo-Gon Kim, Injin Sah, Eung-Seon Kim, and Min-Hwan Kim(KAERI), INC Kusuma and Seon-Jin Kim(PKNU)
- 11:20 Preliminary Scale-down Standard Fuel Block Tests to Validate CORONA Code  
Chan Soo Kim and Eung Seon Kim(KAERI)
- 11:40 Control Schemes of S-CO<sub>2</sub> Cooled KAIST Micro Modular Reactor as Marine Propulsion Engine to Treat Rapid Load Change Condition  
Bong Seong Oh and Jeong Ik Lee(KAIST)
- 12:00 Interaction Between Dust and Fission Products in Primary Circuit of HTGR  
Sungdeok Hong, Nam-il Tak, Eungseon Kim, and Minhwan Kim(KAERI)

## 1B

5. 24 (금)

## 고온가스로 및 중수로 (Very High Temperature Reactor and Heavy Water Reactor)

| 좌장 김찬수(Chan Soo Kim), 정종엽(Jong Yeob Jung)

| 발표장소 402A

- 09:00 A Study on the Possibility of End-Fitting and Outlet Feeder Oxidation during Large Break LOCA with ECCS Impairment  
Bo Wook Rhee, Y.M. Song, and J.H. Bae(KAERI), S.R. Kim(NESS)
- 09:20 High Temperature Low Cycle Fatigue Behavior of Alloy 800H Weldments  
SEON JIN KIM, SEON GI LEE, and FAUZY EKA SAPUTRA(PKNU), WOO GON KIM and EUNG SEON KIM(KAERI)
- 09:40 Out-of-Pile Strontium Plateout Experiments  
Sungdeok Hong, Yeonku Kim, and Eungseon Kim(KAERI), JongBae Hwang(CNU)
- 10:00 CFD Simulation of Gas-Solid Fluidized Bed for CVD Coating of TRISO in Room-Temperature  
Byung Ha Park and Eung-Seon Kim(KAERI)
- 10:20 Research Status of the Effects of the Pressure Tube Deformation on the Power Deration  
EunHyun Ryu and Jong Yeob Jung(KAERI)
- 10:40 Coffee Break

- 11:00 PTLEAK - Program for Assessing the Channel Flow and Margin to Dryout of the CANDU Fuel Channel  
JONG YEOP JUNG and EUN HYUN RYU(KAERI)
- 11:20 Physical Understanding of Precipitation and Dissolution of Hydrides in Zirconium Alloys  
Young Suk Kim, Sung Soo Kim, and Jong Yeop Jung (KAERI)
- 11:40 New Rules for the Prediction of the Pressure Tube Diameter of the CANDU Reactor  
JONG YEOP JUNG(KAERI), HARTMANN WOLFGANG(CANTECH)
- 12:00 The Ordigin of Serration at High Temperature Deformation in Feeder Pipe Material in CANDU Reactor  
SungSoo KIM, Young Suk KIM, and Jong Yeob JUNG(KAERI)

## 1C

5. 24 (금)

### 경수로 및 원자로시스템기술 일반 (LWR and General Reactor Systems Technology)

| 좌장 강한옥(Han Ok Kang), 서경우(Kyoungwoo Seo)

| 발표장소 402A

- 13:30 LOCA Analysis Modeling with RADTRAD Code  
Seung Chan LEE(KHNP CRI)
- 13:50 The Study for Containment Aerosol and Iodine Removal Rates  
Seung Chan LEE, Duk Joo Yoon, and Min Jeong Kim(KHNP CRI)
- 14:10 Comparative Safety Analysis with MARS-LMR and SAS4A/SASSYS-1 Codes for PGSFR  
Jae-Ho Jeong, Sang-Jun Ahn, Jonggan Hong, and Seok-Hun Kang(KAERI)
- 14:30 Preliminary Calculation of Vapor Generation through Flashing Phenomenon for Natural Circulating Nuclear Reactor  
Wooseong Park and Yong Hoon Jeong(KAIST)
- 14:50 Thermodynamic Assessment of APR1400 Integrating the Liquid Air Energy Storage  
Jin Young Heo and Jeong Ik Lee(KAIST)

## 1D

5. 23. (목)  
- 24. (금)

### 고온가스로 및 연구로 (Very High Temperature Reactor and Research Reactor) – POSTER

| 좌장 탁남일(Nam-il Tak), 서경우(Kyoungwoo Seo)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P01D01 Validation of CORONA Code with SNU Multi-block Experiments  
Jeong-Hun Lee, Nam-il Tak, Sung Nam Lee, and Chang Keun Jo(KAERI)
- P01D02 Compressor Off-Design Performance Prediction with the Similitude Concepts for Supercritical CO<sub>2</sub> Cooled Small Modular Reactor  
Yongju Jeong, Seongmin Son, Seong Kuk Cho, and Jeong Ik Lee(KAIST), Seungjoon Baik(KAERI)
- P01D03 Preliminary Economic Study for HTGR Coupling with HTSE Hydrogen Production Process  
Taehoon Lee, Juho Lee, and Changkeun Jo(KAERI)
- P01D04 Comparative Design Study on the Intermediate Heat Exchanger Assembly of VHTR System  
YONGWAN KIM, BYOUNGHA PARK, and Eung Seon KIM(KAERI)
- P01D05 Comparison of Thermal Storage Media for Nuclear Renewable Hybrid System  
JUNGHWAN PARK, JINYOUNG HEO, INWOO SON, and JEONGIK LEE(KAIST)

- P01D06 Energy Share Optimization of Concentrated Solar Power and Nuclear Hybrid System  
In Woo Son, Jin Young Heo, and Jeong Ik LEE(KAIST)
- P01D07 Investigation of Magnetic Journal Bearing Instability Issues for MMR Condition  
Dokyu Kim and Jeong Ik Lee(KAIST), SeungJoon Baik(KAERI)
- P01D08 CFD Analysis of Magnetic Bearing Instability of S-CO<sub>2</sub> Turbomachinery  
YongJae Chae, DoKyu Kim, and JeongIk Lee(KAIST)
- P01D09 S-CO<sub>2</sub> Compressor Performance Test Plan Considering Measurement Uncertainty  
Seong Kuk Cho, Yongju Jeong, and Jeong Ik Lee(KAIST)
- P01D10 Evaluation of Vibratory Ground Motion for the JRTR Site  
Jeong-Soo Ryu and Sangik Wu(KAERI)
- P01D11 Study on the Scaling Method and Design of the Air-Water Flow Test Facility for Air-Entrained Pipe Break in a Research Reactor  
In Guk Kim, Ki-Jung Park, Min Kyu Jung, Hyunjong Kim, Kyoung Woo Seo, and Seong-Hoon Kim(KAERI)
- P01D12 Analytical Estimation on the Heat Losses in an Open Pool-Type Research Reactor  
Hyunjong Kim, Jungwoon Choi, Ki-Jung Park, Minkyu Jung, Hyungi Yoon, In-Guk Kim, Hong-Beom Park, Kyoung-Woo Seo, and Seonghoon Kim(KAERI)
- P01D13 Status of Vanadium Self-Powered Neutron Detector Depletion Test  
Do-Yeon Kim, Kyung Gun Kim, and Yu Sun Choi(KHNP CRI)
- P01D14 A Study on the Residence Time Calculation Method of a Decay Tank in Research Reactor  
Minkyu Jung, Hong-Beom Park, KyoungWoo Seo, and Seong-Hoon Kim(KAERI)
- P01D15 Improvement of the Pumped Thermal System Technology for Large-scale Electricity Storage  
Baptiste Py and Yong Hoon Jeong(KAIST)

## 1E

5. 23. (목)  
- 24. (금)

### 액체금속냉각로 (Liquid Metal Reactor) – POSTER

| 좌장 허균영(Gyunyoung Heo), 이유호(Youho Lee)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P01E01 The Concept of the Leak Detecting Device for Liquid Sodium Using Graphene Oxide Sensors  
Chungho Cho, Byung-Ho Kim, Jong-Man Kim, Youngil Cho, and Ji-Young Jeong(KAERI)
- P01E02 Design Features of Power Supply and Instrumentation Circuit for Mutual Inductance Type Liquid Metal Level Sensor  
Byeong-Yeon Kim, Jewhan Lee, Chungho Cho, Yong-Bum Lee, and Ji-Young Jeong(KAERI)
- P01E03 Validation of the Sodium Fire Models in the CONTAIN-LMR/1B-Mod.1 Code against the ABCOVE Experiments  
Churl Yoon, Sang June Ahn, and Seok Hun Kang(KAERI)
- P01E04 Evaluation of SG Blowdowntime for PGSFR SWRPRS  
Seong-O Kim, Sun Rock Choi, Ji-Woong Han, Huee-Youl Ye, and Hyun-Woo Lee(KAERI)
- P01E05 Review of the Aerosol Mass Tracking Method in the ISFRA Fission Product Transport Module for SFR Accident Analyses  
Churl Yoon and Seok Hun Kang(KAERI)
- P01E06 Pressure Loss Characteristics of a Finned-tube Heat Exchanger in PGSFR  
Dehee Kim, Hyungmo Kim, and Sun Rock Choi(KAERI)
- P01E07 LES Analysis of Thermal Striping in a Triple Jet Experiment  
Sun Rock Choi, Dehee Kim, Yohan Jung, Seok-Ki Choi, and Ji-Woong Han(KAERI)

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- P01E08 Theoretical Study on Sodium-Water Reaction in Printed Circuit Steam Generator  
Jonggan Hong, Kilsung Kwon, and Sang Ji Kim(KAERI)
- P01E09 Preliminary Development of a Copper Bonded Steam Generator for Minimizing a Sodium-Water Reaction  
Sunghyuk Im, Jonggan Hong, Ji-Woong Han, and Sun Rock Choi(KAERI)
- P01E10 Thermal Hydraulic Analysis on the Reactor Head Cooling of PGSFR  
Huee-Youl Ye, Seong-O Kim, Tae-Ho Lee, Ji-Woong Han, and SunRock Choi(KAERI)
- P01E11 Conceptual Operating Procedures for Sodium Purification System  
Byungho Kim, Jong Man Kim, Chung Ho Cho, and Ji Young Jeong(KAERI)
- P01E12 Thermal-Hydraulic Performance Analysis of an IHX-Combined Steam Generator with Serpentine Tube Bundles  
Hyungmo Kim, Jung Yoon, and Jaehyuk Eoh(KAERI), Namhyeong Kim and Moo-Hwan Kim(POSTECH), Dong Eok Kim(CAU)
- P01E13 Numerical Simulation on Intermediate Heat Exchanger at Low Flowrate Condition in PGSFR  
Seung Ho Ryu, Sun Rock Choi, Tae-Ho Lee, and Young-sang Joo(KAERI)
- P01E14 Preliminary Design of Refueling Decay Heat Removal System Steam-water Separator for the PGSFR  
Hyun-Woo Lee, Yohan Jung, Ji-Woong Han, and Sun Rock Choi(KAERI)
- P01E15 A preliminary Study on Steam Generator Sizing for the Sodium-Cooled Fast Reactor KALIMER-600  
Jin Su Kwon and Jeong Ik Lee(KAIST), Sang Ji Kim(KAERI)
- P01E16 Status of Manufacturing Experimental Apparatus to Investigate SWR Phenomenon in the PCSG  
Siwon Seo(ACT Co.), Jaeyoung Lee(HGU), Sangji Kim(KAERI)
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## 1F 경수로 및 원자로시스템규제기술 (Light Water Reactor and Reactor Systems Regulation Technology) – POSTER

5. 23. (목) – 24. (금) | 좌장 구분승(Bon Seung Koo), 이보욱(Bo Wook Rhee) | 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

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- P01F01 Performance Analysis of Two-stage Core Makeup Tank  
Soo Jai Shin, Young In Kim, Seungyeob Ryu, and Youngmin Bae(KAERI)
- P01F02 Specimen Tests for Candidate Materials of Ball Screw Assembly  
Myoung-Hwan Choi, Je-Yong Yu, Yong-Gyun Yu, and Jae-Ho Jung(KAERI)
- P01F03 Tube Inlet Orifice Design of a Once-Through Steam Generator Considering Various Operating Conditions  
Hun Sik Han, Han-Ok Kang, Juhyeon Yoon, Young In Kim, and Seungyeob Ryu(KAERI)
- P01F04 Preliminary Computational Study on Local Thermal-hydraulic Performance for Zigzag Flow Channel of Printed Circuit Heat Exchanger  
Cheong Bong Chang, Youngmin Bae, Hyunjun Cho, Young In Kim, and Sang Ji Kim(KAERI)
- P01F05 Preliminary Thermal Hydraulic Design of SMR Core with 13 x13 Annular Fuel Assemblies  
Hyuk Kwon and Seong-Jin Kim(KAERI), Jae Yeon Choi and Ser Gi Hong(KHU)
- P01F06 Preliminary Study on Dynamic Response of S-CO<sub>2</sub> Cycle Coupled to PWR SMR  
Jeong Yeol Baek and Jeong Ik Lee(KAIST), Sung Joong Kim(HYU)
- P01F07 Evaluation of Control Rod Heating Rate in SMART for Cycle 1  
Sungwook Choi, Seong-jin Kim, and Bon-seung Koo(KAERI)
- P01F08 Validation of MATRA-S for Core Pressure Drop Analysis in SMART Application  
Juhung Lee, K. W. Seo, H. Kwon, S. J. Kim, H. Seo, and D. H. Hwang(KAERI)
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- P01F09 Nuclear Terraforming Analysis of Mars for the Beginning of Colonization: Dreaming of Mr. Elon Musk, a Billionaire, in the SpaceX/Tesla, Inc. for Super-Ultra-Mega R&D Initiatives  
T.H. Woo(CUK)
- P01F10 Modeling of Steam Generator for Steam Rankine Cycle as Power Conversion System of Thermal Energy Storage  
Seunghwan Oh, Jinsu Kwon, and Jeong Ik Lee(KAIST)
- P01F11 Control Rod Position Indicator with High Performance for Reactor Precision Control  
Tae-Won Na, Hyung Huh, and Je-Yong Yu(KAERI)

### 2A

5. 23 (목)

#### 원자로 해석 방법론 I (Reactor Analysis Method I)

I 좌장 이현철(Hyun Chul Lee), 김우송(Woosong Kim)

I 발표장소 301

- 09:00 A New Approach for Real Variance Estimation Using Local Tally Correlation Between Neighboring Cells  
Ho Jin Park and Jin Young Cho(KAERI)
- 09:20 Preliminary Development of Simplified P3 based Pin-by-pin Core Simulator, SPHINCS  
Hyun Ho Cho, Hyunsik Hong, Han Gyu Lee, and Han Gyu Joo(SNU)
- 09:40 Three-Dimensional Hybrid CMFD (HCMFD) Algorithm for Efficient Pin-by-Pin Transient Analysis of PWRs  
Jaeha Kim and Yonghee Kim(KAIST)
- 10:00 Convergence Analysis of Fine Mesh Rebalance Method Coupled with LDEM-SCB(1) for Diffusion Equation  
Muhammad Habib and Hong Ser Gi(KHU)
- 10:20 Coffee Break
- 10:40 Evaluation of Implicit Uncertainty Considering Double Heterogeneity  
Tae Young Han, Jin Young Cho, and Chang Keun Jo(KAERI)
- 11:00 Observation of Variance Overestimation in Monte Carlo Multi-Physics Simulation  
Hyunsuk Lee, Peng Zhang, and Deokjung Lee(UNIST)
- 11:20 Pin-by-Pin 2D/1D SP3 FDM Scheme with 3D Assembly-wise CMFD Acceleration  
Jun Teak Hwang, Namjae Choi, and Han Gyu Joo(SNU)
- 11:40 Impacts of APEC-based Nodal Analysis on Pin Power Reconstruction  
Sungju Kwon and Joo Il Yoon(KEPCO NF), Yonghee Kim(KAIST)

### 2B

5. 23 (목)

#### 신형 원자로 (Advanced Reactors)

I 좌장 홍서기(Sergi Hong), 윤주일(Joo il Yoon)

I 발표장소 302

- 09:00 Study on Burnable Absorber Optimization and Fuel Management Strategy for 2 Batch APR1400 Very-Low-Boron Core  
Manseok Do, Xuan Ha Nguyen, Seongdong Jang, and Yonghee Kim(KAIST)
- 09:20 ATWS Responses of Sodium-cooled Fast Reactor with a FAST (Floating Absorber for Safety at Transient) Device  
Chihyung Kim and Yonghee Kim(KAIST)
- 09:40 McCARD Analysis for Pb-Bi-Zoned Accelerator Driven System at Kyoto University Critical Assembly  
Kyoseong Song, Sanghoon Jang, Hyung Jin Shim(SNU), Masao Yamanaka and Cheol Ho Pyeon(KU)
- 10:00 Neutronic Models for High-Performance Reflectors for The ATOM Core  
Xuan Ha Nguyen, Seongdong Jang, and Yonghee Kim(KAIST)
- 10:20 Coffee Break
- 10:40 Neutronics Effect to Reactor Core Analysis of Molybdenum Micro-cell Type Accident Tolerance Fuel  
Eun Jeong, Yunki Jo, Sooyoung Choi, Hyunsuk Lee, and Deokjung Lee(UNIST), Ho Cheol Shin and Kwangho Lee(KHNP CRI)
- 11:00 Breeding Potential Assessment of Reduced Moderation Pressurized Water Reactor Fuel Assembly  
Martinus I Made Adrian Dwiputra, Alexander Agung, and Andang Widi Harto(DNEEP UGM), Alexey Cherezov, Tung Dong Cao Nguyen, and Deokjung Lee(UNIST)

- 11:20 A Small Modular Reactor Core Design with Annular  $\text{UO}_2$  and FCM Fuel Rods  
SerGi HONG and JaeYeon CHOI(KHU)
- 11:40 Neutronic Analysis of a Small Breed-and-Burn Fast Reactor Cores using Recycling Options  
Yeonguk Jo and Ser Gi Hong(KHU)

## 2C

5. 24 (금)

### 원자로해석 방법론 II (Reactor Analysis Method II)

| 좌장 심형진(Hyung Jin Shim), 한태영(Tae Young Han)

| 발표장소 301

- 09:00 Leakage Feedback Method for Pin-by-Pin Core Calculation  
Hyunsik Hong and Han Gyu Joo(SNU)
- 09:20 Pin-wise Macroscopic Depletion Analysis Based on the Generalized Equivalence Theory  
Hwanyael Yu, Tae-suk Oh, and Yonghee Kim(KAIST)
- 09:40 Multi-physics Pin-by-Pin Core Analysis with Sub-channel T/H Calculation  
Jaeha Kim, KhurumSaleem Chaudri, and Yonghee Kim(KAIST)
- 10:00 Prediction of Pressurized Water Reactor Core Design Parameters Using Artificial Neural Network for Loading Pattern Optimization  
Hyunbin Jang and Hyun Chul Lee(PNU)
- 10:20 Coffee Break
- 10:40 Recent Development Status of Neutron Transport Code STREAM  
Sooyoung Choi, Jiwon Choe, Khang Hoang Nhat Nguyen, Woonghee Lee, Wonkyeong Kim, Hanjoo Kim, Bamidele Ebiwonjumi, Eun Jeong, Hyunsuk Lee, Kyeongwon Kim, Kiho Kim, and Deokjung Lee(UNIST)
- 11:00 Development Status of Nodal Diffusion Code RAST-K v2.2  
Jinsu Park, Jiwon Choe, Hanjoo Kim, Sooyoung Choi, Alexey Cherezov, Jaerim Jang, Dongmin Yun, Nguyen Trong Nhan Mai, Vutheam Dos, and Deokjung Lee(UNIST), Ho Cheol Shin and Hwan Soo Lee(KHNP CRI)
- 11:20 A RAST-K Module for Multiphysics Simulation and Accident Analysis of Pressurized Water Reactor Cores  
Alexey Cherezov, Hanjoo Kim, Jinsu Park, and Deokjung Lee(UNIST)
- 11:40 Preliminary Derivation of the APEC Functions for 3 Dimensional CANDU Color-sets with Liquid Zone Controllers  
Steven Wijaya, Seongdong Jang, and Yonghee Kim(KAIST)

## 2D

5. 24 (금)

### 원자로물리 일반 (Reactor Physics General)

| 좌장 조창근(Chang Keun Jo), 육승수(Seungsu Yuk)

| 발표장소 302

- 09:00 Convolutional Neural Network for BOC Pin Power Prediction  
Younduk Nam and Jinyoung Lee(KEPCO NF), Hyung Jin Shim(SNU)
- 09:20 Production of Axial Burnup Profiles of Spent Nuclear Fuels Discharged from OPR-1000 using STREAM/ RAST-K Core Follow Calculations  
Dong Jin Kim, Kyu Jung Choi, Ye Seul Cho, Na Yeon Seo, and Ser Gi Hong(KHU), Kiyoun Kim(KHNP CRI), Deokjung Lee(UNIST)
- 09:40 Determination of McCARD Upper Subcritical Limit for LWR Fuel Storage System  
Junkyung Jang and Hyun Chul Lee(PNU)
- 10:00 Feynman-alpha Method Experiment in AGN-201K  
Jong hoon Kim and Myung Hyun Kim(KHU)

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| 10:20 | Coffee Break   |
| 10:40 | Approximation Method of Determining Initial Core Design Parameters with a Given Energy Requirement<br>Alexandru Catalin Stafie, Jinman Kim, Bumhee Jo, and Chang Joo Hah(KINGS)            |
| 11:00 | A New Design Concept of Burnable Poison for Longer Cycle PWR<br>Aiman Dandi and Myung Hyun Kim(KHU)  |
| 11:20 | Verification of STREAM/RAST-K Code against Yonggwang Unit 3 Cycle 1<br>HuynWook Kang and Hyun Chul Lee(PNU)  |
| 11:40 | A Comparison of Cooling Schedules in Spent Nuclear Fuel Grouping Optimization by Simulated Annealing for Dry Cask Loading<br>Seung-gu Kang and Hyun Chul Lee(PNU), Ho Cheol Shin(KHNP CRI) |
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## 2E

5. 24 (금)

### 원자로해석 방법론 Ⅲ (Reactor Analysis Method Ⅲ)

| 좌장 조진영(Jin Young Cho), 박창제(Chang Je Park)

| 발표장소 301

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|-------|---|
| 13:30 | Recent Progress on Fast Reactor Analysis in UNIST CORE Laboratory<br>Xianan Du, Jiwon Choe, Sooyoung Choi, Alexey Cherezov, Woonghee Lee, Quoc Tran Tuan, Jinsu Park, and Deokjung Lee(UNIST) |
| 13:50 | Application of Approximate Minimum Degree Ordering Scheme to Burnup Matrix<br>Yong Hee Choi and Jin Young Cho(KAERI)  |
| 14:10 | A Response Matrix Formulation of the Refined AFEN Method with Interface Flux Moments in the Two-Dimensional Hexagonal Geometry<br>Jae Man Noh(KAERI)  |
| 14:30 | Validation of MCS Coupled Neutron-Photon Calculations with SINBAD Benchmark Experiments<br>Fathurrahman Setiawan, Matthieu Lemaire, Alexey Cherezov, and Deokjung Lee(UNIST)                  |
| 14:50 | Coffee Break  |
| 15:00 | Multi Physics Coupling of RAST-K for Multi-Cycle Core Calculation<br>Hanjoo Kim, Alexey Cherezov, Jinsu Park, and Deokjung Lee(UNIST), Ho Cheol Shin and Hwan Soo Lee(KHNP CRI)               |
| 15:20 | Coupled Safety Analysis for Pressurized Water Reactors<br>Abd El Rahman Abou El Ala and Aya Diab(KINGS), Alya Badawi(ENGAU)   |
| 15:40 | Radial and Axial Domain Decomposition of a Core Thermal-Hydraulics Code for Massively Parallel Computing Platforms<br>Jaejin Lee, Alberto Facchini, and Han Gyu Joo(SNU)                      |
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## 2F

5. 23. (목)  
- 24. (금)

### 원자로 물리 및 계산과학 (Reactor Physics and Computational Science) – POSTER

| 좌장 박호진(Ho Jin Park), 최용희(Yong Hee Choi)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

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|--------|--|
| P02F01 | Prediction of the Measured Gold Reaction Rate at OPAL Reactor Using McCARD<br>Byungchul Lee, Haksung Kim, and Gyuhyong Rho(KAERI)                    |
| P02F02 | Axial Burnup Effect on the Multiple Misloading Analysis for Burnup Credit Cask Design<br>Saed Alrawash, Muth Boravy, and Chang Je Park(Sejong Univ.) |
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|--------|---|
| P02F03 | A Comparative Computational Analysis of the MCS and MCNP6 Monte Carlo Codes for MOX Critical Benchmark Problems<br>Long Ta Duy and Ser Gi Hong(KHU)                       |
| P02F04 | Effect of the Unbalanced Ray Distribution in the Method of Characteristics<br>Gil Soo Lee and Jaejun Lee(KINS), Adriaan Buijs (McMaster Univ.)                            |
| P02F05 | Convolutional Neural Network for Power Distribution Prediction in PWRs<br>Jinyoung Lee and Younduk Nam(KEPCO NF), Han Gyu Joo(SNU)  |
| P02F06 | Radiation Shielding Evaluation for Neutron Irradiation System<br>Kyung-O Kim, Gyuhong Roh, and Byungchul Lee(KAERI)   |
| P02F07 | DeCART Solution for VERA Benchmark Problems from 5 to 9<br>Jin Young Cho and Ho Jin Park(KAERI)   |
| P02F08 | Effect of Axial Power Distributions of Fuel Assemblies on Axial Offset Anomaly<br>SeoJeong Lee and Ji-Eun Jung(KHNP CRI)  |
| P02F09 | Effect of the Reactor Coolant Flow Rate on Axial Offset Anomaly Risk Assessment<br>SeoJeong Lee(KHNP CRI)   |
| P02F10 | An Efficient Approach for Modeling Hexagonal Lattice in McCARD<br>Min Jae Lee and Jae-Yong Lim(KAERI)   |
| P02F11 | Neutronic Analysis of Fuel Assembly Using Accident Tolerance Fuel<br>Yunki Jo, Eun Jeong, and Deokjung Lee(UNIST)   |
| P02F12 | T/H Feedback Analysis for Thorium Epithermal Reactor with MCS Code<br>Hong Yeop Choi and Chang Je Park(Sejong Univ.)  |
| P02F13 | Optimization of Control Rod Operation for Soluble-Boron Free SMPWR with Zircaloy Reflector<br>Jaerim Jang, Jiwon Choe, Sooyoung Choi, Jinsu Park, and Deokjung Lee(UNIST) |

## 원자력시설해체 및 방사성폐기물관리 (Nuclear Facility Decommissioning and Radioactive Waste Management)

### 3A 5. 23 (목)

#### 원자력시설해체 및 방사성폐기물관리 I (Nuclear Facility Decommissioning and Radioactive Waste Management I)

I 좌장 김용덕(Yong Deog Kim), 최우석(Woo-seok Choi)

I 발표장소 300

- 09:00 Experimental Study on Signs of Ice Formation in Vacuum Drying  
Kyoung-Sik Bang, Yun-Young Yang, Ju-Chan Lee, Seung-Hwan Yu, and Woo-Seok Choi(KAERI)
- 09:20 Introductions of US DOE Multi-modal Transportation Test and Korean MMTT  
Woo-seok Choi, Sang soon Cho, Jaehoon Lim, and Ki-Seog Seo(KAERI)
- 09:40 A Comparative Shielding Analysis of the KN-12 Cask with MCNP6 and SCALE6.1  
Ye Seul Cho, and Ser Gi Hong(KHU), Dae Sik Yook and Ara Go(KINS)
- 10:00 Leak Detection Method for Integrity Monitoring of Spent Nuclear Fuel Dry Storage Casks  
Hyong Chol Kim, Sam Hee Han, Dong Jae Park(NSE)
- 10:20 Characterization Inspection Plan for PWR Spent Fuel Dry Storage  
Donghee Lee, Yongdeog Kim, and Kiyoun Kim(KHNP CRI)
- 10:40 Coffee Break
- 11:00 A Mechanoelectrical Property-controllable Smart Paint and Its Application to the Structural Integrity Monitoring of Spent Fuel Dry Storage Canisters  
YONGDEOG KIM and DONGHEE LEE(KHNP CRI), SANG-HEE YOON(Inha Univ.)
- 11:20 Development Status of Oxide Reduction Process for Pyroprocessing  
Eun-Young Choi, Min Ku Jeon, and Sung-Wook Kim(KAERI)
- 11:40 Criticality Analysis of Spent Fuel Storage System Using McCARD Code  
Junkyung Jang and Hyun Chul Lee(PNU)
- 12:00 Residual Decay Energy Sensitivity for Long-term Cooling of Spent Nuclear Fuel  
Taehyeon Kim, Kiyoun Kim, and Sunghwan Chung(KHNP CRI), Dongkyu Lee(KONES)

### 3B 5. 24 (금)

#### 원자력시설해체 및 방사성폐기물관리 II (Nuclear Facility Decommissioning and Radioactive Waste Management II)

I 좌장 정관성(Kwan Seong Jeong), 김태운(Tae Woon Kim)

I 발표장소 300

- 09:00 Changes of Iodines on Platinum Catalyst Used as Hydrogen Mitigation  
Hee-Jung Im and Jei-Won Yeon(KAERI)
- 09:20 Study on Formation of  $\text{CH}_3\text{I}$  in  $\text{NaI}$  and  $\text{CH}_3\text{COC}_2\text{H}_5$  (MEK) Solution under Gamma Irradiation  
Minsik Kim, TaeJun Kim, and Jei-Won Yeon(KAERI)
- 09:40 Uncertainties of Source Term Estimation in Fukushima Accident  
Tae Woon Kim and Seok Jung Han(KAERI)
- 10:00 Chemical Decontamination of Concrete Waste Generated from NPP Decommissioning  
HyunJu Kim, Seongsik Nam, Seok-ju Hong, Sangsoo Han, and Wooyong Um(POSTECH)
- 10:20 Evaluation of Metal Cutting Technologies for Decommissioning of Nuclear Power Plants  
Ga-Ram Lee and Chang-Dae Park(UST I KIMM), Byung-Ju Lim(KIMM)

- 10:40 Coffee Break
- 11:00 Evaluation of Disposal Waste Production from AGN-201K Reactor as a Preliminary Decommissioning Plan  
Tae-Yang Noh, Jun-Ho Park, Min-Han Lee, and Myung Hyun Kim(KHU)
- 11:20 Considerations on Safety in the Transition Period from Operation to Decommissioning of Nuclear Facilities  
KwanSeong Jeong, SeungKook Park, DaeSeo Koo, EunJoong Lee, InHye Hahm, JaeHyun Ha, ByungChae Lee, SuJung Min, DaeHyeon Kim, JunHa Kim, SangBum Hong, and BumKyung Seo(KAERI)
- 11:40 Application of Cobalt Hexacyanoferrate Coated  $\text{Fe}_3\text{O}_4$  Nanoparticle for Cesium ion ( $\text{Cs}^+$ ) Adsorption  
Thi Ha Lan Le, Thi Minh Sang Nguyen, DinhTrung Nguyen, An Son Nguyen, and Suk Soo Dong(DLU)
- 12:00 Development of the Pyrolysis for Volume Reduction of Organic Solid Waste Containing Uranium  
Yeong-jong Ju, Jeong-myeong Kim, Nam-chan Cho, and Seung-hoon Han(KEPCO NF), Ho-seung Jeon, Jun-bae Lee, and Jang-su Lee(JEON TECH. CO., LTD.)
- 12:20 Radioactivity Evaluation Considering Operation History for Decommissioning Plant  
YoungJae Maeng, Hyunchul Lee, Kyungsik Kim, and Sunghoon Yoo(KRIST)

## 3C

5. 23. (목)  
– 24. (금)

### 원자력시설해체 및 방사성폐기물관리

#### (Nuclear Facility Decommissioning and Radioactive Waste Management) – POSTER

| 좌장 최병선(Byung-Seon Choi), 김선병(Seon Byeong Kim) | 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P03C01 The Study for the Enhancement of Waste Tracking System (WTS) using IoT  
Sungjong Kim, changhwan Cho, and kwangyoung Sohn(Miraeen), hg Kang, sh Han, and yj Ju(KEPCO NF)
- P03C02 Analysis on the Cutting Method of SF Rods Supplied to Decladding  
Young-Hwan Kim, Yung-Zun Cho, and Young-Soon Lee(KAERI)
- P03C03 Electrochemical Potentiodynamic Repassivation Behavior of Type 304L Stainless Steel  
Hyung Min Jang, Hong-pyo Kim, and Dong Jin Kim(KAERI), Jong Hyun Lee(CNU)
- P03C04 Experimental Design for Recovery of Nd from NdFeB Magnet by using Molten Salt Technique and Liquid Cd Cathode  
Younghwan Jeon, Gwan Yoon Jeong, Jungho Hur, and Jaeyoung Park(UNIST)
- P03C05 Organic Nanocrystals for Efficient Uranium Sorption  
Kangwoo Jin, Jaeyeon Bae, and Jinhee Park(DGIST), Jinkyu Park(KAERI)
- P03C06 Chemisorption of Organic Iodide by Aryl C-H Bond Activation in MOFs  
Byeongchan Lee and Jinhee Park(DGIST)
- P03C07 A Study for Development a Porous Materials to Extract Alkanes from Liquid Radioactive Wates  
Jongjin Kim and Junhyuck Im(KAERI), Hyungwoo Kim and Donghoon Seoung(JNU)
- P03C08 Approaches to Release a Very Low-Level Waste (VLLW) from Regulatory Control  
Jeong-Guk Kim, Won Hyuk Jang, MalGoBaGaeBitNaLa Yoo, Yujeong Choi, Jongjin Kim, Hee-Seoung Park, and Dae-Seok Hong(KAERI)
- P03C09 Control Logic Design of Sensor Transport System for DCSS Inspection  
Daewon Kim, kyoungwon Yoon, Kyoungyong Noh, Misuk Jang, and Seoungrae Kim(NESS)
- P03C10 Integration of Operational and Dismantled Waste and Improvement of Information Function  
HeeSeoung Park, IISik Kang, DongJu Lee, HongRae Jeon, YunJeong Hong, JeongGuk Kim, WonHyuk Jang, KiBaek Shin, JunHyuck Im, JongJin Kim, and DaeSeok Hong(KAERI)
- P03C11 System Development Strategy for Removal of Boron Discharged from PWR NPP's  
Duk-won Kang, Sang-woo Noh, Seung-il Kim, and Joon-seok Lee(eLIM Global), Kyung-seok Kang(Siontech)

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- P03C12 Environmental Risk Assessment for Long Term Storage Facility in Bukit Kledang, Perak, Malaysia  
Ashraf Musaaddin and Juyoul Kim(KINGS)
- P03C13 Mechanical Stress Analysis on the Disposal Container and the Solidified Wastes of the Gyeongju LILW Repository  
Jaeyeong Park, Gwanyoon Jeong, Jungho Hur, and Hyeongjin Byeon(UNIST)
- P03C14 Changes in Sorption Properties of Copper Exchanged Bentonite  
Jae-Kwang Lee, Min-Hoon Baik, Jongtae Jeong, and Ji-Hun Ryu(KAERI)
- P03C15 Preparation of Regulatory Clearance for Organic Liquid Radwaste at KAERI  
Ki Baek Shin, Ji Young Song, Dong Han Yoo, Jun Hyuck Im, and Dae Seok Hong(KAERI), In Ho Kim(CNU)
- P03C16 Analysis on Effect of Decreased Decay Time on Thermal Dimensioning of SNF Direct Disposal System  
In-Young Kim and Dong-Keun Cho(KAERI)
- P03C17 Design and Operation of Chemical Injection and Decomposition&Treatment Facility  
Hak Soo Kim and Cho Rong Kim
- P03C18 Analysis of Factors Influencing Internal Exposure by Factors Causing Radioactive Aerosols  
Hak Yun LEE, Sun Il KIM, and Jong Soon SONG(CSU)
- P03C19 Evaluation of Silver Exchanged Zeolites Sorbent for the Capture of Radioactive Methyl Iodide  
Heong sub Oh and Jaeyoung Lee (HGU)
- P03C20 Status of Unit Cost Factor Development for Nuclear Facilities in KAERI  
Seungkook Park, Hyung Gon Jin, and Chang Wook Shin(KAERI)
- P03C21 Safety Assessment Tools and Case Studies of the Decommissioning Waste Disposal  
Jongtae Jeong, Min Hoon Baik, Jae Kwang Lee, and Ji-Hun Ryu(KAERI)
- P03C22 Speciation and Removal Properties of Cobalt in the SP-HyBRIDTM Waste Solution  
S.Y. Park, H.J. Won, W.K. Choi, J.H. Sim, H.C. Eun, S.B. Kim, and B.K. Seo(KAERI)
- P03C23 Removal of Radioactive Oxide Film Using Acidic and Oxidative Decontamination Foams  
Wangkyu Choi(KAERI) and Seonbyeong Kim(KAERI)
- P03C24 Calculation of Dose Fractions for Discounted Radionuclides in Selecting Potential Radionuclides  
Hyung-Woo Seo and Jin-Won Son(KHNP CRI)
- P03C25 Evaluation of Gaseous Radioactive Iodine Uptake by a New Hybrid Adsorbent  
Byung-Seon Choi, Seon-Byeong Kim, and Jeikwon Moon(KAERI)
- P03C26 Suggestions on Application of Wide-Range 3D Laser Scanner to the Decommissioning Process of Nuclear Facilities  
Taebin Yoon, Sukhoon Kim, Byungil Kwon, Jaehoon Kim, and Hyejin Kim(FNC Tech.)
- P03C27 Development of Decommissioning Waste Treatment Method Optimizing System  
Inhye Hahm, Daeseo Koo, Kwangseong Jeong, Jaehyun Ha, Seungkook Park, Sangbum Hong, and Bum Kyoung Seo(KAERI), Daehyeon Kim(KHU)
- P03C28 Study on Reliability Improvement of Inventory Calculation of Concrete in Cyclotron Facility  
Eunjoong Lee, Sang Bum Hong, Inhye Hahm, Byungchae Lee, and Junha Kim(KAERI)
- P03C29 Decontamination of Cementitious Waste Using Deep Eutectic Solvents  
James Amphlett and Sungyeol Choi(KAIST), Richard Foster, Maengkyo Oh, and Keun-Young Lee(KAERI)
- P03C30 Equilibrium Calculations for Aqueous Systems of HyBRID Dissolution of Magnetite  
Byung-Chul Lee(HNU), Seon Byeong Kim and Jei-Kwon Moon(KAERI)
- P03C31 Preparation Activities to Consider during Operations of Nuclear Power Plants for Decommissioning  
Jihwan Yu, Jungwun Kim, and Hyungwoo Seo(KHNP CRI)
- P03C32 UO<sub>2</sub> Contaminated Soil Clean-up Method Using Supercritical CO<sub>2</sub> and Reagent  
Tae hun Kim and Kwangheon Park(KHU)
- P03C33 Magnetic Nanoparticle Embedded in Functionalized Mesoporous Silica for Several Applications  
Jin-Wook Jang, Thiruparasakthi Balakrishnan, and Sung-Min Choi(KAIST)
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- P03C34      Aerosol Analysis System for Internal Dose Assessment of Worker's Internal Dose in D&D  
Min-Ho Lee , Wonseok Yang, Nakkyu Chae, and Sungeol Choi(KAIST)
- P03C35      The Study on Evaluation Method of Physical Inventory of Nuclear Facilities  
SuJung Min, GuawnSung Jung, SeungKook Park, and SangBum Hong(KAERI), San Chae(HYU),  
JaeHak Cheong(KHU)
- P03C36      Decision of Site Reuse Scenario Applying Analytical Hierarchy Process (AHP) after Decommissioning  
Nuclear Power Plant  
Che Wook Yim , Chang Ho Shin, and Jong Kyung Kim(HYU)
- P03C37      Thermal Analysis of HISTORM-100 Dry Storage Cask with Heterogeneous WH14X14 Fuel Assembly  
using COMSOL MULTIPHYSICS Program  
SunWoo Park and KwangHeon Park(KHU)
- P03C38      A Criticality Analysis of the Misloading Assemblies in the 32 Burnup Credit Cask  
Seung Uk Yoo, Hyuk Han, Ye Ji Yune, and Chang Je Park(Sejong Univ.)
- P03C39      Analysis for Thermal Test Assessment Method of Spent Fuel Concrete Cask Using a Scale Down Model  
Ju-Chan Lee, Kyung-Sik Bang, Seung-Hwan Yu, and Woo-Seok Choi(KAERI), Sungho Ko(CNU)
- P03C40      A study of Sensitivity of Partial Defect Detection Capability Using Scintillator-photodiode Detector with  
17x17 Spent Fuel Assemblies  
Yeongjun Kim and ManSung Yim(KAIST)
- P03C41      Influence of Ce(3+) Cation on Structural Property of Uranium Dioxide  
Dong Woo Lee, Jeongmook Lee, Jong-Yun Kim, and Sang Ho Lim(KAERI)
- P03C42      Criticality Safety Review using WIMS-AECL Code in CANDU6 Spent Fuel Pool  
Donghwan Park and Youngae Kim(KHNP CRI)
- P03C43      Measurement of Neutron Shielding Materials Property for the Spent Fuel Cask  
Minsu Ju and Jinyoung Chung(BRNC), Teahoon Jeon and Jungho Song(Orbitech), Sungkug Hwang and  
Yeonoh Lee(SeAH), Kevin Ray Ayag and Hongdoo Kim(KHU)
- P03C44      Laser-induced Breakdown Spectroscopy for in-situ Analysis of Nuclear Materials: Aqueous Solution  
Yunu Lee and Sungeol Choi(KAIST)

### 4A

5. 23 (목)

#### 핵연료 I (Nuclear Fuels)

I 좌장 김준환(Jun Hwan Kim), 김용덕(Yong Deog Kim)

I 발표장소 201A

- 09:00 The Stability of Cr Alloy Coating Layer under Mechanical Contact and High Temperature Steam at 1200 °C  
Young-Ho Lee, Jung-Hwan Park, Il-Hyun Kim, Dong-Jun Park, Yang-Il Jung, Byoung-Kwon Choi, and Hyun-Gil Kim(KAERI)
- 09:20 Progress of Accident Tolerant Fe-based Alloy Cladding Development at KEPCO NF  
Hun Jang, Sung-yong Lee, Dae Gyun Ko, Chae-ho Lim, Chan Do Jung, Yoon Ho Kim, and Seung Jae Lee(KEPCO NF), Hyunmyung Kim, Chaewon Kim, and Changheui Jang(KAIST)
- 09:40 Technology Development of Barrier Cladding for the Metal Fuel  
Jun Hwan Kim, Sunghwan Yeo, Sung Ho Eom, Sung Ho Kim, and Jeong Yong Park(KAERI), Min Soo Lee and Tai Hong Yim(KITECH)
- 10:00 Study of Annular Fuel Fabrication Technology in a Viewpoint of Microstructure  
Sang-Gyu Park, Kiho Kim, and Jeong-Yong Park(KAERI)
- 10:20 Coffee Break
- 10:40 Characterization of U-10wt.%Zr-5wt.%RE Fuel Slugs Recycling Metallic Fuel Scrap  
Seung-Uk Mun and Sun-Ig Hong(CNU), Ki-Hwan Kim and Seoung-Woo Kuk(KAERI)
- 11:00 Reactivity Evaluation of U-Zr Melt Residue after Melting in the Graphite Crucible  
Seong-Jun Ha and Young-Kook Lee(Yonsei Univ.), Jeong-Yong Park and Seoung-Woo Kuk(KAERI),
- 11:20 Aspect of Breakaway Oxidation of a Zirconium Alloy Cladding Tube during Oxidation at 800 °C  
Cheol Min Lee and Young-Soo Han(KAERI), Gwan Yoon Jeong and Dong-Seong Sohn(UNIST)
- 11:40 Microscopic Characterization on High Temperature Steam Oxidation of Various Yttrium DopedFeCrAl Alloys  
Sungyu Kim, Joonho Moon, and Chi Bum Bahn(PNU)

### 4B

5. 23 (목)

#### 원자력재료 I (Nuclear Materials I )

I 좌장 김동진(Dong-Jin Kim), 김원주(Weon-Ju Kim)

I 발표장소 201B

- 09:00 Microstructural Characterization of Proton-Irradiated Type 316 Stainless Steel  
Yun Soo Lim, Seong Sik Hwang, Dong Jin Kim, Min Jae Choi, and Jong Yeon Lee(KAERI)
- 09:20 Application of High-Frequency Needle Peening Treatment on Austenite Stainless Steel  
Seunghyun Kim, Seung Gun Lee, Yongjoon Kang, and Dong-Jin Oh(KIMS)
- 09:40 Repair Technology by Ni Electrodeposition for RPV Cladding  
Seong Sik Hwang, Min Su Kim, Eun Hee Lee, and Dong Jin Kim(KAERI)
- 10:00 Electrochemical Roles of Lead Species on Stress Corrosion Cracking of Alloy 600  
Do Haeng Hur, Won-Ik Choi, Geon Dong Song, and Soon-Hyeok Jeon(KAERI)
- 10:20 Coffee Break
- 10:40 Feasibility Study for Application of Nonlinear Ultrasonic Technique for CASS Material  
Sung-Sik Kang and Jin-Gyum Kim(KINS), Jongbeom Kim and Kyung-Mo Kim(KAERI), Byeongseo Kong and Changheui Jang(KAIST), Kyung-Young Jhang(HYU)

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- 11:00 A Study on Creep Characteristics Evaluation and Creep Life Prediction of Alloy 690 Steam Generator Tube  
Jongmin Kim, Woogon Kim, and Minchul Kim(KAERI)
  - 11:20 A study of Microstructure and Electrochemical Properties of Neutron Absorber  
Jung Hwan Lee, Yunju Lee, Seung Chang Yoo, and Ji Hyun Kim(UNIST), Seunghyun Kim(KIMS)
  - 11:40 Corrosion Behaviors of Transition Metals in Liquid Na and LBE: A First-principles Study  
Jeong-Hwan Han and Takuji Oda(SNU)
  - 12:00 Evaluation of Solution Enthalpy for Key Gaseous Impurities in Liquid Sodium by Quantum Mechanical Calculations  
Junhyoung Gil and Takuji Oda(SNU)
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## 4C

5. 24 (금)

### 핵연료 II (Nuclear Fuels II)

| 좌장 김윤호(Yoon Ho Kim), 김효찬(Hyochan Kim)

| 발표장소 201A

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- 09:00 Raman Study of Lattice-Doped Uranium Dioxide  
Jeongmook Lee, Jandee Kim, Jong-Yun Kim, and Sang Ho Lim(KAERI), Young-Sang Youn(YU), Choah Kwon and Byungchan Han(Yonsei Univ.)
  - 09:20 Evaluation of Fe-20Cr-2Si Oxidation Resistance in 1200 °C Steam Environment  
Joonho Moon, Sungyu Kim, and Chi Bum Bahn(PNU), Ji Hyun Kim(UNIST), Michael P. Short(MIT)
  - 09:40 Development of Multidimensional Entire Fuel Rod Analysis Module (MERCURY) for Simulation of Fuel Behavior during LOCA  
Hyochan Kim and Sunguk Lee(KAERI), Jinsu Kim and Junghwan Yoon(KAIST)
  - 10:00 Characterization of Pellet-Clad Mechanical Interaction in a Failed Spent Fuel Rod  
Yang Hong Jung, Seung Je Baik, Yeong Gkan Jin, and Sang Bok Ahn(KAERI)
  - 10:20 Coffee Break
  - 10:40 Development Status of Improved UO<sub>2</sub> Fuel in the KEPCO NF  
Kwang-Young Lim, Tae-Sik Jung, Yeon-Su Na, Min-Jae Ju, Jung-Beom Kim, and Seung-Jae Lee (KEPCO NF)
  - 11:00 Additive Manufacture of Nuclear Fuel Supports and Valve Items  
Suk Hoon Kang and Chang-Kyu Rhee(KAERI), Won Hee Lee(Samshin), Nam-Gyu Park(KEPCO NF), Hee-Sung Ann(BEES)
  - 11:20 Loss Control of Casting Methods for Metallic Fuel Fabrication  
Seoungwoo Kuk, Kyungchai Jeong, Seokjin Oh, Kihwan Kim, Jeong-Yong Park, and Seung-Uk Mun(KAERI)
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## 4D

5. 24 (금)

### 원자력재료 II (Nuclear Materials II)

| 좌장 장진성(Jinsung Jang), 김태규(Tae Kyu Kim)

| 발표장소 201B

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- 09:00 Microstructure Evolution and Performance of Neutron Absorber in Spent Nuclear Fuel Pool  
Yunsong Jung, Woong Ha, and Sangjoon Ahn(UNIST), Kiyoung Kim(KHNP CRI)
  - 09:20 A Phase Field Study of Microstructure Evolution of Polycrystalline Tungsten under Irradiation  
Yousung Han(INU), Hao Wang, Sudipta Biswas, and Vikas Tomar(PU)
  - 09:40 Development of Potential Model of Tungsten for Classical Molecular Dynamics Simulation  
Woonghee Cho and Takuji Oda(SNU)
  - 10:00 A Molecular Dynamics Study on the Early Stage Oxidation of Nickel Surface  
Kwang Beom Ko and Ji Hyun Kim(UNIST)
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10:20	Coffee Break
10:40	Probabilistic Estimation of Fatigue Lifetime with Time-Series Data and Markov Chain Monte Carlo Simulation Jae Phil Park and Chi Bum Bahn(PNU), Subhasish Mohanty(ANL)
11:00	Development of Potential Model for Radiation Damage Simulation in $\alpha$ -Fe Sehyeok Park and Takuji Oda(SNU)
11:20	Additive Manufacturing for Wear Resistant Component in Nuclear Reactor Jinsung Jang, Min Ha Shin, Chang Hee Han, and Junhyun Kwon(KAERI), Do-Hyang Kim(Yonsei Univ.)
11:40	Effect of Thermal Aging on the Corrosion Behaviors of ER316L Stainless Steel Welds in Simulated PWR Environments Junjie Chen, Changheui Jang, Qian Xiao, Byeong Seo Kong, Gokul Obulan Subramanian, and Ji Ho Shin(KAIST)
12:00	A Study on Microstructure of Functionally Graded Composite Steels for Lead-bismuth cooled Fast Reactor Cladding Application Jeonghyeon Lee, Taeyong Kim, and Ji Hyun Kim(UNIST)

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## 4E

### 핵연료 (Nuclear Fuels) – POSTER

5. 23. (목)  
– 24. (금)

| 좌장 장훈(Hun Chang), 전상채(Sang-Chae Jeon)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

P04E01	Feasibility Study for Manufacturing High-density LEU $U_3Si_2$ Plate-type Fuel Yong Jin Jeong, Sunghwan Kim, Hwa Young Song, Dong Hyon Kang, Cheol Hong Park, and Jong Man Park(KAERI)
P04E02	Experimental Investigation on Tensile Test Properties of EB Welded Joints of Aluminum 6061-T6 Alloy for Plate-type Fuel Assembly Fabrication Kim Soosung, Kang Donghyeon, Jeong Yongjin, and Park Jongman(KAERI)
P04E03	Numerical Analysis for Structural Integrity of a Fresh Fuel Shipping Container Su-pil Ryu, Joo-hong Chun, Nam-gyu Park, and Seung-jae Lee(KEPCO NF)
P04E04	Reaction Characteristics at Fuel Rod Surface Obtained from Metal Fuel Fabrication Process Kyunchai Jeong, Seokjin Oh, Kihwan Kim, Seoungwoo Kook, and Jeongyong Park(KAERI)
P04E05	Spacer Grid Lateral Crush Strength depending on Welding Methods Joo-Young Ryu, Han-Gil Woo, Nam-Gyu Park, and Seung-Jae Lee(KEPCO NF)
P04E06	Feasibility Study on Fabrication Technology for Transmutation Fuel with Surrogate Alloys Jong-Hwan Kim, Ki-Hwan Kim, Jung Won LEE, Seoung Woo Kuk, Jeong-Yong Park, Jin-SiK Cheon, and Sung-Ho Kim(KAERI)
P04E07	Characterization of the Thermal Conductivities of KAERI's Accident-Tolerant Fuel Pellets with Aligned Metal Particles Dong Seok Kim, Dong-Joo Kim, Sang-Chae Jeon, Keon Sik Kim, Jong Hun Kim, Ji-Hae Yoon, and Jae Ho Yang(KAERI)
P04E08	Comparison of Cesium Retention Ability in Cesium Silicates at High Temperatures Sang-Chae Jeon, Dong-Joo Kim, Dong Seok Kim, Keon Sik Kim, Jong Hun Kim, Ji Hae Yoon, and Jae Ho Yang(KAERI)
P04E09	Defect Characteristic for Metallic Fuel Slug by Casting Paramerters Hoon Song, YoonMyung Woo, SangGyu Park, and JeongYong Park(KAERI)

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- P04E10 Preliminary Study of High-density LEU Dispersion Targets Using Atomized Uranium-Aluminum Alloy Powder  
Taewon Cho, Kinam Kim, Sungchan Park, Yongjin Jeong, Kyuhong Lee, Sunghwan Kim, and Jongman Park(KAERI)
- P04E11 Mathematical Expressions for the Fractional Release of a Fission Product from an HTR Nuclear Fuel Element  
Young Min Kim, Tae Hoon Lee, and Chang Keun Jo(KAERI)
- P04E12 Random Particle Generation for a Failure Analysis on the Coated Fuel Particles of an HTR  
Young Min Kim, Chang Keun Jo, and Eung Seon Kim(KAERI)
- P04E13 Heavy Ion Irradiation Study of Coated U-7Mo/Al Dispersion Fuels  
Sunghwan Kim, Yong Jin Jeong, Kyu Hong Lee, Ki Nam Kim, and Jong Man Park(KAERI), Kun Mo, Yinbin Miao, Yeon Soo Kim, and Abdellatif M. Yacout(ANL)
- P04E14 Effect of Proton Irradiation on the Mechanical Property of Nano-Porous Zirconium Oxide Layer Fabricated by Anodization Technique  
Jung Woo Kim, Yang Jeong Park, Jaewoo Lee, and Sung Oh Cho(KAIST)
- P04E15 Hydride Effect on Low-cycle Fatigue Property of HANA-6 Cladding Tube  
Dae Gyun Ko, Hun Jang, Yoon Ho Kim, and Seung Jae Lee(KEPCO NF), Ho Cheol Shin(KHNP CRI)
- P04E16 Evaluation of Rod Bow Augmentation Factor for PLUS7 Fuel of APR1400 Plant  
Dong Chul Jung, Jin Sun Kim, Hyo Je Cho, HanBit Noh, and Do Ik Chang(KEPCO NF)
- P04E17 Thermal Conductivity Analysis of U-Mo/Al Dispersion Fuel Using FEM Simulation  
Tae Won Cho, Yong Jin Jeong, Kyu Hong Lee, Sung Hwan Kim, Ki Nam Kim, and Jong Man Park(KAERI), Dong-Seong Sohn(UNIST)
- P04E18 Axisymmetric Finite Element Analysis Code for Predicting Cladding Large Deformation at High Temperature and Its Validation  
Jinsu Kim(KAIST), Dong-Hyun Kim, Sung-Uk Lee, and Hyochan Kim(KAERI), Jeong Whan Yoon(Deakin Univ.)
- P04E19 Plus7 Fuel Rod Heat Transfer Analysis  
byungchun HWANG, erick wasonga MAKLAGO, and Ihn NAMGUNG(KINGS)
- P04E20 Test Method for the Analysis of High Temperature Oxidation Behavior of Fuel Cladding in High Pressure Steam Environments  
Sung-yong Lee, Hun Jang, Dae-gyun Ko, Yoon-ho Kim, and Seung-jae Lee(KEPCO NF)
- P04E21 Hydraulic Test for Performance Verification of Power Ramp Testing Technology to be Applied in HANARO  
Seongwoo Yang, Seungjae Park, and Keenam Choo(KAERI)
- P04E22 High Temperature Oxidation Behavior of Cr Layer Coated on Zr Fuel Cladding Using Arc Ion Plating Technique  
Dong Jun Park, Yang Il Jung, Jung Hwan Park, Byoung Kwon Choi, Young Ho Lee, Il Hyun Kim, and Hyun Gil Kim(KAERI)
- P04E23 Concept of Evaluation Method of Fuel Rod Wear by Debris  
Oh Joon Kwon, Joon Kyoo Park, Jin Seon Kim, Kyong Bo Eom, and Seung Jae Lee(KEPCO NF)
- P04E24 Development of Hydride Reorientation Fraction Evaluation Program  
Jinho Jeong and Yongdeog Kim(KHNP CRI)
- P04E25 Experimental Validation of High Temperature 3D-DIC System for Full-Field Strain Measurement of Ballooned Clad Tube  
Dong-Hyun Kim, Hyochan Kim, Chan Lee, and Sung uk Lee(KAERI), Hak-Sung Kim(HYU)
- P04E26 Preliminary Evaluation of Clad Ballooning Test with Multi-Dimensional Entire Rod Analysis Module  
Sung-Uk Lee and Hyo-Chan Kim(KAERI), JinSu Kim and Jeong Whan Yoon(KAIST)
- P04E27 Autoclave Washout Test to Simulate Exposure of the UO<sub>2</sub> Pellets under PWR Conditions  
Tae-Sik Jung, Yeon-Su Na, Min-Jae Ju, Jung-Beom Kim, Kwang-Young Lim, and Seung-Jae Lee(KEPCO NF)
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- P04E28 Initial Oxidation Behavior of a Commercial FeCrAl-based Alloy Under 1200°C Steam Environment  
Dayu Fajrul Falaakh, Sungyu Kim, and Chi Bum Bahn(PNU), Young-Jin Kim(FNC Tech.)
- P04E29 Effect of Processing Conditions on the Formation of ODS Layer on Zr-based Tubes  
Yang-Il Jung and Hyun-Gil Kim(KAERI), Hun Jang, Yoon-Ho Kim, and Seung-Jae Lee(KEPCO NF)
- P04E30 On the Method to Obtain the Effective Elastic Modulus of Non-homogeneous ATF Cladding Materials  
Hyung-Kyu Kim, Young-Ho Lee, Il-Hyun Kim, Hyun-Gil Kim, and Yang-Il Jung(KAERI)
- P04E31 Corrosion Behavior of Cr Alloy Coating Deposited by DC Magnetron Sputtering on Zircaloy-4  
Jung-Hwan Park, Yang-Il Jung, Dong-Jun Park, Hyun-Gil Kim, Byoung-Kwon Choi, and Young-Ho Lee (KAERI)
- P04E32 Development of Atomized Powder Fabrication Technology for High Uranium Density LEU Dispersion Targets  
Jonghwan Kim and Jonghyeon Lee(CNU), Kinam Kim, Kyuhong Lee, Yongjin Jeong, Sunghwan Kim, Jongman Park, and Jaejun Hwang(KAERI)
- P04E33 Development of Environment Barrier Coating for Fuel Cladding Application  
Jung Ho Shin, Daejong Kim, Hyun-Geun Lee, Ji Yeon Park, and Weon-Ju Kim(KAERI)

## 4F

### 원자력재료 (Nuclear Materials) – POSTER

5. 23. (목)  
– 24. (금)

| 좌장 김민철(Min Chul Kim), 안상준(Sangjoon Ahn)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P04F01 Development of Transverse Tensile Testing Procedure of Pressure Tube in Hot Cell  
Y. G. Jin, G. S. Heo, and Y. M. Jung(KAERI)
- P04F02 Characteristics of Eddy Current Signals from Magnetite Scale and Carbon Steel Loose Part on Secondary Side of Steam Generator Tubes  
Deok-Hyun LEE, Myung-Sik CHO, Ga-Hyun CHOI, and Kyung-Mo KIM(KAERI)
- P04F03 Control of pH and Its Effect on Electrochemical Behavior and Corrosion Product Release of Materials in PWR Primary Water Chemistry System  
Hee Kwon Ku and Jae Seon Cho(FNC Tech.), Chang Kyu Chung, One Yoo, and Jong Soo Kim(KEPCO E&C)
- P04F04 Evaluation of the Effect of Asymmetric Flow on Pipe Thinning  
Jong Yeon Lee, Eun Hee Lee, Kyung Mo Kim, Se Beom Oh, Yong Moo Choeng, and Dong Jin Kim(KAERI)
- P04F05 Development of Electrolytic Hydriding System for Hotcell Testing  
Young-Jun Kim, Seung-Je Baik, Boung-Ok Yoo, and Ki-Soo Heo(KAERI)
- P04F06 Development of Specimen Traceability Technology in Hot Cell  
Yunmock Jung, Seungje Baik, Gilsoo Kim, and Younggwang Jin(KAERI)
- P04F07 Predictability of Tensile Properties of RPV Steels in KSNPP using Standardization Small Punch Test Method  
Seokmin Hong, Tae-Kyung Lee, Jongmin Kim, Jun-Yeop Kwon, and Min-Chul Kim(KAERI)
- P04F08 Estimation of DBTT of RPV Steels in KSNPP using Standardization Small Punch Test  
Tae kyoung Lee, Seokmin Hong, Jongmin Kim, and Min-Chul Kim(KAERI), Jae-il Jang(HYU)
- P04F09 Static Structural and Transient Thermal Analysis of APR1400 Reactor Pressure Vessel  
Erick Wasonga MAKLAGO, Ihn NAMGUNG, and Byung Chun HWANG(KINGS)
- P04F10 Experimental Study of Zry-4 Air Oxidation Breakaway: Various Air Flow Rate Condition at 900-1100°C  
Gippeum Kim and Jae Young Lee(HGU)
- P04F11 Development of Wire Electric Discharge Machine in Hot Cell  
Kisoo Heo, Gilsoo Kim, Boungok Yoo, Euiyoung Kim, and Younggwang Jin(KAERI)

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- P04F12    **Measurement of Wall Thinning in the Insulated Pipe using PEC and UT**  
yela Park, Kyung Mo Kim, and Duck-Gun Park(KAERI ), Jeong Woo Shin(AIPIT), Derac Son(HNU)
- P04F13    **Ni Plating System Design for Repair of Damaged Area of RPV**  
Min Su Kim, Seong Sik Hwang, Dong Jin Kim, and Eun Hee Lee(KAERI), Dong Bok Lee(SKKU)
- P04F14    **Wear Properties of Additively Manufactured Stainless Steels for Nuclear Components**  
Junhyun Kwon, Jung-Min Kim, and Hyung-Ha Jin(KAERI)
- P04F15    **Influence of Surface Conditions on Primary Water Stress Corrosion Cracking of Alloy 600**  
Dong Woog Ha, Yun Soo Lim, and Dong Jin Kim(KAERI), Chang Yeol Jeong(DU)
- P04F16    **Multilayer Sensitivity Analysis for a New Metal Hydride Shielding Material**  
Boravy Muth and Chang Je Park(Sejong Univ.)
- P04F17    **Effect of Ni-foil Interlayer on Diffusion Bonding of Austenitic Stainless Steels**  
Ji-Hwan Cha, Sung Hwan Kim, and Changheui Jang(KAIST)
- P04F18    **Effects of Austenite Grain Size on Tensile and Charpy Impact Properties in SA508 Gr.1A Low Alloy Steel**  
Se-Mi Hyun, Seokmin Hong, and Min-Chul Kim(KAERI), Hong-Deok Kim(KHNP), Sunlg Hong(CNU)
- P04F19    **Evaluation of Corrosion Behaviors of Carbon Steel for Containment Liner Plate According to Environmental Factors**  
Won-Jun Choi and Chi Bum Bahn(PNU)
- P04F20    **Changes in Microstructure and Mechanical Properties of SA508 Gr.1A Low Alloy Steels with Variation of Cooling Rate**  
Min-Chul Kim, Seokmin Hong, and Kwon-Jae Choi(KAERI), Yoseob Lee and Maan Won Kim(KHNP CRI)
- P04F21    **Estimation of IASCC Initiation Susceptibility of Proton-irradiated Stainless Steels by IG Cracks Analysis on Irradiated Cross-sectional Area**  
Ju-Eun Park, Dong-Jin Kim, and Min-Jae Choi(KAERI), Dong-Bok Lee(SKKU)

## 5A

5. 23 (목)

## 원자력 열수력 현안 (Thermal-Hydraulic Issues)

| 좌장 신안동(An Dong Shin), 이태범(Tae Beom Lee)

| 발표장소 303A

- 09:00 Assessment of RANS Turbulence Models for Turbulence-Induced Secondary Flows  
Jungwoo Kim and Hyuntae Jo(SEOULTEC)
- 09:20 Investigation on Clearance of the Upper Downcomer during ATLAS Test for DVI Line Break  
Byoung-Uhn Bae, Jae-Bong Lee, Yu-Sun Park, Jong-Rok Kim, Seok Cho, Nam-Hyun Choi, and  
Kyoung-Ho Kang(KAERI)
- 09:40 Investigation of Flow Transient CHF for Narrow Rectangular Channel under Downward Flow Condition  
Huiyung Kim and Byongjo Yun(PNU)
- 10:00 Influence of Fuel Relocation to LOCA Safety Analysis  
Joosuk Lee and Kyunglok Baek(KINS)
- 10:20 Test Result for Simulation of a Loss of Residual Heat Removal System Accident during a Mid-Loop  
Operation in ATLAS Facility  
Jae Bong Lee, Jongrok Kim, ByoungUhn Bae, Yusun Park, Seok Cho, Nam Hyun Choi, and  
Kyoung-Ho Kang(KAERI)
- 10:40 Coffee Break
- 11:00 Long Term Cooling Performance Evaluation of a Passive Air Cooling System  
Tae-Soon Kwon(KAERI), Seong-Su Jeon(FNC Tech.)
- 11:20 Major Results from Integral Effect Tests using SMART-ITL for SMART Pre-Project Engineering  
Hyun-Sik Park, Hwang Bae, Sung-Uk Ryu, Jin-Hwa Yang, Byong-Guk Jeon, Sunil Lee, Yoon-Gon Bang,  
Chan-Jong Seo, and Sung-Jae Yi (KAERI)
- 11:40 Visualization on Turbulent Flow Structure in 19-Pin SFR Wire-wrapped Fuel Bundle: Preliminary Analysis  
Minseop Song and Eungsoo Kim(SNU), Jaeho Jeong(KAERI)

## 5B

5. 24 (금)

## 원자력 열수력 실험 A (Reactor Safety Experiments)

| 좌장 박현식(Hyun-Sik Park), 이연건(Yeon Gun Lee)

| 발표장소 303A

- 09:00 Condensation Heat Transfer on a Vertical Tube with Non-Condensable Gas  
Sang Gyu Lim, Seung Min Ohk, Jae Min Lee, Jong Cheon, Sang Won Lee, and Han Gon Kim(KHNP CRI)
- 09:20 The Experimental Study of Condensation with Non-Condensable Gas for an Inclined Tube  
Seung-Min Ohk, Sang-Gyu Lim, Jae-Min Lee, Jong Cheon, and Sang-Won Lee(KHNP CRI)
- 09:40 Preliminary Assessment of Steam Chugging Phenomena in a Vent Pipe using MARS Code  
Soon-Joon HONG, Seong-Su JEON, Je-Hee LEE, and Bub-Dong CHUNG(FNC Tech.)
- 10:00 Reactor Vessel Heating by the Natural Convection of the Melted Core in Three-Layer Configuration  
Ji-Won Bae and Bum-Jin Chung(KHU)
- 10:20 Experimental Study on the Steam Line Break (SLB) with the Multiple Steam Generator Tube Rupture (MSGTR)  
Yusun PARK, Byoung Uhn Bae, Jongrok Kim, Jae Bong Lee, Hae Min Park, Nam Hyun Choi, Kyoung Ho Kang,  
and Kyung Doo Kim(KAERI)



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- 10:40 Coffee Break
  - 11:00 Comparison of Natural Circulation Test Results with SMART-ITL: CLOF and FBL  
Jin-Hwa Yang, Hwang Bae, Sung-Uk Ryu, Byong Guk Jeon, Sung-Jae Yi, and Hyun-Sik Park(KAERI)
  - 11:20 Effect of Rolling Motion on Pool Boiling Critical Heat Flux (CHF)  
Elvira F. Tanjung, Samah A Albdour, Faraz Aziz, and Daeseong Jo(KNU)
  - 11:40 Delayed Growth of Dry Area with CHF Enhancement on Oxidized Cr-Nanostructured Surfaces  
Namgook Kim, Hong Hyun Son, and Sung Joong Kim(HYU)
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## 5C 5. 24 (금)

### 원자력 열수력 실험 B (Thermal Hydraulics Fundamental Experiments)

| 좌장 홍순준(Soon Joon, Hong), 김응수(Eung Soo Kim)

| 발표장소 303A

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- 13:30 A Simulation of Condensation Heat Transfer Coefficient of a Vertical Single Tube in Down-scaled Experiment Model using GOTHIC Code  
Jaemin Lee, Sang-Gyu Lim, Sang-Won Lee, Jong Cheon, and Seung-Min Ohk(KHNP CRI)
  - 13:50 Spatial Resolution Enhancement of PIV Velocity Field using Optical Flow  
Jee Hyun Seong(MIT), Min Seop Song and Eung Soo Kim(SNU), Daniel Numez and Annalisa Manera(UM)
  - 14:10 Measurement of Local Droplet Parameters using Single Optical Fiber Probe  
Byeonggeon Bae, Taeho Kim, Jae Jun Jeong, and Byongjo Yun(PNU), Kyungdoo Kim(KAERI)
  - 14:30 Observation of Flow Regime from Bubbly to Jet Flow in the Air Injection Experiment  
Jongwoong Yoon and Yong Hoon Jeong(KAIST)
  - 14:50 Dryout Heat Flux (DHF) Experiments of Debris Bed using a Hydrogen Evolving Method  
Je-Young Moon and Bum-Jin Chung(KHU)
  - 15:10 An experimental Study of Flow Boiling on Downward-Facing Inclined Wall with Various Inclination Angle  
Taehyeong Jin and Hyungdae Kim(KHU)
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## 5D 5. 23 (목)

### 열수력해석 I (Thermal Hydraulics Analysis I)

| 좌장 김응수(Eung Soo Kim), 이정익(Jeong Ik Lee)

| 발표장소 303B

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- 09:00 Prediction of Steam Generator Tube Gap Velocities During Feedwater Blowdownr  
Jong Chull Jo and Jongkap Kim(KINS), Jae Jun Jeong and Byong-Jo Yun(PNU), Frederick J. Moody(GE(Retired))
  - 09:20 Single Bubble Simulation in Linear Shear Flow Using Smoothed Particle Hydrodynamics: Preliminary Results  
Yelyn Ahn, Young Beom Jo, So-Hyun Park, Jin Woo Kim, and Eung Soo Kim(SNU)
  - 09:40 Multi-GPU Parallelization on SOPHIA Code for Large Scale Simulation and Preliminary Analysis  
So-Hyun Park, Young Beom Jo, and Eung Soo Kim(SNU), Yong-Woo Sim, Dong Jo Ha, and Dong-Hak Lee(CoCoLink)
  - 10:00 Numerical Simulation on LMR Molten-Core Sloshing Behaviors Using Smoothed Particle Hydrodynamics Method  
Young Beom Jo, Juryong Park, and Eung Soo Kim(SNU)
  - 10:20 Improvement of Dynamic Motion Model in MARS-KS for Downcomer Modeling of a Maritime Reactor with Cross-junction Connection  
Hee-Kwan Beom, Jang-Won Im, Geon-Woo Kim, Goon-Cherl Park, and Hyoung Kyu Cho(SNU)
  - 10:40 Coffee Break
  - 11:00 CFD Analysis of Flow Distribution in Containment during LOCA and its Comparison with GOTHIC  
Jehee Lee, Yeon Jun Choo, HeeDong Kim, and Soon-Joon Hong(FNC Tech.)
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- 11:20 Numerical Prediction of PCCS Heat Removal Performance  
Yeonjun Choo, Soonjoon Hong, and Heedong Kim(FNC Tech.), Sangwon Lee and Huiun Ha(KHNP CRI)
- 11:40 Analysis of Heat Pipe Safety System of Hybrid Micro Modular Reactor (H-MMR)  
Young Jae Choi, Jangsik Moon, and Yong Hoon Jeong(KAIST)

## 5E 5. 24 (금)

### 열수력해석 II (Thermal Hydraulics Analysis II)

I 좌장 이규천(Gyu Cheon Lee), 최동수(Tong Soo Choi)

I 발표장소 303B

- 09:00 Assessment of Subcooled Nucleate Boiling Models for Sub-channel Analysis of the PSBT Experiment using SPACE Code  
Byung-Hyun You, Kyung Doo Kim, Kwi-Seok Ha, Sung Won Bae, Jong Hyuk Lee, and Seung Hyun Yoon(KAERI)
- 09:20 An Application of CUPID Reactor Vessel Module to a Three-Dimensional PWR LBLOCA Simulation  
Ik Kyu Park, Han Young Yoon, Seung Jun Lee, Yun Cho, and Jae Ryong Lee(KAERI)
- 09:40 Assessment of Three-Dimensional Effect on Reactor Fuel Assembly Simulation using CUPID and MARS-KS Codes  
Yun Je Cho, Han Young Yoon, Ik Kyu Park, Seung Jun Lee, and Jae Ryong Lee(KAERI)
- 10:00 System Code Analysis of ATLAS Facility Including Heat Loss Evaluation  
Seong-Su Jeon, Bicer Erol, Jae-Ho Bae, and Soon-Joon Hong(FNC Tech.), Byoung-Uhn Bae and Kyoung-Ho Kang(KAERI)
- 10:20 Improvement of Offtake Models for 1-D System Analysis Codes  
Jaeseok Heo, Kyung Doo Kim, and Kwi-Seok Ha(KAERI)
- 10:40 Coffee Break
- 11:00 Modification of Horizontal Stratified Criteria Using Kelvin-Helmholtz Instability in SPACE Code  
Jong Hyuk Lee and Kyung Doo Kim(KAERI), Byoung Jae Kim(CNU)
- 11:20 LBLOCA Analysis Methodology for New Acceptance Criteria  
Dongkyu Lee, Tongsoo Choi, Kayeol Rew, and Hyunggun Sung(KEPCO NF), Seokho Lee(KHNP CRI)
- 11:40 Comparisons of Wall Heat Transfer Models Implemented in US TRACE and Korean MARS-KS System TH Codes  
Sung Gil Shin and Jeong Ik Lee(KAIST)

## 5F 5. 24 (금)

### 열수력해석 III (Thermal Hydraulics Analysis III)

I 좌장 이승욱(Seung Wook Lee), 이재룡(Jae Ryong Lee)

I 발표장소 303B

- 13:30 Experiments of Condensation Heat Transfer in a Vertical Tube with Non-Condensable Gas  
Taehwan Ahn, Jinhoon Kang, Jae Jun Jeong, and Byongjo Yun(PNU)
- 13:50 Assessment of SPACE for FLECHT-SEASET Reflood Experiments using Criterion for Minimum Film Boiling Point based on Wall Temperature at Node Interface  
Seung Hyun Yoon, Kyung Doo Kim, Kwiseok Ha, Jong Hyuk Lee, Jaeseok Heo, and Byung-Hyun You(KAERI)
- 14:10 Thermal Hydraulics Analyses on the Core of HTR-10 in Steady State and Transient Conditions using Fluent 6.3 3-Dimensional Model for Indonesian RDE Design Development  
Edward Steven Sembiring and Alexander Agung(DNEEP UGM), Muhammad Subekti(CNRST BATAN)
- 14:30 Uncertainty Quantification for Station Blackout Scenario  
Joao Ricardo Tavares de Sousa and Aya Diab(KINGS)

- 14:50 CHF Prediction Evaluation for START Sub-channel Code  
Khurum Saleem Chaudri and Yonghee Kim(KAIST), SungJoong Kim(HYU)
- 15:10 Numerical Assessment of the RVCS Model Developed by the Scaling Analysis using MARS-KS Code  
Koung Moon Kim and Ho Seon Ahn(INU), Ji-Hwan Hwang and Dong-Wook Jerng(CAU)

## 5G 5. 23. (목) - 24. (금)

### 원자력 열수력 실험 C (Thermal Hydraulics Fundamental and Safety Experiments) – POSTER

| 좌장 김병재(Byoungjae Kim), 허병길(Byung-Gil Huh) | 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P05G01 Reflux Condensation in SBLOCA Tests of ATLAS Facility  
Yeon-Sik KIM, Ki-Yong Choi, Kyoung-Ho Kang, Byoung-Uhn Bae, Nam-Hyun Choi, Kyoung-Ho Min, and Jong-Kuk Park(KAERI)
- P05G02 Measurement of Local Bubble Parameters with Optical Fibers along a Vertical Annulus  
Il Woong Park and Yeon-Gun Lee(JNU)
- P05G03 Preliminary Analysis of Experiment for Thermo-Mechanical and Hydraulic Behaviour during LOCA  
Dongjin Euh, Jongrok Kim, and Sangki Moon(KAERI)
- P05G04 Prediction of Local CHF Variation along a 10 degree Inclined Large Surface Facing Downward  
Uiju Jeong(KHNP CRI), Sung Joong Kim(HYU)
- P05G05 Heat Transfer Characteristic of Deep Eutectic Solvent  
Jae-young Lee and Ji-young Yoon(HGU)
- P05G06 Natural Convection Heat Transfer of Oxide Layer in the Two-layer Configuration and Three-Layer Configuration  
Su-Hyeon Kim(KAERI), Bum-Jin Chung(KHU)
- P05G07 Effects of Air Injection on Condensation-Induced Pressure Shock and Critical Heat Flux of Inclined Downward-Facing Heater  
Jae Hyung Park, Taeseok Kim, Jong Hoon Han, and Sung Joong Kim(HYU)
- P05G08 Heat Transfer Experiment with PureTemp58X for Passive Containment Cooling Application  
Jai Oan Cho, Jaehyung Sim, and Jeong Ik Lee(KAIST)
- P05G09 Experimental Assessment on Main Flow Path and Heat Loss of SMART-ITL Facility during Specific Steady-State Conditions  
Hwang Bae, Sung Uk Ryu, Byoung-Guk Jeon, Jin-Hwa Yang, Yong-Cheol Shin, Kyoung-Ho Min, Jong-Kuk Park, Nam-Hyun Choi, Yun-Gun Baeng, Chan-Jong Seo, Sung-Jae Yi, and Hyun-Sik Park(KAERI)
- P05G10 Experimental Study on the Cooling Performance of a Rod Type Heat Pipe for Passive Cooling System  
Jonghwi Choi and Hyunsik Park(KAERI), Sangmin Park and Hyungdae Kim(KHU)

## 5H

5. 23. (목)  
- 24. (금)

### 열수력 해석 (TH Analysis) – POSTER

| 좌장 신안동(An Dong Shin), 조윤제(Yun Je Cho)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

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|--------|--|
| P05H01 | CFD Simulation of Cavitation Flow inside a Square-Edged Orifice using ANSYS CFX<br>Gong Hee Lee and Jun Ho Bae(KINS)   |
| P05H02 | Plant Application of SPACE-mTRAN Coupled Code System<br>Seung Wook Lee, Hyo Chan Kim, Yong Sik Yang, and Kyung-Doo Kim(KAERI), Jin-Hyuk Hong(EDT)  |
| P05H03 | Sensitivity Analysis of Operator Recovery Actions for Multiple Steam Generator Tube Rupture Event in OPR1000<br>MinJeong Kim(KHNP CRI)   |
| P05H04 | Evaluation of Sensitivity Study on the Reactor Power Effect for Complete Flow Blockages of Plate-type Fuel Assembly<br>Jong-Pil Park(KAERI)  |
| P05H05 | Extension of the SPACE Code Capability into Thermal-Hydraulic Analysis for Ocean Nuclear Reactor<br>Byoung Jae Kim and Young Seock An(CNU), Seung Wook Lee(KAERI)  |
| P05H06 | Numerical Demonstration of an Unmanned Reactor Based on Passive Infinite Cooling System<br>Byoung Jae Kim and Nam Kyu Ryu(CNU), Sung Jae Yi(KAERI)   |
| P05H07 | CFD Analysis of Steam Flow at TI-SGTR Accident Induced by MSSV Stuck-Open Faults<br>Wung Jae Wang and Man Sung Yim(KAIST)  |
| P05H08 | Model Development for Condensate Collection from Passive Containment Cooling System and Return to In-Containment Refueling Water Storage Tank<br>Jin Chul Kang, Jong ho Kim, and Jae sik Jeung(KEPCO E&C)        |
| P05H09 | Void Fraction Predictability of System Codes Based on PSBT Bundle Test<br>Yunseok Lee, Yeongjae Lee, and Taewan Kim(INU)   |
| P05H10 | Computational Analysis of Wall Condensation in the Presence of Non-condensable Gas Mixture Containing a Light Gas with CUPID<br>Chang Won Lee and Hyoung Kyu Cho(SNU)  |
| P05H11 | Preliminary Assessment of SPACE Code for Loss of Ultimate Heat Sink in OPR1000<br>Doo-hyuk Kang and Jae-seung Suh(SENTECH)   |
| P05H12 | Application of Adjoint Based Node Optimization Method to MARS<br>Jae Jun Lee, Min-Gil Kim, Seongmin Son, and Jeong Ik Lee(KAIST)   |
| P05H13 | Coupling of FLUENT and ANLHTP for Steady-state Thermal Analysis of a Heat Pipe Cooled Reactor Core<br>San Lee and Hyoung Kyu Cho(SNU), Changho Lee and Taek K. Kim(ANL)  |
| P05H14 | Preliminary Study of the Artificial Neural Networks to Replace the Constitutive Equations in the Reactor Safety Analysis Code<br>ChoHwan Oh, Sung Gil Shin, Seongmin Son, Doh Hyeon Kim, and Jeong Ik Lee(KAIST) |
| P05H15 | Preliminary Calculation of SGTR with HPSI Failure in OPR1000 using SPACE Code<br>Dong-ha Lee, Yeon-sik Cho, and Jae-seung Suh(SENTECH)   |
| P05H16 | Sensitivity Analysis of Reflood Model with RBHT Experiment<br>Wonwoong Lee and Jeong Ik Lee(KAIST)   |
| P05H17 | Preliminary Study on Modified Steam Turbine Modeling of the MARS-KS Code<br>Doh Hyeon Kim, Jae Jun Lee, Jeong Yeol Baek, Yonghee Kim, and Jeong Ik Lee(KAIST)  |

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- P05H18 Thermal-Hydraulic Analysis of MSGTR Event in OPR1000 using SPACE Code  
Jae-ho Bae, Yeon-sik Cho, and Jae-seung Suh(SENTECH)
- P05H19 Preliminary Study of Correlation between Variables in Sensitivity Analysis of PWR Safety Analysis  
Min-Gil Kim and Jeong Ik Lee(KAIST)
- P05H20 Preliminary Multi-Physics Analysis of OPR1000 Reactor Core using Coupled CUPID and nTER  
Youyeon Choi and Hyoung Kyu Cho(SNU), Jin Young Cho(KAERI)
- P05H21 Design Study of Heat Pipes for Nuclear Spaceship Applications  
Ye Yeong Park, YeongShin Jeong, and In Cheol Bang(UNIST)
- P05H22 Flow Characteristics of Molten Salt Natural Circulation in Non-uniform Heat Flux Condition using Open FOAM,  
Dong Hun Lee, Seok Bin Seo, Yeong Shin Jeong, and In Cheol Bang(UNIST)
- P05H23 Thermal Hydraulic Analysis of TES Integrated PWR Cycle  
Ju Yeon Lee and Jeong Ik Lee(KAIST)

## 6A

5. 23 (목)

## 최신 리스크 모델 기술 개발 (Advances in Risk Modeling Method)

I 좌장 임호곤(Ho Gon Lim), 황석원(Seok Won Hwang)

I 발표장소 202B

- 09:00 Simulator-based Time Reliability Curve for HRA of Digitalized Main Control Room  
Wondea Jung(KAERI), Eun-chan Lee(KHNP CRI)
- 09:20 Application of a PSA Tool for Accident Sequence Precursor Evaluation  
Chang-Ju Lee and Dongju Jang(KINS), Sang Hoon Han(KAERI)
- 09:40 A Preliminary Site Risk Assessment for Multi-unit Nuclear Power Plants  
Wonjong Song, Seunghyun Jang, Dohyun Lim, Yein Seo, Sunghyun Park, and Moosung Jae(HYU)
- 10:00 External Flood Risk Analysis at NPP Site Considering Climate Change  
Beomjin Kim and Kun-yeun Han(KNU), Daegi Hahm, minkyu Kim, and Junhee Park(KAERI)
- 10:20 Development of Software to Estimate Representative Surface Roughness Length in Korea  
Sung-yeop Kim, Seung-Cheol Jang, and Kwang-Il Ahn(KAERI), Seok-Won Hwang(KHNP CRI)
- 10:40 Coffee Break
- 11:00 Agent-Based Modeling Approach Evaluate Evacuation Scenarios - Human Behavior Pattern Study  
Yujeong Hwang and Gyunyoung Heo(KHU)
- 11:20 3-D Look-Up Table for Multi-Unit Accidents Assessment  
Hyunae Park, Wonjong Song, and Moosung Jae(HYU)
- 11:40 Status of SMART PPE PSA  
Jin Hee Park, Yong Hun Jung, Jae Hyun Cho, and Yoon Hwan Lee(KAERI), Jin Kyu Han(RETech)
- 12:00 Transient Analyses to Develop Event Trees of Autonomous Micro Modular Reactor  
Eun Seo So and Man Cheol Kim(CAU)

## 6B

5. 24 (금)

## 지진 리스크 평가 기술 개발 (Progress in Seismic Risk Assessment)

I 좌장 김민규(Minkyu Kim), 정우식(Woo Sik Jung)

I 발표장소 202B

- 09:00 Requirement for Seismic PSA Quantification Software under Development in KAERI  
Sang Hoon HAN, Shinyoung KWAG, Junhee PARK, and In-Kil CHOI(KAERI)
- 09:20 HCLPF Capacity against Sliding Failure of Flat-Bottom Vertical Fluid Storage Tank  
Jeongguk Song and Dongwook Kim(KEPCO E&C), Nakhyun Chun(KEPRI)
- 09:40 How to Convert Correlated Seismic Failures into Seismic CCFs  
Woo Sik Jung (Sejong Univ.)
- 10:00 Validation Study for Seismic Analysis SW COREX  
Seong Kyu Park and Koo Sam Kim(ACT Co.), Woo Sik Jung(Sejong Univ.)
- 10:20 Seismic Correlation Application Study with COREX  
Seong Kyu Park and Koo Sam Kim(ACT Co.), Woo Sik Jung(Sejong Univ.)
- 10:40 Coffee Break

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| 11:00 | Feasibility Study on a Calculation of Seismic Response Correlations Coefficient for a Nuclear Power Plant<br>Seung-Hyun Eem and In-Kil Choi(KAERI)                |
| 11:20 | Results of Multi-unit Seismic PSA in KHNP Project and Sensitivity Study on Seismic Correlation<br>Kyemin Oh, Hojun Jeon, and Jeong Seon Park(KHNP CRI)            |
| 11:40 | Parameter Identification of Structures under Earthquake Excitations Using Adaptive Particle Filter and Ensemble Learning Method<br>Minkyu Kim and Junho Song(SNU) |
| 12:00 | Bayesian Network for Structures Subjected to Sequence of Main and Aftershocks<br>Changuk Mun and Junho Song(SNU)  |
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<b>6C</b> 5. 24 (금)	<b>신뢰도 자료 생성 방법 개발 (Advances in Reliability Data Generation)</b>   좌장 박진균(Jinkyun Park), 김만철(Man Cheol Kim)   발표장소 202B
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| 13:30 | Failure Estimation of Pressurized Carbon Steel Pipe Tee Junction by Experimental and Numerical Study<br>Da-Woon Yun, Bub-Gyu Jeon, and Sung-Wan Kim(PNU), Min-Kyu Kim(KAERI)                                 |
| 13:50 | An Analysis of Economic Factors for Level 3 PSA<br>Yein Seo, Mina Cho, Yerim Park, and Moosung Jae(HYU)  |
| 14:10 | A Framework for the Dynamic Extension and Fast Progression Analysis of Accident Scenarios Using a Deep Learning Technique<br>Jinkyun Park and Hyeonmin Kim(KAERI)  |
| 14:30 | Copula Study for Common Cause Failures under Asymmetric Conditions<br>Kyungho Jin and Gyunyoung Heo(KHU)   |
| 14:50 | A Study on CCF Parameters Using Joint Probability Distribution<br>Kibeom Son and Gyunyoung Heo(KHU)  |
| 15:10 | Coffee Break   |
| 15:30 | The Impact of Atmospheric Dispersion Coefficients of Off-Site Consequence Analysis Codes on Atmospheric Dispersion Factors<br>Hye Rin Lee, Gee Man Lee, and Woo Sik Jung(Sejong Univ.), Seok Jung Han(KAERI) |
| 15:50 | Evaluation of HEPs to FLEX Strategies in Response to APR1400 Extended SBO for Risk-Informed Decision Making<br>Jong-hoon Park, Joo-il Park, Hyo-sun Ryu, Jonathan Amfoh Blankson, and Hak-kyu Lim(KINGS)     |
| 16:10 | The Generation of Failure Surface for Reliability Assessment of Passive Safety Systems using Deep Learning Technology<br>Hyeonmin Kim, Jaehyun Cho, Jae Young Yoon, and Jinkyun Park(KAERI)                  |
| 16:30 | Human Error Probability Estimation through Thermal-Hydraulic Simulation with Exhaustive Conditions<br>Jaehyun Cho, Yochan Kim, Jaewhan Kim, Jinkyun Park, and Dong-San Kim(KAERI)                            |
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<b>6D</b> 5. 23 (목)	<b>최신 중대사고 실험 연구 (Advances in Experimental Severe Accident Research)</b>   좌장 김성일(Sung Il Kim), 박진호(Jin Ho Park)   발표장소 203
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| 09:00 | Development of Test Facility for Aerosol Removal in Pipe<br>Doo Yong Lee, Woo Young Jung, Hyun Chul Lee, Ji Seok Kim, and Jae Her(FNC Tech.), Byeonghee Lee and Kwang Soon Ha(KAERI) |
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- 09:20 Feasibility Study in using Bismuth-embedded SBA-15 for Gaseous Iodine Adsorption during Nuclear Severe Accident Mitigation  
Seong Woo Kang and Man Sung Yim(KAIST)
- 09:40 Aerosol Removal Experiment in Steam Generator Simulating Tube Rupture Event  
Byeonghee Lee, Sung Il Kim, and Kwang Soon Ha(KAERI)
- 10:00 pH Effect on Generating Volatile Iodine Species in Solution  
Thi Thanh Thuy Nguyen(UST), Kwang Soon Ha, Jin Ho Song, and Sung Il Kim(KAERI)
- 10:20 Gap Formation Study for In-vessel Gap Cooling  
Moon Won Song and Hee Cheon NO(KAIST)
- 10:40 Coffee Break
- 11:00 Modified Rosin-Rammler Distribution for Debris Particle Size: Effect of Minimum Particle Size on DHF  
Woo Hyun Jung, Mooneon Lee, Hyun Sun Park, and Moo Hwan Kim(POSTECH)
- 11:20 Preliminary Analysis of Pressure Gradient for Two-Phase Flow and Dryout Heat Flux through Beds Composed of Debris Resulted from TROI Tests  
Jin Ho Park, Sang Mo An, Jaehoon Jung, and Seong-Wan Hong(KAERI)
- 11:40 Characteristics of the Natural Circulation of the Pool under RVACS Condition in Pool-type LMR using 2-D Slab Experiment  
Minho Lee and In Cheol Bang(UNIST), Dong Wook Jerng(CAU)
- 12:00 Steam Removal Phenomenon Inside the Containment of Nuclear Power Plants using Silica Gel Considering Initial Steam Partial Pressure Conditions Up to a Design Limit  
Dong Hoon Kam and Yong Hoon Jeong(KAIST)
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## 6E 5. 24 (금)

### 중대사고와 확률론적안전성평가 분야간 연계 방안

### (Harmonization between Severe Accident Analysis and Probabilistic Safety Assessment)

| 좌장 김동하(Dong Ha Kim), 안광일(Kwang Il Ahn)

| 발표장소 203

#### 초청발표

- 09:00 The Fukushima Accident - Past, Present and Future  
JinHo Song(KAERI)
- 09:40 Phenomena Identification and Ranking Tables for Inter-System Loss of Coolant Accident  
Kwang Soon Ha, Byeonghee Lee, Jin Ho Song, Sung Il Kim, Yong Mann Song, and Youngsu Na(KAERI)
- 10:00 Human Reliability Analysis for Level 2 PSA: Qualitative Information Analysis of Severe Accident Management Guidelines under Postulated Accident Scenarios  
Jaewhan Kim and Jaehyun Cho(KAERI), Keo-hyoung Lee(FNC Tech.)
- 10:20 How to Estimate the Effect of Inter-Unit Release of Radioactive Materials in Multi-Unit Site  
Jae Young Yoon and Dong-San Kim(KAERI)
- 10:40 Coffee Break
- 11:00 An Assessment of Fission Product Release Mitigation by CFVS at ECF using MELCOR 2.2  
Seungwoo Kim, Dohyun Lim, Youngho Jin, Dongha Kim, and Moosung Jae(HYU)
- 11:20 An Evaluation of Severe Accident Management Strategy Using PORVs in SGTR Accident  
Hoyoung Shin, Yerim Park, Youngho Jin, Dong-Ha Kim, and Moosung Jae(HYU)
- 11:40 Computer Code ROSHNI's Predictions of CANDU Severe Accident Progression and Its Confirmation of Severity of Reactor Design Omissions, Source Term Vulnerabilities and Avoidable Risks  
Sunil Nijhawan(Prolet Inc)
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## 6F

5. 24 (금)

### 최신 중대사고 안전해석 연구 (Advances in Severe Accident Safety Analysis)

| 좌장 김성중(Sung Joong Kim), 정재훈(Jaehoon Jung)

| 발표장소 203

- 13:30 Evaluation of Improved Fission Product DFs Model in MAAP-ISAAC 4.03 Code during MSGTR Accident  
Chul-Kyu Lim, Sook-Kwan Kim, and Sang-Koo Han(ACT Co.), Kwang-Il Ahn(KAERI), Seok-Won Hwang(KHNP CRI),  
Chan-Young Paik(FAI)
- 13:50 Current Status of a Module for Iodine Behavior in Containment  
Jaehoon Jung, Kwang soon Ha, and Sung Il Kim(KAERI)
- 14:10 Decontamination Factor Prediction Using Artificial Neural Networks Method  
Seongmin Lee and Yong Hoon Jeong(KAIST)
- 14:30 Analyses of Fission Product Retention under ISLOCA using MELCOR for APR1400  
Keo-hyoung Lee(FNC Tech.), Kwang-il Ahn(KAERI), Seok-won Hwang(KHNP CRI)
- 14:50 Computational Study of Lean Limit Flames in Hydrogen Mixtures to Investigate Flame Propagation  
Characteristics  
Joongoo Jeon, Yeon Soo Kim, Hoicul Jung, and Sung Joong Kim(HYU)
- 15:10 Coffee Break
- 15:30 Three-Dimensional Numerical Study on Hydrogen Behavior in CANDU Reactor Building in a Severe  
Accident  
Taehyub Hong and Jong Wook Go( KHNP)
- 15:50 Potential Safety Benefit of Oxidation-Resistant CrAl Coated Zr Cladding Under Severe Accidents such as  
TMI and SBO Conditions  
T.H. CHUN, C.H. SHIN, and J.H. YANG(KAERI)
- 16:10 Studies on the Effect of Steam Generator Geometry on C-SGTR Accident  
Sung Il Kim, Eun Hyun Ryu, Hyung Seok Kang, Byeong Hee Lee, and Kwang Soon Ha(KAERI)
- 16:30 Analyses of Severe Accident Progression According to Break Areas in SBLOCAs of SMART  
Hyung Seok Kang, Donggun Son, and Rae-Joon Park(KAERI)

## 6G

5. 23 (목)

### 원자력 안전현안과 화재방호 (Safety Issue and Fire Protection)

| 좌장 이일석(II S. Lee), 강대일(Dae Il Kang)

| 발표장소 삼다홀A

- 09:00 Perspective to the Safety Classification of Structures, Systems and Components on the Basis of Safety  
Function and Defense-in-Depth  
Manwoong Kim and Ki-Yeon Kwon(KINS)
- 09:20 Gas Void Monitoring and Control System (GVMCS) Development for Gas Intrusion and Accumulation in  
Nuclear Power Plants  
Yong Jae Song, Jongchan Lee, Hee Kwon Ku, Woo Young Jung, and Hee Dong Kim(FNC Tech.),  
Dae Seoung Jo(KNU)
- 09:40 Debris Transport Visualization System (DTVS) Test Facility for Closing the GSI-191 (Generic Safety  
Issues) in Nuclear Power Plants  
Yong Jae Song, Jongchan Lee, Dong Seok Lim, Minbeom Heo, and Hee Dong Kim(FNC Tech.)
- 10:00 Feasibility Study about Phase Change Material (PCM) Base Self-Sealing Concept for Nuclear  
Containment Building  
Yonadan Choi and Yong Hoon Jeong(KAIST)
- 10:20 Main Control Room Safety and Dose Estimation in OPR 1000  
Seung Chan LEE(KHNP CRI)

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|-------|---|
| 10:40 | Coffee Break  |
| 11:00 | A Study on Fire HRA for Korean Nuclear Power Plants<br>Sun Yeong Choi and Dae Il Kang(KAERI)  |
| 11:20 | Comparative Studies on the Modeling Approaches of Fire-Induced Component Failure Events for a Fire Event PSA<br>Dae Il Kang and Yong Hun Jung (KAERI)   |
| 11:40 | Modeling of Heat Release Rate of Horizontal Cable Tray Fire in PRISME CFS-2<br>Yong Hun Jung and Dae Il Kang(KAERI), Dong Won Choi and Yongwhan Kim(KINS), Weon Gyu Shin and Byeongjun Kim(CNU) |
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## 6H

5. 23. (목) - 24. (금)

### 리스크평가/관리 현안 해결 기술 개발 (Emerging Issues in the Risk Assessment & Management) – POSTER

| 좌장 장승철(Seung-Cheol Jang), 권태현(Tae-Hyun Kwon) | 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

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|--------|--|
| PO6H01 | A Suggestion of Improved Evaluation Method for Human Error Probability in Fire PSA<br>hansul Lee(KHNP CRI), jaewan Park(ACT Co.,)  |
| PO6H02 | Development of Framework for Seismic PSA using 3D FE Model of NPPs<br>Tae-Hyun Kwon and In-Kil Choi(KAERI)   |
| PO6H03 | A Development of Database Management Application for Level 1 Multi-unit PSA<br>Byeongmun Ahn, Mina Cho, Seunghyun Jang, and Moosung Jae(HYU)   |
| PO6H04 | An Investigation of Quality Assurance Process to Apply a Computer Program Development of Level 3 (Off-site Consequence Analysis) Probabilistic Safety Assessment<br>Sunhee Park and Seok-Jung Han(KAERI) |
| PO6H05 | Comparison Study on Dose Estimation among Consequence Analysis Codes<br>Yongjin Kim, Seokwoo Sohn, Wonjong Song, and Moosung Jae(HYU)  |
| PO6H06 | Application Result of Methodologies for ISLOCA Frequency Reduction<br>Saehan KIM, Seokwon HWANG, and Gyemin OH(KHNP CRI)   |
| PO6H07 | Study on the Simplification of STC Combination in Multi-unit PSA<br>Kyemin Oh, Hojun Jeon, and Jeong Seon Park(KHNP CRI)   |
| PO6H08 | Determination of Conversion Factor from Radionuclides Release to Latent Cancer Fatality<br>Kiwon Song, Jaehyun Cho, Sung-yeop Kim, and Dong-San Kim(KAERI)   |
| PO6H09 | Effect of Seismic Hazard Curves on Seismic Probabilistic Safety Assessment of a NPP<br>Jeong-Seon Park, Hojun Jeon, and Kyemin Oh(KHNP CRI)  |
| PO6H10 | An Approach for Justifying Safety Margin in the Risk-Informed Integrated Decisionmaking<br>Seung-Cheol Jang(KAERI)   |
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# 6I

## 중대사고연구 (Severe Accident Research) – POSTER

5. 23. (목)  
– 24. (금)

| 좌장 김희동(Hee Dong Kim), 송진호(Jinho Song)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P06I01 Analysis for Condition of Corium Discharge from Reactor Vessel using MELCOR  
Sang Ho Kim and Sang Mo An(KAERI)
- P06I02 Proposal of Particle Size Distribution for Debris Coolability Research  
Seong-Wan HONG and Sang-Mo AN(KAERI)
- P06I03 Introduction of DEFCON Facility for Providing the Empirical Shape of Fragmented Ex-vessel Debris Bed in a Pre-flooded Reactor Cavity  
Ki Han Park, Sang Mo An, Jin Ho Park, Chang Wan Kang, and Keun Sang Choi(KAERI)
- P06I04 Similarity Experiment of Ex-vessel Debris Bed Formation in a Pre-flooded Reactor Cavity  
Sang Mo An, Jaehoon Jung, and Jin Ho Park(KAERI)
- P06I05 Void Fraction and Pressure Gradient Measurement of Two-Phase Flow in Packed Bed  
Mooneon Lee, Hyun Sun Park, Jeong Hyeon Oh, and Moo Hwan Kim(POSTECH)
- P06I06 Preliminary Analysis of Ex-vessel Debris Bed Coolability according to Bed Geometry  
Jaehoon Jung, Jin Ho Park, and Sang Mo An(KAERI)
- P06I07 Analysis of Ex-Vessel Coolability on PMCCS in iPOWER  
Do Hyun Hwang(KHNP CRI)
- P06I08 Effects of Thermal Conductivity of Corium on Molten Core Concrete Interaction  
Sang Ho Kim, Jong Hwa Park, and Rae-Joon Park(KAERI)
- P06I09 A Comparative Study of Flammability Limit Models for H<sub>2</sub>/CO Mixture on the Applicability of Severe Accident Conditions  
Kim Yeon Soo, Jeon Joongoo, Choi Wonjun, and Kim Sung Joong(HYU)
- P06I10 MELCOR Analysis of a PAR Experiment in the SPARC Test Facility  
Hyoung Tae Kim and Jongtae Kim(KAERI)
- P06I11 Room Temperature Hydrogen Oxidation and Anti-Poisoning Property of Ultra-Stable Gold Nanocatalyst for Passive Autocatalytic Recombiner System  
Shin-Hyun Kang, Tae-Hwan Kim, and Se Youn Moon(JBNU)
- P06I12 3-D Visualization of Data from Experiments and Lumped-Parameter Analyses about Containment Thermal Hydraulic Phenomena  
Jongtae Kim and Hyoung Tae Kim(KAERI)
- P06I13 A Preliminary Analysis of Fission Product Deposition Using MAAP5 Simple and Detailed Nodalization  
Hoe-Yeol Kim and Mi-Ro Seo(KHNP CRI)
- P06I14 Preliminary Validation of Modified Transition Rate Matrix for Mason Equations of Hygroscopic Growth for Coupling with Multicomponent Sectional Equations  
Yoonhee Lee, Yong Jin Cho, Kukhee Lim, and Jin-Seong Park(KINS)
- P06I15 Preliminary Analysis of Exposure Dose Fraction by Radioactive Elements for the Postulated Severe Accidents in the Shin Kori Unit-1  
Man-kyu Lee and Yu-Jung Choi(KHNP CRI)
- P06I16 Preliminary SBO Results from SMART-ppe with the ADS Venting to IRWST through ECT System and RRT using MELCOR1.8.6  
Jong-Hwa Park, Sang-Ho Kim, Sung-Il Kim, and Rae-Joon Park(KAERI)

- P06I17 Sensitivity Analysis for the Time of Containment Spray Injection based on a SBLOCA Scenario  
JongWook Go and TaeHyub Hong(KHNP CRI)
- P06I18 Analysis Method on Severe Accident Issues for SMART  
Rae-Joon Park(KAERI)
- P06I19 Introduction to Steam Generator Tube Rupture Accident Test Facility  
S. H. Hong, S. I. Kim, B. H. Lee, K. S. Ha, J. H. Jung, K. H. Park, J. H. Park, J. H. Kim, and J. Y. Oh(KAERI)
- P06I20 Severe Accident Analysis of Asymmetric FWLB inside Containment for CANDU Plant PSA Level 2  
Bong Jin Ko, Sook-Kwan Kim, and Ho-Chang Yang(ACT Co.), Kwng-II Ahn(KAERI), Seok-Won Hwang(KHNP CRI)
- P06I21 Items to Be Improved in MAAP-ISAAC Code for Best Estimate PSA Level 2  
Dong-Sik Jin, Sang-Koo Han, and Chul-Kyu Lim(ACT Co.), Kwang-II Ahn(KAERI), Seok-Won Hwang(KHNP CRI), Chan-Young Paik(FAI)
- P06I22 Level-2 PSA Sensitivity Study for Airlock Seal Failure Pressure Under Severe Accidents in CANDU-6 Plants  
YongMann SONG and JunHo BAE(KAERI), DongHa KIM(HYU)

## 6J

### 안전현안 (Safety Issues) – POSTER

5. 23. (목)  
- 24. (금)

| 좌장 이창주(Chang-Ju Lee), 최선영(Sun Young Choi)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P06J01 Analytical Study on Containment Responses Following a LBLOCA of APR1400 Reactors  
KyuHyun Han(KINS)
- P06J02 Study on the Containment External Cooling Effect for Strategy of FSG-12 using GOTHIC Code  
KYUNGHO NAM and Bum-soo Youn(KHNP CRI)
- P06J03 Regulatory Code System for DNBR Evaluation on the Asymmetric Events with High Burn-up Fuel Issues  
Il S. Lee, Dong H. Yoon, Tae H. Kim, and An D. Shin(KINS), Yong C. Kim(KU)
- P06J04 Assessment of TRACE VESSEL Component with DVI Direct Bypass Test  
Min Ki Cho, Andong Shin, and Sara Kang(KINS)
- P06J05 Current Status and Future Plans on Estimation of Human Error Probabilities of FLEX/MACST Actions  
Young A Suh and Jaewhan Kim(KAERI)
- P06J06 Periodic Safety Review of AGN-201K by Graded Approach  
Jaewon Park, Kyungjin Lee, Suhyun Hwang, Hyunju Na, and Taebin Yoon(FNC Tech.)
- P06J07 Introduction of the PECCS MAAP5 Model Developed for Preliminary PSA in the Innovative Passive Reactor  
Baehyeuk Kwon, Jaegab Kim, and Dongwook Kim(KEPCO E&C), Horim Moon(KHNP CRI)

## 7A

5. 23 (목)

## 방사선 방호 (Radiation Protection)

| 좌장 장미(Mee Jang), 강상묵(Sang Mook Kang)

| 발표장소 202A

## 초청발표

09:00

Road to Build Radiation Detector and Imager  
Wonho Lee (KU)

09:30

A New Method to Verify MCNP-calculated Thermal Neutron Fluence using TLDs and a Cadmium Sheet  
Ahmed Ibrahim Khalil Khalil, Sangmin Lee, Hyegang Chang, and Sung-Joon Ye(SNU)

09:50

Basic Considerations in Meta-analysis for DDREF Derivation  
Heechan Lee, Donghyun Lee, and Eun-Hee Kim(SNU), Seunghee Lee(FNC Tech.)

10:10

Evaluation of the Internal dose of Dismantling Workers for Bio-shield of Kori NPP unit 1  
ChoongWie Lee and Hee Reyoung Kim(UNIST)

10:30

Calculation of Skeletal Fluence-to-dose Response Functions for Korean Adults to Photon Exposures  
Bangho Shin, Chansoo Choi, Haegin Han, and Chan Hyeong Kim(HYU), Yeon Soo Yeom(NCI)

10:50

Coffee Break

11:10

Radiation Dose Assessment in Pre-Separator Room in ISOL Due to Accumulation of Rare-Isotopes  
Jae Cheon Kim and Jin Ho Lee(IFS)

11:30

Development of the Multipurpose System for Environmental Radiation Survey and Its Application to the Unmanned Aerial Vehicle  
Young-Yong Ji, Mee Jang, Kun Ho Chung, and Mun Ja Kang(KAERI), Taehyung Lim(SI Detection Co. Ltd.)

11:50

UAV-based Radiation Sensor System Optimization  
Chanki Lee, Woo Nyun Choi, and Hee Reyoung Kim(UNIST)

12:10

Identification of Factors Affecting Evacuation Time Estimates in Seismic Events  
Sunghyun Park, Seokwoo Sohn, and Moosung Jae(HYU)

## 7B

5. 23. (목)  
- 24. (금)

## 방사선 방호 (Radiation Protection) – POSTER

| 좌장 최승진(Seung Jin Choi), 김주연(Joo Yeon Kim)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

P07B01

A Review of Equilibrium Factors of Indoor Radon and Thoron for Radiation Dose Assessment  
Jae Kwon, JungHwan Jang, SeungWoo Ji, JinHo Park, and KwangPyo Kim(KHU)

P07B02

Review of Radiological Criteria for Type-IP Package  
Ki Hoon KIM, Jin O LEE, Jung Hwan JANG, Hyun Su Seo, and Kwang Pyo KIM(KHU)

P07B03

Optimization of Signal Condition for Tritium Detection  
Jun Woo Bae, Ki Joon Kang, and Hee Reyoung Kim(UNIST)

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P07B04	Radiation Sensitivity Analysis for Uranium-containing Hydrofluoric Acid Kyoungyong Noh, Hyun Sik Kang, Misuk Jang, and Seoung Rae Kim(NESS)
P07B05	Development of 4D Monte Carlo Dose Calculation Program by Using Posture-deformed Mesh Phantoms and Its Potential Application to Real-time Dose Monitoring System Haegin Han, Chansoo Choi, Bangho Shin, and Chan Hyeong Kim(HYU),Yeon Soo Yeom(NCI)
P07B06	Monte Carlo Simulation of Neutron Spectrum in Packaged Semiconductors induced by Cosmic Radiation during Air Transport Juhyuk Lee, Hyun Nam Kim, Heon Yong Jeong, and Sung Oh Cho(KAIST)
P07B07	Evaluation of Fast Neutron Response of OSLD by <sup>252</sup> Cf Neutron Source Yong-Uk Kye and Hee-Seock Lee(PAL, POSTECH)
P07B08	Measurement of Indoor Radon Concentration at Malaysia Nuclear Agency (Malaysia Nuclear) and Radionuclide Monitoring Station, Cameron Highlands, Pahang, Malaysia Nur Syuhada Izzati Ruzali and Syazwani Mohd Fadzil(SAP UKM), Faizal Azrin Abdul Razalim, Nur Khairunnisa Zahidi, and Raymond Yapp Tze Loong(HPG UKM)
P07B09	Status of RI Handling Facility in KOMAC Yi-Sub Min, SungKyun Park, JeongMin Park, and J.S. Lee(KAERI)
P07B10	Simulation of Release Inventories of Primary Nuclides from PIE in Hotcell Heemoon Kim, Eui Young Kim, and Young Gwan Jin(KAERI)
P07B11	Evaluation of Neutron Production Yields Using Various Physics Models in Monte Carlo Simulation Codes Dong-geon Kim, Junesic Park, Jaebum Son, Yong Hyun Kim, Jihun Moon, Jae Young Jung, Chang Ho Shin, and Yong Kyun Kim(HYU)
P07B12	Monte Carlo Calculation for the Estimation of the Fast Neutron Distribution from DT Neutron Generator for Air Cargo Inspection System Kyungmin Oh, Yeongheum Yeon, and Byeongno Lee(KAERI)
P07B13	Evaluation of Dose and Risk to the Public around Uranium Mining Area in Mongolia Batbuyan Tseren and Juyoul Kim(KINGS)
P07B14	Natural Radiation Survey in Dalat University Huy Le, Suk SooDong, Son Nguyen, and Ha Nguyen(DLU)
P07B15	Design of Adsorption Module and Air-sampling System for <sup>85</sup> Kr Analysis Young Gun Ko, Hyuncheol Kim, Hajin Song, Jeonghyeon Ryu, Sang-Do Choi, Jong-Myoung Lim, and Wanno Lee(KAERI)
P07B16	Requirements on Development of Health Effect Assessment Module for the Korean-specific Level 3 PSA Code Keonmin Kim, Seunghee Lee, Hyejin Kim, and Sukhoon Kim(FNC Tech.)
P07B17	Development of Freshwater Foodchain Model for Estimating Radionuclide Concentration in Aquatic Products Following Nuclear Accident Sora Kim, Kyung-suk Suh, Byung-Il Min, Kihyun Park, Byung-Mo Yang, and Jiyeon Kim(KAERI)
P07B18	Preliminary Study on Determination of Radium-226 in Soil by Radon Emanation and Gamma Spectrometry Methods Soo Yeon Lim and Sang Hoon Lee(KNU), Nur Syamsi Syam(BAPETEN), Seongjin Maeng(RSRI)
P07B19	Assessment of Soil Water Content Parameter on Radon and Thoron Exhalation Rate Seong Jin Park and Seung Yeon Han(KNU), ahmad ciptadi Syuryavin and muttaqin margo Nirwono(BAPETEN), Sang Hoon Lee(RSRI)
P07B20	The Concept Design of Cloud Server for Integrated Environmental Radiation Management Systems Jinhyung Lee, Eun Han Kim, Sand-Do Choi, Seon-Ha Kim, Jong-Myoung Lim, and Wanno Lee(KAERI)
P07B21	Assessment of Inhalation Dose for Decontamination Worker of Contaminated Soil on Decommissioning Site in Korea So-Hyeon Lee and Tae-Jong Jung(UST), Dong-Kwon Keum, Hyo-Jun Jeong, In Jun, Kwang-Muk Lim, and Yong-Ho Choi(KAERI)

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- P07B22    Dose Assessment of Urban Environment Based on Deposition Measurement Data after Fukushima Daiichi NPP Accident  
Joeun Lee, Wontae Hwang, Moonhee Han, Eunhan Kim, and Cheolwoo Lee(KAERI)
- P07B23    Development of Scenario Variable Template for Emergency Response Exercise to the Nuclear Accident in Neighboring Countries  
Juyub Kim, Hyejin Kim, and Sukhoon Kim(FNC Tech.)
- P07B24    Improvement of Evaluation Model for Emergency Response Exercise to the Nuclear Accident in Neighboring Countries  
Hyejin Kim, Juyub Kim, and Sukhoon Kim(FNC Tech.)
- P07B25     $\beta$ -Apocropodophyllin as Novel Radiosensitizer Promotes ER Stress Signaling – ROS – Cell Death Pathway.  
Jeong Hyun Cho, Ju-Yeon Kim, A-Ram Kang, Nagyeong Lee, Jie-Young Song, Sang-Gu Hwang, Hong-Duck Um, and Jong Kuk Park (KIRAMS)
- P07B26    Design of GPM System for Reusing High Purity Xenon Gas  
HyunWoo Jung and Dong Hoon Lee (TU), Thi Dung Tran(UST), BongHwan Hong and Seungwoo Park (KIRAMS)

## 방사선 이용 및 기기 (Radiation Utilization and Instrumentation)

8A

5. 23 (목)

### 방사선 기기 개발 및 응용 (Development and Applications of Radiation Devices)

I 좌장 김기현(Geehyun Kim), 김인중(In Jung Kim)

I 발표장소 삼다홀B

## 초청발표

- 09:00 Radioactive Well logging in Korea  
Seho Hwang and Jehyun Shin(KIGAM)
- 09:30 Performance Comparison of Imaging Modality of Hybrid Gamma Imaging System Using Monte Carlo Simulation  
Hyun Su Lee, Jae Hyeon Kim, Junyoung Lee, and Chan Hyeong Kim(HYU)
- 09:50 A Multi-radiation Generator System based on 15 MeV Electron Linear Accelerator  
Byeongno Lee, Kyungmin Oh, Jinsik Ju, Yeongheum Yeon, Moonsik Chae, Jungho Moon, Jaehyun Lee, namho Lee, and Seehee Kim(KAERI)
- 10:10 Calculation of Detection Efficiency of Volume Source at a Horizontal Geometry by EXVol Code  
M.Y. Kang, Euntaek Yoon, and H.D. Choi(SNU), G.M. Sun(KAERI)
- 10:30 Coffee Break
- 10:50 Simulation-based Calibration Approach to Large-area Phoswich Detectors for Simultaneous Alpha/Beta Detection  
Wooseub Kim, Jinhwan Kim, Junhyeok Kim, Sopan Das, Minhwan Kim, Eunbi Ko, and Gyuseong Cho(KAIST)
- 11:10 Neural Network Approach to the Quantitative Analysis of Low-resolution Gamma Spectra with Uncertainty  
Jinhwan Kim, Kilyoung Ko, Wooseub Kim, and Gyuseong Cho(KAIST)
- 11:30 Electron and Proton Edge Calibration for a Propane-filled TEPC  
Justin Malimban, Sukwon Youn, and Sung-Joon Ye(SNU)
- 11:50 Effect of Tooth Positioning on EPR Dosimetry  
Jeonghun Oh, Jong In Park, Kwon Choi, Chang Uk Koo, and Sung-Joon Ye(SNU)

8B

5. 24 (금)

### 동위원소 및 중성자 이용 (Utilization of Radioisotopes and Neutrons)

I 좌장 문진호(Jinho Moon), 선광민(Gwang Min Sun)

I 발표장소 202A

- 09:00 Determination of Minimum Detectable Activity for Underwater Radiation Detection System  
Jang-Guen Park, Sung-Hee Jung, Jinho Moon(KAERI), Daemin Oh, Sungwon Kang, and Youngsug Kim(KICT)
- 09:20 Comparison of GaN-based Betavoltaics Fabricated on Different Epitaxial Structures  
Dong-Seok Kim, Yong Seok Hwang, Jaekwon Suk, Jae Sang Lee(KAERI, KOMAC), Jun-Hyeok Lee, Jeong-Gil Kim, Hyeon-Su Lee, and Jung-Hee Lee(KNU)
- 09:40 Comparative Study of Sr-82 Purification Procedures used at Brookhaven National Laboratory and ARRONAX  
Yeong Su Ha, Sang-Pil Yoon, Han-Sung Kim, and Kye-Ryung Kim(KAERI)
- 10:00 Recent Status of Application of Radioisotope in Industry  
Jinho Moon, Jang-Guen Park, and Sung-Hee Jung(KAERI)
- 10:20 Immuno-PET Imaging of <sup>89</sup>Zr-Pertuzumab in Breast Cancer Model  
Jong Il Shin, Eun Kyung Kwon, Jung Young Kim, Kwang Il Kim, Joo Hyun Kang, and Tae Sup Lee(KIRAMS)



10:40	Coffee Break
11:00	Preparation for Simultaneous Determination of Stable Isotope Dy/Ho Separation by High-Performance Liquid Chromatography Aran Kim and Kanghyuk Choi(KAERI)
11:20	The Effect of Anion Treatment on the Chemical Stability of the Coated Ag during Iodine Removal Under Strong Alkaline Medium Myunggoo Kang, Seung-Kon Lee, Suseng Lee, and Jun Sig Lee(KAERI)
11:40	A Deterministic Dose Calculation Algorithm for Boron Neutron Capture Therapy Hyegang Chang, Sangmin Lee, and Sung-Joon Ye(SNU)
12:00	Neutron Beam Characterization and Neutron Yield for Be-9(p, n)B-9 of Accelerator-based Boron Neutron Capture Therapy using MCNP6, PHITS, and Geant4 Sangmin Lee, Hyegang Chang, and Sung-Joon Ye(SNU)
12:20	Stable Topological Insulator Bi <sub>2</sub> Te <sub>3</sub> Created by Ion Beam Irradiation Jun Kue Park, Chan Young Lee, Chorong Kim, Jaekwon Suk, Yong Seok Hwang, Myung-Hwan Jung, Won-Je Cho, and Jae S. Lee(KAERI)
12:40	Small Angle X-ray and Neutron Scattering Study on Hierarchical Superstructures of Multicomponent 1D Colloids Sung-Hwan Lim, Taehoon Lee, and Sung-Min Choi(KAIST)

## 8C

5. 23. (목)  
- 24. (금)

## 방사선 이용 및 기기 (Radiation Utilization and Instrumentation) – POSTER

| 좌장 박병건 (Byung-Gun Park), 박준규 (Jun Kue Park)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

P08C01	Characteristics of Polystyrene-based Plastic Scintillators Wooseub Kim, Yewon Kim, Giyoon Kim, Kyungtaek Lim, Kyeongjin Park, Hojin Kim, and Gyuseong Cho(KAIST)
P08C02	Characterization Experiments of LaBr <sub>3</sub> (Ce) and CeBr <sub>3</sub> Scintillator Woosong Hong and Geehyun Kim(Sejong Univ.)
P08C03	Simulation of <sup>85</sup> Kr Detector using Monte Carlo Code MCNP in Air HaJin Song, Young Gun Ko, Hyuncheol Kim, Jin Hyung Lee, Jong-Myoung Lim, and Wanno Lee(KAERI)
P08C04	A Study of the Sub-Detectors of Beta-Coincidence Spectroscopy Hyeon Min Lee, Gwang Min Sun, Han Rim Lee, Jaegi Lee, and Bo-Young Han(KAERI)
P08C05	Preliminary Study on the Use of NaI(Tl) Detector for the Marine Environmental Monitoring Seung Yeon Han, Seongjin Maeng, and Sang Hoon Lee(KNU), Hae Young Lee(RSRI)
P08C06	Energy Calibration of RBS System Using Mono-Isotopic Metal Films Kye-Ryung Kim, Hyeok-Jung Kwon, Jun-Mok Ha, Nam-Woo Kang(KAERI, KOMAC), Yong-Sub Cho(KAERI)
P08C07	Verification of Dose Assessment for 3D Printed Plastic Scintillator Sangmin Lee, Jaebum Son, Tae-Hoon Kim, Dong-geon Kim, Kihong Park, Jaeyeong Jang, Yong Kyun Kim(HYU), Hyun-Tai Chung(SNU)
P08C08	Development of a 3-D Printed Tumor-Shaped Scintillator Measurement System Tae Hoon Kim, Sangmin Lee, Dong Geon Kim, and Yong Kyun Kim(HYU), Hye Jeong Yang(CU), Hyun-Tai Chung(SNUH)

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- P08C09      **Simulated Spectral Responses of Thin Planar-Type Radiation Detectors by Tracking Primary Electrons from the Gamma-ray Interaction**  
Jaehyo Kim, Silvia Barros, and Geehyun Kim(Sejong Univ.)
- P08C10      **Neutron Multiplicity and Gamma Ray Correlation in the U/TRU/RE Ingot Produced from Pyroprocessing**  
Jihye Jeon and Geehyun Kim(Sejong Univ.)
- P08C11      **Installation of a Multi-radiation Generator System for Cargo Inspection**  
Yeong Heum Yeon, Byeong No Lee, Moon Sik Chae, Jung Ho Moon, Jae Hyun Lee, Nam Ho Lee, Kyung Min Oh, Jin Sik Ju, and See Hee Kim(KAERI)
- P08C12      **Conceptual Design of Target-Moderator for Cyclotron driven Compact Thermal Neutron Source**  
Byoungil Jeon, Jongyul Kim, and Myungkook Moon(KAERI)
- P08C13      **Development Iris Collimator Drive Program for Radiation Therapy**  
Jong Hyun Back, Su Chul Han, Gi-sub Kim, Haijo Jung, Munsik Choi, and Seungwoo Park(KIRAMS)
- P08C14      **An Analysis of Fossil Fuel CO<sub>2</sub> in the Atmosphere with Regional Characteristics in Gyeongju**  
Min-Ji Kong, Sang-Hoon Lee, Sae-Hoon Park, and Yu-Seok Kim(DU)
- P08C15      **Nuclear Design of Capsule for Advanced Material Analysis according to Installation of B4C (Boron-Carbide) in a IP5 hole**  
Hoonjo Cho, Seongwoo Yang, Keenam Choo, Mansoon Cho, Seungjae Park, and Yoontaeg Shin(KAERI)
- P08C16      **Confirmation of Experiment Conditions for Measuring the Environmental Sample in the Site**  
Jeong-Min Park, Yi-Sub Min, Sung-Kyun Park, and Jin-nyeong Choi(KAERI)
- P08C17      **Design Analysis of the Capsule for Irradiation of High-temperature Materials to be used in the Future Nuclear System**  
Man Soon Cho, Seong Woo Yang, Hoon Ho Cho, Kee Nam Choo, and Byung Hyuk Jun(KAERI)
- P08C18      **Buckling of Polymeric Surface by Electron Irradiation**  
Hyung San Lim, Sang Yoon Lee, Na Eun Lee, and Sung Oh Cho(KAIST)
- P08C19      **Fast-Neutron Tomography Techniques for a Mixture of High and Low Z Materials**  
Youngseok Lee, Jong-Gu Kwak, Hee-Soo Kim(NFRI), Malgorzata Makowska and Thomas Bucher(TUM)
- P08C20      **Fast Neutron Irradiation Effects on Threshold Voltage of Si Diode**  
Sung Ho Ahn, Gwang Min Sun, and Hani Baek(KAERI)
- P08C21      **Porosity Measurement in 3D Printed SS316 using Neutron Dark-field Imaging**  
Jongyul Kim, Byoungil Jeon, TaeJoo Kim(KAERI), Youngju Kim and Seung Wook Lee(PNU), Daniel Hussey(NIST)
- P08C22      **Energy Spectra of Gamma-rays and Electrons in the Silicon Carbide Irradiated with HANARO Neutrons**  
Ki-Man Lee and Byung-Gun Park(KAERI)
- P08C23      **Characterization of Martensitic Phase Transformations in Blue Phase Liquid Crystals Using In-situ Small Angle Scattering**  
Hyeong Min Jin and Young-Soo Han(KAERI), Xiao Li and Paul Nealey(UChicago)
- P08C24      **Nitrogen Ion Beam Enhances Attachment of Collagen on Poly L-Lactic Acid**  
Myung-Hwan Jung, Jun Kue Park, Chorong Kim, Won-Je Cho, and Jae S. Lee(KAERI)
- P08C25      **Activation Property of HANARO Spent Fuel in Dense Storage Rack**  
Byung-Gun Park, Gi-Doo Kang, and Myong-Seop Kim(KAERI)
- P08C26      **Graphene Film Synthesized by Electron Beam Irradiation on PVDC**  
Na Eun Lee, Sangyoon Lee, Hyungsan Im, Heon Yong Jeong, Jae Woo Lee, Yangjeong Park, Jungwoo Kim, and Sung Oh Cho(KAIST)
- P08C27      **Fabrication of Biocompatible and UV Absorbing Active Ingredients in Sunscreen by Electron Irradiation**  
Sangyoon Lee, Hyung San Lim, Na Eun Lee, and Sung Oh Cho(KAIST)
- P08C28      **Gamma Irradiation Improve Post-harvest Quality of Tomato**  
Jae-Kyung Kim, Hea-Jung Hong, Beom-Seok Song, Ha-Young Park, and Jong-Heum Park(KAERI)
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- P08C29    Evaluation of Metal Ion Catalyst Characteristic for Fabrication of Graphene Quantum Dots using Ion Beam Irradiation  
Seung Ho Lee, Hyeok-Jung Kwon, and Jun Mok Ha(KAERI, KOMAC)
- P08C30    A Study on Developing of Fiber-optic Neutron Detection System Using Gd<sup>202</sup>S:Tb and Evaluating the System through the KUCA Experiment  
Jin Hong Kim, Si Won Song, Hyun Young Shin, Jae Hyung Park, and Bongsoo Lee(CAU), Cheol Ho Pyeon(KU)

## 9A

5. 24 (금)

## 핵융합 및 가속기 (Nuclear Fusion and Accelerator)

| 좌장 윤건수(Gunsu Yun), 석희용(Hyyong Suk)

| 발표장소 401A

## 초청발표

- 09:00 Reconsideration of Korean DEMO Role and Future Step for More Actual Fusion Energy Roadmap  
Dong Won LEE(KAERI)
- 09:30 Introduction to K-DEMO design activity in National Fusion Research Institute  
Suk-Ho Hong(NFRI) and DEMO Research Division members
- 10:00 Divertor Plasma Simulating Facility using AF-MPD Thruster for Testing Divertor Cooling Channel Mockup  
Kil-Byoung Chai, Duck-Hee Kwon, Min Park, and Seong-Jin Jeon(KAERI)
- 10:20 Coffee Break

## 초청발표

- 10:40 Advanced Diagnostics for Fusion Plasma Instabilities on the KSTAR Tokamak  
Gunsu Yun (POSTECH)
- 11:10 Laser-plasma Terahertz-based Electron Density Diagnostics  
Keekon Kang and Hyyong Suk(GIST)
- 11:30 Status of DIAC and Future Utilizations in Nuclear Research  
Yong-Sub Cho, Sung-Ryul Huh, Dae-Sik Chang, and Byung-Hoon Oh(KAERI)

## 9B

5. 23 (목)

## 핵융합 및 가속기 (Nuclear Fusion and Accelerator) – POSTER

| 좌장 조용섭(Yong-Sub Cho), 윤건수(Gunsu Yun)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P09B01 Designing and Fabrication of Carbon Nano Tube(CNT) based Miniature X-ray Tube to be used in a Nondestructive System for a Micro Defect  
Hyunnam Kim, Juhyuk Lee, Heonyong Jeong, and Sungoh Cho(KAIST)
- P09B02 The PLC based Resonance Control Cooling System Upgrade at The KOMAC  
Kyung-Hyun Kim, Hyeok-Jung Kwon, Han-Sung Kim, Young-Gi Song, Hae-Seong Jeong, Seong-Gu Kim, and Jae-Ha Kim(KAERI, KOMAC)
- P09B03 Upgrading Equipment Lifecycle Information Management System at KOMAC  
MunHo JO, HanSung KIM, HyeokJung KWON, KyungHyun KIM, Kaell KIM, SeongGu KIM, HaeSeong Jeong, and JaeHa KIM(KAERI, KOMAC)
- P09B04 The RF Interlock System for the KOMAC 100-MeV Proton Linac  
Seong-Gu Kim(KAERI, KOMAC)
- P09B05 Simulation of Klystron-Modulator using Pspice for Applying New Klystrons in KOMAC  
Hae-Seong Jeong, Seong-Gu Kim, Kyung-Hyun Kim, Han-Sung Kim, and Hyeok-Jung Kwon(KAERI, KOMAC)

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- P09B06 Construction and Evaluation of X-ray Detection and Analysis System for the External PIXE at KOMAC  
Jun Mok Ha, Seoung Ho Lee, Kye-Ryung Kim, and Yong Sub Cho(KAERI)
- P09B07 Tendency Analysis of the WPS for Monitoring Movement of the Accelerator Building at KOMAC  
Dae-Il Kim, Jae-Ha Kim, Hyeok-Jung Kwon, and Han-Sung Kim(KAERI, KOMAC)
- P09B08 Design of RF Reference Distribution System for the RISP Linac  
Kyungtae Seol, Hyojae Jang, and Hoechun Jung(IFS)
- P09B09 Necessity for a Korea-Fusion Neutron Source (K-FNS) following Worldwide Development Strategy of Future Fusion Power Plants  
Doo-Hee Chang, Sun-Ho Kim, and Dong Won Lee(KAERI)
- P09B10 Procedure for Qualification Testing of ITER HCCR Test Blanket Sub-module  
Suk-Kwon Kim, Chang Wook Shin, Seong Dae Park, Hyung Gon Jin, Sunghwan Yun, Eo Hwak Lee, Jae-Sung Yoon, and Dong Won Lee(KAERI)
- P09B11 Research on Hydrogen Isotope Storage Beds at KAERI  
Jisoo Kim, Samuel Park, and Hongsuk Chung(UST, KAERI), Hee-seok Kang(KAERI)
- P09B12 Mechanical Properties of Dissimilar TIG Welding using ARAA and SS316L  
Jae Sung Yoon, Suk-Kwon Kim, Eo Hwak Lee, Hyung Gon Jin, Dong Won Lee, Seong Dae Park(KAERI), Seungyon Cho(NFRI)
- P09B13 Mechanical Analysis of HCCR-TBM Preliminary Design (PD) 2 Model with Various Loads  
Seong Dae Park, Dong Won Lee, Eo Hwak Lee, Jae-Sung Yoon, Suk-Kwon Kim, Hyung Gon Jin, Sunghwan Yun(KAERI), Seungyon Cho(NFRI)
- P09B14 Design of a Tritium Adsorption Bed in the Coolant Purification System  
Changwook Shin, Eo Hwak Lee, Suk-Kwan Kim, Hyung Gon Jin, and Dong Won Lee(KAERI)
- P09B15 Upgrade the Helium Circulator for the HeSS Experimental Facility  
Eo Hwak Lee, Suk-Kwon Kim, Hyung Gon Jin, Chang Wook Shin, Dong Won Lee(KAERI), Seungyon Cho(NFRI)
- P09B16 Neutron Flux Measurement using Activation of Nickel during KSTAR Operation  
Hee-Soo Kim, Jong-gu Kwak, Youngsoek Lee, Sang-tae Kim, and Kap-rai Park(NFRI)
- P09B17 Parametric Study for Gap Thickness of Compact Fusion Neutron Source Shield Design  
Sunghwan Yun, Bong-Ki Jung, Dong Won Lee, Sun-Ho Kim, Jeong-Tae Jin, Suk-Kwon Kim, and Byung-Hoon Oh(KAERI)

## 원전 건설 및 운영 기술 (Nuclear Power Plant Construction and Operation Technology)

### 10A

5. 23 (목)

#### 운영기술 (Plant Operation & Maintenance)

I 좌장 이재곤(Jaegon Lee), 오영진(Young-Jin Oh)

I 발표장소 401A

- 09:00 Review of Plant Engineering Model and Process Improvement  
TAE YOUNG JU(KHNP CRI)
- 09:20 Introduction to 2018 Revision of KEPIC Non-Destructive Examination Requirement  
Tae-sik Won, Hyun-jae Joo, and Myoung-sung Sohn(KEA)
- 09:40 Development of the Biaxially Prestressed Specimen for Prediction of Prestress Loss in Containment Buildings  
Gyeong-Hee An(KAERI), Sang-Lyul Cha and Jin-Keun Kim(KAIST)
- 10:00 Inspection, Repairing Methods and Consequences of Buried Piping Failure in Nuclear Power Plant  
Yong-Sang Kim, Joo Kyung Lee, and Dong-Yeol Kim(KINS)
- 10:20 Machine Learning Approach for Thinned Pipe Classification using Thickness Measurement Data of Nuclear Secondary Piping Systems  
Young-Jin Oh, Kye-Kwang Jee, and Heung-Bae Park(KEPCO E&C)
- 10:40 Coffee Break
- 11:00 Effect of Gamma Radiation on Degradation Behavior of Polymeric Materials  
Inyoung Song and Ji Hyun Kim(UNIST), Taehyun Lee and Kyungha Ryu(KIMM)
- 11:20 Analysis of Hydrogen Isotopes in Liquid Water Using Laser Ablation Molecular Isotopic Spectrometry  
SUNGUK CHOI, SOLCHAN HAN, and JONGIL YUN(KAIST)
- 11:40 MRPC Noise Limit of Alloy 690TT Steam Generator Tube for Detecting OD Axial Cracks and Decreasing General Corrosion Rate  
Hee-Sang Shim, Myung Sik Choi, Deok Hyun Lee, and Do Haeng Hur(KAERI), One Yoo(KEPCO E&C)

### 10B

5. 23 (목)

#### 내진해석 (Seismic Analysis)

I 좌장 구경희(Gyeong-Hoi Koo), 장영선(Young-Sun Jang)

I 발표장소 401B

- 09:00 A Scalability Method for the Seismic Test of a Spent Fuel Storage Pool  
Heung Seok KANG, Kang Hee LEE, Dong Seok Oh, Kyung Ho Yoon, and Soo Ho Kim(KAERI)
- 09:20 Dynamic Impact Force Behavior of Spent Fuel Pool using Seismic Table under DBE and BDBE Conditions  
Kyungho Yoon, Kang-Hee Lee, Dong Seok Oh, Sooho Kim, and HeungSeok Kang(KAERI)
- 09:40 Sensitivity of Elasto-Plastic Material Models for Strain-Based Seismic Design of Nuclear Fragile Components  
GYEONG HOI KOO(KAERI)
- 10:00 Experimental Study on the ICRS Amplification of Electrical Cabinet  
IN-KIL CHOI, Seunghyun Eem, and Sang Jin Lee(KAERI), and Bub-Gyu Jeon(PNU)
- 10:20 Some Insights on Scale Rack Motion during the Seismic Excitation in Simulated Spent Fuel Pool Accident  
Kang-Hee Lee, Heung-Seok Kang, Dong-Seok Oh, Kyung-Ho Yoon, and Soo-Ho Kim(KAERI),  
Cheong-Ryul Choi(Elsoltec)
- 10:40 Coffee Break
- 11:00 Analysis of Horizontal Hysteretic Behavior of LRB in Two-Dimensional Large Deformation Behavior  
Minkyu Kim(KAERI)

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| 11:20 | Experiment of Dynamic Pressure Distribution on Spent Fuel Pool Model due to Sloshing<br>Dong Seok Oh, Soo Ho Kim, Kang Hee Lee, Kyung Ho Yoon, and Heung Seok Kang(KAERI) |
| 11:40 | Safety Review and Action for Earthquake in Nuclear Power Plants<br>Chang Seok Park(KHNP), Jin Weon Kim(CSU)   |
| 12:00 | Decrement Damping Ratio of Light Equipment due to Structure-equipment Interaction<br>Hyeon-Keun Yang, Hong-Gun Park, and Ju-Hyung Kim(SNU)                                |
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**10C**  
**5. 24 (금)**

## 내진 및 구조해석 (Seismic and Structural Analysis)

| 좌장 박준희(Junhee Park), 현창현(Chang-Hun Hyun)

| 발표장소 401B

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|-------|--|
| 09:00 | Vibration Control of Piping System in Nuclear Power Plant Using Elasto-plastic Steel Coil Spring Damper under Earthquake<br>Sung Gook Cho(Innose Tech), Osamu Furuya(TDU), Hiroshi Kurabayashi(Vibro system)                                 |
| 09:20 | Determination of Proportional Damping Matrix in Dynamic Analysis using Direct Integral Method under Simultaneous Excitation in Three Direction<br>Choon-Gyo Seo, Young-Suk Lee, Kag-Su Jang, and Young-Sik Jang(KEPCO E&C)                   |
| 09:40 | Shear Capacity Evaluation of RC Shear Wall by Bi-directional Horizontal Loading Test<br>Junhee PARK and Kunsoo KIM(KAERI)  |
| 10:00 | Development of Sampling-based Risk Quantification Code for Seismic Probabilistic Safety Assessment<br>Shinyoung Kwag, Junhee Park, and In-Kil Choi(KAERI)  |
| 10:20 | Experimental Investigation of Soil-Structure Interaction Effect on Seismic Structural Response using Centrifuge Test<br>Jeong-Gon Ha(KAERI), Kil-Wan Ko and Dong-Soo Kim(KAIST)  |
| 10:40 | Coffee Break   |
| 11:00 | Ground Motion Response Spectra Considering Soil Amplification<br>Jin Ho Lee(PKNU), Jung Han Kim(PNU)   |
| 11:20 | Investigation of Pressure Distribution by Sloshing Effect for the Seismic Safety Assessment of the Spent Fuel Pool<br>Won Man Park, Sungman Son, Dae Kyung Choi, and Choengryul Choi(Elsoltec), Kang Hee Lee and Heung Seok Kang(KAERI)      |
| 11:40 | Validation of an Equivalent Test Condition for a Scaled-down Model of the Spent Fuel Pool for Seismic Safety Assessment<br>Sungman Son, Won Man Park, Dae Kyung Choi, and Choengryul Choi(Elsoltec), Kang Hee Lee and Heung Seok Kang(KAERI) |
| 12:00 | Generation of a Pilot GMRS through Probabilistic Site Response Analysis<br>Seung Ryong Han, Young Suk Lee, and Jae Hee Kim(KEPCO E&C)  |
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## 10D

5. 24 (금)

### 원전 설계 (Plant Design)

| 좌장 정대율(Dae-Yul Chung), 강덕지(Deog-Ji Kang)

| 발표장소 401B

- 13:30 Evaluation of the Increase in the POSRV Closing Time for APR1400  
Tech Mo Kim, Ju Han Lee, In Ho Song, and Gyu Cheon Lee(KEPCO E&C)
- 13:50 CFD Analysis for Control Element Drive Mechanism Cooling Fan  
Won Ho Jo, Myoung Goo Lee, Yeon Ho Cho, and Hyun Min Kim(KEPCO E&C)
- 14:10 A Study on Improvement of the Reactor Cavity Model  
Ho Jung Lee, Soung Kyu Lee, Min Gyu Kim, Yeon Ho Cho, and Hyun Min Kim(KEPCO E&C)
- 14:30 Blockchain for Configuration Management in Nuclear Power Plants  
Choong-koo Chang(KINGS)
- 14:50 Flash Chamber Design for the AM600  
Robert Field and Nghia Dao(KINGS)
- 15:10 Coffee Break
- 15:30 Optimization for the Nuclear Heat Storage and Recovery Rankine Cycle  
Anna Kluba and Robert Field(KINGS)
- 15:50 Nuclear Heat Storage and Recovery in a Renewable Energy Future  
Kafilat Funmilola Amuda and Robert Field(KINGS)
- 16:10 Effect of Bi-directional Loading on the Shear Strength of RC Shear Wall : Finite Element Analysis  
Kun-Soo Kim and Junhee Park(KAERI)
- 16:30 Structural Analysis of Spent Fuel Dry Storage Facility Against Aircraft Collision  
Tae-Yong Kim, Jae Min Sim, and Yoon-Suk Chang(KHU)

## 10E

5. 23 (목)  
- 24(금)

### 원전건설 및 운영기술

#### (Nuclear Power Plant Construction and Operation Technology) – POSTER

| 좌장 임상규(Sang-Gyu Lim), 황도현(Do Hyun Hwang)

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P010E01 Critical Power Ratio with New Pressure Tube Creep Data of a CANDU-6  
Joo Hwan Park, Jong Yeob Jung, and Gyeong Geun Lee(KAERI)
- P010E02 Analysis for Structural Integrity and System Stability of Design Improved Strainer Installed in Feedwater System  
Min Hyok Heo and Jin Weon Kim(CSU)
- P010E03 Long-term Effect of Different Temperature and Humidity Conditions on TEDA-Impregnated Activated Carbon  
Hyun-Chul Lee, Gyu-Tae Kim, and Doo-Yong Lee(FNC Tech.), Hak-Soo Kim and Cho-Rong Kim(KHNP CRI)
- P010E04 Integrity Evaluation of the Spent Fuel Storage Rack by the Neutron Irradiation  
kiyoung Kim and sunghwan Chung(KHNP CRI), junhee Hong(CNU)
- P010E05 Examination of Effective Measures to Implement PSR in an Enhanced PSR Environment  
Jeung-Wook Kim(KHNP CRI)



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- PO10E06 Study on the Life Determination and Extension Methods of Life-limited Items of Nuclear Power Plant(Based on EPRI NP-6408)  
Chan-Gyu HAN and Yeon-Seung KIM(KINS)
- PO10E07 Comparison of Required Thrusts between Static Diagnostic Test and Performance Prediction for Air-Operated Valves in NPPs  
Hyun Chul Kim and Jin A Jang(KEPCO E&C)
- PO10E08 A Study of Improvements to a Periodic Safety Review According to WENRA Reference Levels  
Tae Kyu Ham and Jae Ok Ban(KHNP CRI)
- PO10E09 Evaluation of Automated Cycle Counting Algorithms for APR1400 Fatigue Monitoring System with Power Ascension Test Results of Shin-Kori Nuclear Power Plant Unit 3  
Jihong Min, Juhan Lee, Inho Song, and Gyucheon Lee(KEPCO E&C)
- PO10E10 Methods of Evaluation for Sealing Load of Air Operated Globe Valves at Closing Stroke in Nuclear Power Plants  
JeWook Lee and JinA Jang(KEPCO E&C)
- PO10E11 Ultrasonic Cleaning for Reloaded Nuclear Fuel in Domestic NPP  
SangWoo Kim, SunYong Park, GyungHoon Kim, WookJin Han, and SangKyun Woo(KEPCO NF)
- PO10E12 Development of a Methodology for the Selection of Cable Priorities for Condition Evaluation in Nuclear Power Plants  
Jin-Ryang Kim and Ho-Geun Ryu(SOOSAN IND)
- PO10E13 Applicability Test of Cable Diagnostic Method based on Time-Frequency Domain Reflectometry  
Jin-Ryang Kim and Ho-Geun Ryu(SOOSAN IND)
- PO10E14 A Study of In-situ Monitoring of the Mechanical and Chemical Degradation of Primary Coolant Pipes in PWR Nuclear Power Plants  
Hansang Kim and Jaeok Ban(KHNP CRI)
- PO10E15 Design on Small-Scale Supercritical CO<sub>2</sub> Cycle Integral Test Facility  
Jang-Sang Kwon and Kwon-Yeong Lee(EEL)
- PO10E16 Layout Study for the Equipment of Passive Containment Cooling System in Containment Building of iPOWER  
Hyun jeong Kim, Chang min Park, Won bae Lee, and Kyu bok Lee(KEPCO E&C)
- PO10E17 Correlation between Seismic Intensity Measures and Building Response using Strong Earthquake Records in Korea  
Young-Sun Choun and Tae-Hyun Kwon(KAERI)
- PO10E18 Investigation of Seismic Response Reduction by Tuned Mass Damper in Surge Line  
Jinsung Kwak, Shinyoung Kwag, Hwanho Lee, Jinho Oh, and Gyeong-Hoi Koo(KAERI)
- PO10E19 Experimental Study on the ICRS Amplification Factor of Battery Charger due to the High-frequency Earthquake  
Seung-Hyun Eem, In-Kil Choi, and Sang Jin Lee(KAERI), Young-Soo Jeong(KOCED)
- PO10E20 Nonlinear Seismic Analysis for Pipe Elbow under Sinus Cyclic Loading  
Sangjin Lee, Daegi Hahm, and Min Kyu Kim(KAERI)
- PO10E21 Analysis of Soil-Structure Interaction in Underground Water Tank Structures Considering Influence of Fluid  
Sung Gook Cho, Song Yi Choi, and Woong Ki Park(Innose Tech)
- PO10E22 Assessment of the Seismic Performance of a 125V DC Battery Charger Using the Shaking Table Test  
Sung-Wan Kim, Dong-Uk Park, Bub-Gyu Jeon, and Da-Woon Yun(PNU)
- PO10E23 Fatigue Behaviors of the Steel Pipe Tee in the Nuclear Power Plant Piping System  
Sung-Wan Kim, Bub-Gyu Jeon, and Da-Woon Yun(PNU), Min-Kyu Kim(KAERI)
- PO10E24 Floor Response Spectrum Analysis of Auxiliary Buildings of Nuclear Power Plant Using 3D FE Model  
Hyung-Kui Park, Tae-Hyun Kwon, and In-Kil Choi(KAERI)
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| P010E25 | Numerical Estimation of Overflowed Liquid for a Partially Filled Rectangular Container under Seismic Excitation<br>ByunYoung Chung, KangHee Lee, and HeungSeok Kang(KAERI) |
| P010E26 | The Study on Flight Initiation Wind Speed of Wind-borne Debris by Wind Tunnel Test<br>Junhee PARK, Daegi HAHM, and Minkyu KIM(KAERI), Soon-Duck KWON(JBNU)                 |
| P010E27 | Preliminary Analysis of Transport and Storage Cask under 9 m Side Drop Condition<br>Hyun-Gon Kim, Dong-Hyun Kim, Tae-Jin Kim, and Yoon-Suk Chang(KHU)                      |
| P010E28 | Simulation Study on Stress Analysis of Double-etched Type Printed Circuit Heat Exchanger<br>Armanto P Simanjuntak and JaeYoung Lee(HGU)                                    |
| P010E29 | Comparison of Stiffness According to Shape of Spacer Grid<br>Yong Hwi Kim, Moon Ki Kim, and Jae Boong Choi(SKKU)   |

## 원자력정책, 인력 및 협력 (Nuclear Policy, Human Resources and Cooperation)

### 11A

5. 23 (목)

#### 원자력정책, 인력 및 협력 1 (Nuclear Policy, Human Resources and Cooperation 1)

| 좌장 정익(Ik Jeong), 정서영(Seo Yeong Jeong)

| 발표장소 400

- 09:00 An Estimation of Plutonium Inventories of 5MWe Yongbyon Reactor with MCNP6  
Geon Hee Park and Ser Gi Hong(KHU)
- 09:20 A Study on Roadmap for North Korea's Denuclearization  
Jisun Kim, Seul Ki Lim, Dokyun Kim, and Hyung Jin Shim(SNU)
- 09:40 A Study on the Concept of Denuclearization : Focusing on Verification  
Jung-Hyun LEE and Young Wook LEE(KINAC)
- 10:00 Examining Public Perceptions of Radiation Emergency Preparedness: Based on the Survey Among the Citizens of Pusan City  
Hyo Jung Kim and Tae Ryong Kim (KINGS), Jang Hee Lee and Hee Jin Kim(BMC)
- 10:20 Coffee Break
- 10:40 Sensitivity Analysis for Financial Feasibility of Nuclear Power Plant Projects  
Donghwan Kim(KEPCO KPS), Sanghyun Sung, Edwin Banobi, and Wooyong Jung(KINGS)
- 11:00 Construction Strategy of SMART Nuclear Power Plants in Saudi Arabia  
Chul Yong Paik and Du Ill Kim(SPC)
- 11:20 A Study of Risk Communication Under Energy Transition Government  
Kilyoo Kim(KAERI)

### 11B

5. 24 (금)

#### 원자력정책, 인력 및 협력 2 (Nuclear Policy, Human Resources and Cooperation 2)

| 좌장 정구영(Ku Young Chung), 김수은(Soo Eun Kim)

| 발표장소 400

- 09:00 Regulatory Consideration on Physical Protection Against Sabotage  
Jeong-ho Lee and Hyun-Kyung Lee(KINAC)
- 09:20 Application of Deep Learning to Detect Nuclear Material Diversion using Surveillance Video  
Se-Hwan Park, Byung-Hee Won, Hee-Sung Shin, and Seong-Kyu Ahn(KAERI), Shin-Dong Kang(Idosi)
- 09:40 Nuclear Disarmament Verification Approach: The Black Sea Experiment and UKNI  
Hojung Do, Young Wook Lee, Minsoo Kim, and Jung-hyun Lee(KINAC)
- 10:00 A Consideration of the Nonproliferation Acceptability: A Case of the U.S.-Japan NCA  
Jae Soo Ryu, Youngwoo Lee, and Keonhee Lee(KAERI)
- 10:20 Coffee Break
- 10:40 A Study on Necessity and Implication of Atomic Energy Inspector Certificate  
Sangcheol Hyung and Jin Young Lee(KINAC)
- 11:00 Fostering Safety Culture - Approach Taken by Regulatory Expert Organization KINS and Lessons Learned  
Su Jin Jung, Young Sung Choi, and Chang Rae Kim(KINS)
- 11:20 A Suggestion on Improvement of Nuclear Safety Legislation  
Min Baek(KINAC)

# 11C

5. 23(목)  
- 24(금)

## 원자력정책, 인력 및 협력 3

### (Nuclear Policy, Human Resources and Cooperation 3) – POSTER

| 좌장 심형진(Hyung Jin Shim), 이기복(KiBog Lee)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P011C01 Nuclear R&D Capacity and Web-based Education Program Development  
Eui Jin Lee, Youngmi Nam, HyeSeon Hwang, Sipyo Rho, Sang Ki Min, Yu Rim Jin, Soo Jin Lee, and Eun Kyoung Lee(KAERI)
- P011C02 A Study on the Relationship among Knowledge Sharing, Peer Relation and Supervisor Support of Nuclear R&D Personnel  
YouRim Jin and SangKi Min(KAERI)
- P011C03 The Needs Analysis of the Leadership Competency Development of Nuclear R&D Personnel  
Eun-Kyoung Lee, Soo-Jin Lee, Hye-Seon Hwang, and Sang-Ki Min(KAERI)
- P011C04 Changes of Nuclear Policy and Significance of the Referendum in Taiwan  
SungWon Yun, JaeSoo Ryu, and MiJin Kim(KAERI)
- P011C05 Cost Competitiveness Simulation of Nuclear Power Plant Considering External Cost and Tax Fairness  
Hwadeok Jung, Jongmyong Park, and Wooyong Jung(KINGS)
- P011C06 Procedures for Preparing the Expanded Declarations at KAERI  
ByungDoo LEE, JuAng JUNG, HyungJo KIM, HyunSook KIM, SeongMi HAN, SeungHo LEE, and InChul KIM(KAERI)
- P011C07 A Study on Current Status and Challenge of the Application of Safeguards by Design  
Jin Young LEE(KINAC)
- P011C08 A Study on Improvement Method of Technology Export Control through SMART PPE Project Export Control Implementation  
Beomseok SHIN(KINAC)
- P011C09 A Study on the Analysis of Proficiency Distribution of Response Agents to Nuclear Emergency  
Seokki Cha(HYU,KIRAMS), Sang Tae Kim(NSSC), Hyo Rak Lee, Young Woo Jin, and Minsu Cho(KIRAMS)
- P011C10 The Calculation of Amount in Quality Elements of Nuclear Research Projects  
KWAN-HYUN KIM(KAERI)
- P011C11 The Direction of ROK-SP and Its Role in the Future: Comparison between ROK-SP and USSP  
Minyeon KIM(KINAC)
- P011C12 A Study on Changes in Session Classification of 'Nuclear Energy' News (2000 – 2017)  
Seungkook Roh(KAERI), Yoonjung Park(CNU), Hyunjin Kim(KINAC)
- P011C13 Legal Case Study on the Lawsuit Against Life-extension License of the Wolsong Unit 1  
Daesung Lee, Sungjin Choi, and Jaeyoung Bang(KAERI)
- P011C14 An Evaluation of Strength and Weakness of Coupling Options for Nuclear-Renewable Hybrid Energy System  
So-Bin Cho and Man-Sung Yim(KAIST)
- P011C15 A Comparative Analysis of Approaches toward JCPOA between the Obama and Trump Administration  
Keonhee Lee, Mijin Kim, Byung-Wook Lee, Youngwoo Lee, Jae Soo Ryu, and Junekyung Park(KAERI)
- P011C16 Suggestion of Improvement Plan for Follow-up Measures due to Reformulating DBT  
Jounghoon Lee(KINAC)
- P011C17 Analyzing Trends of the Incident and Trafficking Database of Nuclear and Other Radioactive Material  
Jounghoon Lee(KINAC)

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- P011C18    A study on the Role of MCR from the Viewpoint of Sabotage Mitigation  
YeonKyoung Bae and MyungSu Kim(KHNP CRI)
- P011C19    Quantitative Analysis of Uranium Concentration in LiCl-KCl Salt of Electrefining Process using LIBS  
Seul-Ki Han, Se-Hwan Park, and Seong-Kyu Ahn(KAERI)
- P011C20    Development of Resonance Laser-Assisted Sputtered Neutral Mass Spectrometry for Uranium  
Isotope Measurement  
Jinkyu Park, Sang Ho Lim, Chi-Gyu Lee, and Sun Ho Han(KAERI)
- P011C21    A Proposal to Improve Korean Nuclear Energy Legislative System  
JooHyung Moon and Seungyeob Ryu(KAERI)

## 원자력 계측제어, 인간공학 및 자동원격 (Nuclear I&C, Human Factors and Automatic Remote Systems)

12A

5. 23 (목)

### 원자력 계측제어, 인간공학 및 자동원격 A

#### (Nuclear I&C, Human Factors and Automatic Remote Systems A)

I 좌장 김만철(Man Cheol Kim), 김정택(Jung Taek Kim)

I 발표장소 402B

- 09:00 Review of Error Sources for Application of Thermocouples in RCS Temperature Measurement for an Integrated Reactor  
Inkoo Hwang, Sewoo Cheon, Gwisook Jang, Wonman Park, and Changhwoi Kim(KAERI)
- 09:20 Application of Safety Grade Display System to Accident Monitoring for Nuclear Power Plants  
Koheun Kim, Ji Hyeon Kim, and Sung ho Kim(KEPCO E&C)
- 09:40 Development and Design Validation of Reactor Protection System Verification Facility for SMART  
Seo Ryong Koo, Seop Hur, and Chang Hwoi Kim(KAERI)
- 10:00 A Computerized Operator Support System to Monitor the Technical Specification  
Subong Lee and Jonghyun Kim(CSU)
- 10:20 Development of Dependency Analysis Rules for Multi-Unit HRA  
Awwal Arigi and Jonghyun Kim(CSU)
- 10:40 Coffee Break
- 11:00 Experiment for Investigating Human Performances in Diagnostic Task under Seismic Situation  
Gayoung Park and Jonghyun Kim(CSU), Joohyun Sim(KAERI)
- 11:20 Software Reliability Growth Model for FPGA-based Safety Critical Software System  
Satrio Pradana and Jae Cheon Jung(KINGS)
- 11:40 Development of a Demonstrable Nuclear Cyber Security Test-Bed and Application Plans  
Chanyoung Lee and Poong Hyun Seong(KAIST), Cheol Kwon Lee and Jong Gyun Choi(KAERI)
- 12:00 Development of a Monitoring System for Data Integrity of PLC Code using BLockchain Technologies  
Moon Kyoung Choi and Poong Hyun Seong(KAIST), Chan Yeob Yeun(KUSTAR)

12B

5. 24 (금)

### 원자력 계측제어, 인간공학 및 자동원격 B

#### (Nuclear I&C, Human Factors and Automatic Remote Systems B)

I 좌장 이승준(Seung Jun Lee), 김윤구(Yun Goo Kim)

I 발표장소 402B

- 09:00 Development of Convolutional Neural Networks to Diagnose Abnormal Status in Nuclear Power Plant Operation  
Yun Goo Kim, Sun Mi Choi, and Jong Seol Moon(KHNP CRI)
- 09:20 In-Core Protection System Software Verification  
Joo Hyun Cho, Chang Ho Kim, Jong Soo Kwon, and Jae Hee Yoon(KEPCO E&C)
- 09:40 An Accident Diagnosis Algorithm with Untrained Accident Identification  
Jaemin Yang and Jonghyun Kim(CSU)
- 10:00 Application of Generative Model for Missing Signal Reconstruction in NPPs  
Seung Geun Kim, Young Ho Chae, and Poong Hyun Seong(KAIST)

- 10:20 Prediction of Reactor Vessel Water Level in Severe Accident Circumstances Using LSTM  
Young Do Koo, Ji Hun Park, and Man Gyun Na(CSU)
- 10:40 Coffee Break
- 11:00 Calculation Methods of Small RCS Leakage Rate through Related Measurements  
Kwae Hwan Yoo, Ye ji An, and Man Gyun Na(CSU)
- 11:20 Collapse Moment Estimation of Wall Thinned Pipe Bends and Elbows by Simplified Cascaded Fuzzy Neural Networks  
So Hun Yun, Young Do Koo, and Man Gyun Na(CSU)
- 11:40 Analysis of Decision-making Models for Mitigating Accidents in Extreme Conditions  
Seongkeun Kang and Poong Hyun Seong(KAIST)
- 12:00 Considerations on Machine Learning Programming of Multiple Linear Regression  
Yong Suk Suh, Seung Ki Shin, Dane Baang, and Jong Bok Lee(KAERI)

## 12C 5. 24 (금)

### 원자력 계측제어, 인간공학 및 자동원격 C (Nuclear I&C, Human Factors and Automatic Remote Systems C)

| 좌장 허균영(Gyunyoung Heo), 김사길(Sa Kil Kim )

| 발표장소 402B

- 13:30 An Experimental Study on the Impact of Fundamental Surprise on Human Performance: Research Design  
Sa Kil Kim, Joo Hyun Sim, and Yong Hee Lee(KAERI)
- 13:50 Design for Procedure Editor to Integrate Procedure Administration Tasks in Nuclear Power Plants  
Yeonsub Jung(KHNP CRI)
- 14:10 Quantity of Information in the Single Display for Efficient Situation Awareness  
Dong Yeon Lee and Hyun Chul Lee(KAERI)
- 14:30 General Description and Influencing Factors of Unexpected Plant Conditions  
Tae Jin Kim, Chang Ho Kim, Jong Soo Kwon, and Jae Hee Yun(KEPCO E&C), Poong Hyun Seong(KAIST)
- 14:50 A Conceptual Review of the Human Factors Engineering Process in the Design of APR1400 Man Machine Interface System  
Oluwasegun Adebena, Michael Utah, Jung Cheon, and Moon Choi(KINGS)

## 12D 5. 23 (목) - 24(금)

### 원자력 계측제어, 인간공학 및 자동원격 D (Nuclear I&C, Human Factors and Automatic Remote Systems D) – POSTER

| 좌장 구서룡(Seo Ryong Koo), 이정훈(Jeong Hun Lee)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P012D01 A Self-compensated Preamplifier Survived up to 1 Mrad of Total Ionizing Dose based on GBWP Compensation  
Changyeop Lee and Gyuseong Cho(KAIST), Inyong Kwon(KAERI)
- P012D02 Prevention of Cascading Failure in Electrical Protection Power System of Nuclear Generating Stations  
moustafa Moustafa(KINGS)

- P012D03 Implementation of a Differential Thermometer using the ADS1248  
Yun-Taek Im, Jae-Ha Song, Jin-Won Shin, Hyung-Kyoo Kim, and Young-San Choi(KAERI)
- P012D04 Review of Power Control in Research Reactor  
Yun-Taek Im, Seung-Gyu Doo, and Ki-Hyun Kim(KAERI)
- P012D05 A Study on the DI&C CCF Cognitive Methods in NPPs  
Songhae Ye and Chanhoo Sung(KHNP CRI)
- P012D06 Response Time Evaluation Methodology for Low Steam Generator Level Trip Function of the Plant Protection System  
Chang Jae Lee, Woong Seock Choi, Jong Soo Kwon, and Jae Hee Yun(KEPCO E&C)
- P012D07 Development and Test of Satellite Modem for Severe Accident Response System in NPPs  
Kwang Seop Son, Seok Boong Hong, and Chang Hwoi Kim(KAERI), Soon Jae Hwang(COMESA)
- P012D08 A 10-bit Radiation-Hardened R-2R Digital-to-Analog Converter for Nuclear Power Plant Applications  
Duckhyun Kim, Inyong Kwon, and Chang-Hwoi Kim(KAERI)
- P012D09 Radiation Effects of a Commercial Wireless Communication Module  
Dongseong Shin and Inyoung Kwon(KAERI)
- P012D10 Selection of Accident Monitoring Variables for a Research Reactor  
Jongbok Lee, Yongsuk Suh, and Sangmun Seo(KAERI)
- P012D11 Integration of the Communication Driver for the HANARO Control System  
Min woo LEE, Kyung chul Kim, Seung gyu Doo, Jeong Sik Hwang, Young San Choe, Hyung Kyoo KIM, and Sung Hyo LEE(KAERI)
- P012D12 Evaluation of Remote Injection Casting Integrated Proces  
Hoon Song, YoonMyung Woo, SangGyu Park, and JeongYong Park(KAERI)
- P012D13 Design of a Transimpedance Amplifier for a Radiation Detector to Observe a Nuclear Reactor under Severe Accidents  
Minuk Seung and Wooyoung Choi(Yonsei Univ.), Seop Hur and Inyong Kwon(KAERI)
- P012D14 Optimization of PI Controller for APR1400  
See Chae Jeong, In Ho Song, Jae Young Huh, and Gyu Cheon Lee(KEPCO E&C), Nam Kyun Kim(KHNP)
- P012D15 Analysis on Static Noise Margin of 10T SRAM for Radiation Tolerance  
Eunju Jo and Inyong Kwon(KAERI)

## 12E

5. 23(목)  
- 24(금)

### 원자력 계측제어, 인간공학 및 자동원격 E

### (Nuclear I&C, Human Factors and Automatic Remote Systems E) – POSTER

| 좌장 김장열(Jang Yeol Kim), 김태진(Tae Jin Kim)

| 발표장소 3층 로비

| 게시시간 5월 23일(목) 13:00 ~ 18:00 / 5월 24일(금) 09:00 ~ 17:00

| 저자 발표시간 5월 23일(목) 13:00 ~ 14:00

- P012E01 Study on PROFIBUS Network and Voltage Level  
Dongil Lee, Min-Seok Kim, Hosun Ryu, and Mingoo Kang(KHNP CRI)
- P012E02 The Study for Method to Prevent the Unplanned Trip of Field Equipment from a Wrong Signal of Digital Cards in Nuclear Power Plant  
Daegeun Shin and Dongil Lee(KHNP CRI)
- P012E03 Review of the Regulatory Positions and Guidance on Addressing Potential Common Cause Failures in Digital Instrumentation and Control Systems  
Seung Ki Shin and Yong Suk Suh(KAERI)



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- |         |  |
|---------|--|
| PO12E04 | A Study on Monitoring Human Performance of MCR Operators<br>Chanho Sung, Jungho Kim, and Songhae Ye(KHNP CRI)  |
| PO12E05 | A Preliminary Plan for the Human Factors Safety Verification of a Digital Device in Unexpected Situations of Nuclear Power Plants<br>Yong-Hee Lee(KAERI)   |
| PO12E06 | Review of the Assessment Items for the NPP Stress Test<br>Kyeongmin KIM, Chanho SUNG, and Jungho KIM(KHNP CRI)   |
| PO12E07 | Approached Against CCFs for Low Safety Significant Digital I&C Systems<br>Youngmi Kim and Seoungbaek Park(KINS)  |
| PO12E08 | A Study on the Implementation for Test Case of Digital Equipment using STPA<br>Hosun Ryu, Min-Seok Kim, and Dongil Lee(KHNP CRI)   |
| PO12E09 | A Study on the Test Method of Software Verification & Validation of Nuclear Power Plant<br>Min-seok Kim, Hosun Ryu, and Dongil Lee(KHNP CRI)   |
| PO12E10 | Loose Part Detection Technique in Nuclear Power Plant based on FE Simulation<br>Seongin Moon, Seongjin Han, To Kang, and Soonwoo Han(KAERI)  |
| PO12E11 | Development of Reactor Accident Classification Model using Long Short-Term Memory<br>Seongmin Son, ChoHwan Oh, and Jeong Ik Lee(KAIST)   |
| PO12E12 | Study on Early Leak Detection of PCS Coolant by Integrated System with Diverse Means of Multi-Sensing Technique<br>sang hoon Bae, wonman Park, and taesoon Kwon(KAERI)                               |
| PO12E13 | Comparison of Depth of Interaction Method for Radiation Measurement in High Temperature Environment<br>Chanho Kim, Dongyoung Kim, Yeeun Lee, and Jung-Yeol Yeom(KU), Inyong Kwon and Seop Hur(KAERI) |
| PO12E14 | Recognition of Wall Boundary Condition Variance using Convolutional Neural Network<br>Jonghwan Kim and Heungseok Kang(KAERI), Kwanghun Jeong and Junhong Park(HYU)                                   |

KOREAN NUCLEAR SOCIETY

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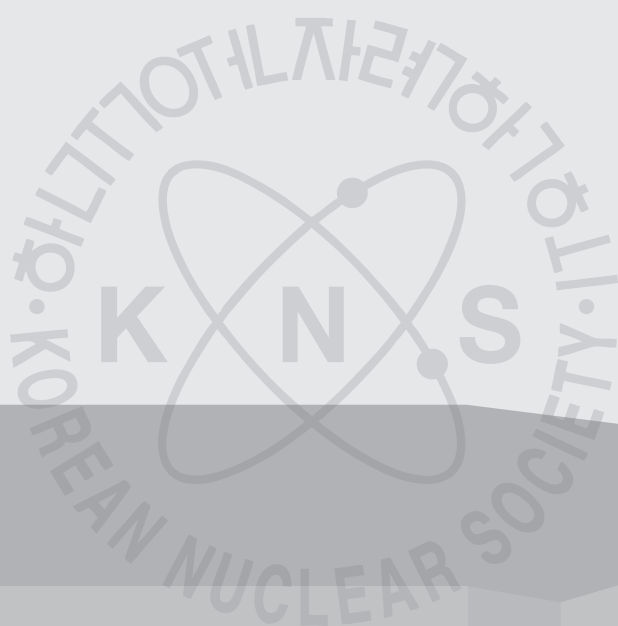
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# Workshop

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## A

## 원자력관계시설 부지안전성 평가

| 일시 · 장소 2019년 5월 24일(금) 14:00~18:00 · 제주 국제컨벤션센터, 4층 401A

| 주최 한국원자력학회 원자력안전 연구부회, 한국원자력안전기술원

일 정	내 용
14:00 ~ 14:10	개회사, 양준언 연구부회장 (한국원자력연구원)
14:20 ~ 14:50	원자력관계시설 해체관련 부지특성 조사·평가 규제요건의 이해, 현승규(KINS)
14:50 ~ 15:10	지하매질의 광물학적 특성과 핵종거동에 미치는 영향, 김재곤, 류정호(KIGAM)
15:10 ~ 15:40	건설/가동 원전부지 지하수계 내 핵종이동평가 및 해체원전부지 적용성 검토, 주병찬(KEPCO E&C)
15:40 ~ 16:00	국내 원자력시설 부지의 설계지진동 평가 규제기술 검토 및 향후 계획, 최호선(KINS)
16:00~16:20	Coffee Break
16:20 ~ 16:50	심층처분시설 부지특성 조사 및 평가 일반기준(안), 현승규(KINS)
16:50 ~ 17:20	심층처분시설 부지 암반의 수리역학적 및 열역학적 특성 조사, 민기복(서울대)
17:20 ~ 17:40	지하연구시설을 통한 심층처분시설 부지특성 조사 방법, 박보나(KINS)
17:40 ~ 18:00	질의 및 토의

| 기타사항 - 등록비 : 무료 (식사제공 없음)

- 문의처 : 현승규 / 한국원자력안전기술원 / 042-868-0785 / mgodo@kins.re.kr

## B

## 원전 극한재해 대응 안전성 증진 워크숍 - 사고관리계획서 및 스트레스테스트 중심 -

| 일시 · 장소 2019년 5월 24일(금) 13:00~18:00 · 제주 국제컨벤션센터, 3층 삼다홀

| 주최 한국원자력학회 원전건설 및 운영기술 연구부회

일 정	내 용
13:00 ~ 13:10	등록
13:10 ~ 13:30	개회사, 윤청로(한수원 전임 품질안전본부장)
13:30 ~ 14:00	특별 강연 극한재해에 대한 안전규제의 역할, 김인구 전문위원실장(KINS)
14:00 ~ 14:30	실체적 사고관리를 위한 제언, 정동욱 교수(중앙대)
14:30 ~ 15:00	주제 발표 사고관리계획서 규제 준비 현황, 박건용 책임연구원 (KINS)
15:00 ~ 15:30	Coffee Break
15:30 ~ 16:00	사고관리계획서 사업자 준비 현황, 양승태 팀장(KHNP)
16:00 ~ 16:30	주제 발표 스트레스테스트 규제검증 현황, 이현우 PM(KINS)
16:30 ~ 17:00	스트레스테스트 사업자 수행 현황, 윤봉요 팀장(KHNP)
17:00 ~ 18:00	Open Discussion 및 폐회

| 기타사항 - 등록비 : 무료(식사제공 없음)

- 문의처 : 김주홍 / 한국수력원자력 안전처 / 054-704-3255 / chaum1031@khnp.co.kr

## C

## 국내 원전 내진연구 기술협의체 워크숍

| 일시 · 장소 2019년 5월 24일(금) 13:30~17:30 · 제주 국제컨벤션센터, 3층 302

| 주최 한국원자력학회 원전건설 및 운영기술 연구부회

일 정	내 용
13:30 ~ 13:40	기술협의체 소개 및 회원동정
13:40 ~ 13:55	노화 배관시스템의 연계해석 및 지진응답 제어기술 개발 (조성국, 이노스기술)
13:55 ~ 14:10	내진설계/성능 방법론 개발 (김재문, 한국수력원자력)
14:10 ~ 14:25	지진 취약설비의 최적 내진성능 상향(0.6g) 기술개발 (구경회, 한국원자력연구원)
14:35 ~ 14:40	원전고주파 지진동 정밀 분석을 위한 고신뢰성 지진감시시스템 개발 (박정우, 우리기술)
14:40 ~ 14:55	원전 설계기준 재평가를 위한 '16.9월 지진 지진원 특성조사 (이진한, 고려대)
14:55 ~ 15:10	원자력발전소 전기1급 캐비닛의 지진취약도분석 프로그램 개발 (조성국, 이노스기술)
15:10 ~ 15:25	사용후핵연료 저장조(SFP)의 지진 안정성 평가 기술개발 (최청렬, 엘셀텍)
15:25 ~ 15:40	Break
15:40 ~ 15:55	원전 지진대응 역량강화를 위한 지진 단층특성 분석 및 내진성능 향상 원천기술 개발 (강태섭, 부경대)
15:55 ~ 16:10	확률론적 지진안전성평가(PSA) 리스크 정량화 기술개발 (박준희, 한국원자력연구원)
16:10 ~ 16:25	원전 안전1등급 기기에 대한 지진 후 간접성 평가기술 개발 (김광호, 프론틱스)
16:25 ~ 16:40	원전 지진리스크 평가를 위한 배관 비선형 해석모델 개발 (김선우, 마이다스아이티)
16:40 ~ 16:55	설계초과고주파 지진에 대한 원전구조물 기기내진성능평가 기술개발 (장수혁, 세니츠코퍼레이션)
16:55 ~ 17:10	원자력 구조물의 구조물-지반-구조물 상호작용을 고려한 지진응답 해석기술 개발 (장수혁, 세니츠코퍼레이션)
17:10 ~ 17:30	토의 및 정리

| 기타사항 - 등록비 : 무료 (식사제공 없음)

- 문의처 : 구경회 / 한국원자력연구원 / 010-2037-4108 / ghkoo@kaeri.re.kr

## D

## 안전문화 향상을 위한 도전과제와 발전 방향 모색

| 일시 · 장소 2019년 5월 24일(금) 13:30~16:50 · 제주 국제컨벤션센터, 2층 201A

| 주최 한국원자력학회 원자력정책, 인력 및 협력 연구부회/한국수력원자력

일 정	내 용
13:30 ~ 14:00	등록
14:00 ~ 14:10	개회사 (이명춘, KHNP)
14:10 ~ 14:40	강력한 원자력 안전문화 (강재열, 원자력산업회의)
14:40 ~ 15:00	Break 및 기념촬영
15:00 ~ 15:30	원자력 안전문화 규제감독 국내외 동향 (정수진, KINS)
15:30 ~ 16:00	PSR을 통한 안전문화분야 Insight 및 향후과제 (박강민, FNC)
16:00 ~ 16:30	한수원 안전문화 모델 개정 및 계층별 설문개발 (김영갑, KHNP)
16:30 ~ 16:50	토의 (좌장 : 한동대 조병욱 교수)

| 기타사항 - 등록비 : 무료 (식사제공 없음)

- 문의처 : 조혜연 / 한수원 안전계획팀 / 054-704-3223 / jjmoon0804@khnp.co.kr

## 연구부회/지부 활동 및 계획 발표회

| 일 시 2019년 5월 24일(금) 13:30 ~ 15:30

| 장 소 300호

시간계획	구분	발표자
13:30 ~ 13:35(05')	인사말	우승웅 부회장 (사회)
13:35 ~ 13:45(10')	원자로물리 및 계산과학 연구부회	김용희 연구부회장
13:45 ~ 13:55(10')	원자력시설해체 및 방사성폐기물관리 연구부회	정종태 연구부회장
13:55 ~ 14:05(10')	원자력 열수력 연구부회	김경두 연구부회장
14:05 ~ 14:15(10')	양자공학 및 핵융합기술 연구부회	김종원 연구부회장
14:15 ~ 14:25(10')	원전건설 및 운영기술 연구부회	이도환 차기 연구부회장
14:25 ~ 14:35(10')	원자력정책, 인력 및 협력 연구부회	이기복 연구부회장
14:35 ~ 14:45(10')	부산/울산/경남 지부	김희령 지부장
14:45 ~ 14:55(10')	학생지부	박재영 지도교수
14:55 ~ 15:05(10')	여성지부	강문자 지부장
15:05 ~ 15:30(25')	마무리	



## 교통편

| 제주 국제컨벤션센터 | 서귀포시 중문관광로 224 Tel. 064-735-1000



### 🚌 공항리무진 버스 (600번 제주공항 ↔ 중문관광단지)

운행표	공항 → 제주더호텔 → 여미지식물원입구 → 하얏트호텔 → 신라호텔 → 롯데호텔 → 한국콘도 → ICC JEJU
제주국제공항 출발 (06:20 ~ 22:00)	1층 5번 게이트 왼쪽 리무진 버스 승차장 (삼영교통 600번)
ICC JEJU	정문 국기게양대 20m지나 로터리 정류장에 정차 (600번 제주공항 ↔ 서귀포)
이용요금	공항에서 ICC JEJU까지 편도(성인) 4,500원 매 18~20분 간격 ICC JEJU까지 소요시간 50분

### 🚖 택시안내 (제주공항 ↔ 중문)

승차지점	이용요금	소요시간
장거리 택시 승차장에서 출발	약 3만원 (거리 약 40km)	약 40~45분

### 🚗 렌터카 이용시 (제주공항 → ICC JEJU)

경로	소요시간	이용노선
1코스 (1135번 도로 평화로)	차량 50분 소요 리무진 60분 소요	공항 → 신제주 → 제주경마장 → 평화로 → 중문관광단지 → ICC JEJU
2코스 (1139번 도로 1100도로)	차량 45분 소요 (초행길, 눈길, 안개조심)	공항 → 신제주 → 한라수목원 → 신비의 도로 → 어리목 → 탐라대학교 → ICC JEJU
3코스 (1131번 도로 516도로)	차량 1시간 10분 소요 (초행길, 눈길, 안개조심)	공항 → 삼성혈 → 제주대학교 → 성판악 → 돈내코유원지 → 16번도로 → 중문관광단지 → ICC JEJU



# MEMO

[illegible]

# MEMO

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# 한수원이 가장 잘 하는 일, 바로 에너지 채용입니다

원자력, 태양광부터 풍력, 수력, 연료전지까지 -  
깨끗하고 효율적인 에너지가 될 수 있다면  
그 어떤 무엇과도 함께 해왔습니다.  
앞으로 또 어떤 에너지가 가능해질까요?  
한국수력원자력이 만들어가는  
새로운 에너지를 기대하세요.  
종합 에너지기업 한국수력원자력



| 한수원, 깨끗한 에너지로 미세먼지 및 온실가스 저감에 앞장서고 있습니다 |



국민이  
안심하는 에너지를  
만듭니다.

안전을 최우선으로! 품질을 최고로!  
한전원자력연료는 국민과 함께 미래로 나아갑니다.



Safety First!  
Quality Best!

# 창립 50주년 기념 학술대회 전체행사 일정표

5월 22일(수)										5월 23일(목)										5월 24일(금)											
등록 (09:00 ~ 17:00)										등록 (08:00 ~ 17:30)										등록 (08:00 ~ 17:00)											
09:00-10:00	10:00-11:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00	18:00-19:00			09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00	18:00-19:00	09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00			
201A 2F										[4A] 해안로 및 원자력재료 구두발표										[4A] 해안로 및 원자력재료 구두발표								[4D] 안전문화 향상을 위한 도전과제와 발전방향 모색	201A 2F		
201B 2F										[4B] 해안로 및 원자력재료 구두발표										[4D] 해안로 및 원자력재료 구두발표										201B 2F	
202A 2F										[7A] 방사선 방호 구두발표										[8B] 방사선 이용 및 기기 구두발표										202A 2F	
202B 2F										[6A] 원자력 안전 구두발표										[6B] 원자력 안전 구두발표										202B 2F	
203 2F										[6D] 원자력 안전 구두발표										[6E] 원자력 안전 구두발표										203 2F	
삼다홀A 3F										[6G] 원자력 안전 구두발표										[6F] 원자력 안전 구두발표										삼다홀A 3F	
삼다홀B 3F										[8A] 방사선 이용 및 기기 구두발표																					삼다홀B 3F
한라홀A 3F																															한라홀A 3F
한라홀B 3F																															한라홀B 3F
3층 로비																															3층 로비
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탈라홀B+C 5F																															탈라홀B+C 5F
오션뷰 5F																															오션뷰 5F
이벤트홀 1F																															이벤트홀 1F

\* 창립자부 정기총회 : 5월 22일(수) 18:00 ~ 20:00





국민과 함께하는 60년 꺾방을,  
우리는 미래를 연구합니다.

원자력 기술 불모지에서 원자력 수출국이 되기까지,  
한국원자력연구원이 걸어온 60년은 국민의 믿음과 신뢰로 이룬 결실입니다.  
국민이 안심하는 안전한 원자력 기술, 삶의 질 향상을 위한 첨단 방사선 기술, 4차 산업 기술을 접목한 융복합 신기술,  
한국원자력연구원은 새로운 미래를 열어가겠습니다.

기술 자립의 첫걸음을  
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원자로 계통 및 핵연료 설계  
기술 자립비  
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[www.kns.org](http://www.kns.org)

## KNS 2019 Spring 창립 50주년 기념 학술대회

| 발행인 | 김명현

| 발행처 | 한국원자력학회

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[www.kns.org](http://www.kns.org)



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KOREAN NUCLEAR SOCIETY

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