Asian Nuclear Safety Network Education and Training Topical Group
Regional Workshop on the Management of Training Systems for Nuclear and Radiological safety
6-10 November 2023
PNRI, Manila, Philippines

Safety-first KINS, Always being trusted by public

Korea, Republic of

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Contents

I. Introduction of INSS

Introduction of INSS

Vision of International Nuclear Safety School

- World-best organization for education and training of nuclear safety

Main works of INSS : Four departments & One Project manager

Dept. of Education & Training

- Staff education development & training
- Stakeholder education development & training
- Competency development & management
- Inspector's qualification management
- KINS simulator education
- Licensee's education for requalification

Dept. of Education Faculty

- Education curriculum development
- Textbook development
- Domestic & international cooperation
- Operation KINS-KAIST mater's program
- Providing professional lecture

Dept. of Nuclear License Exam Management

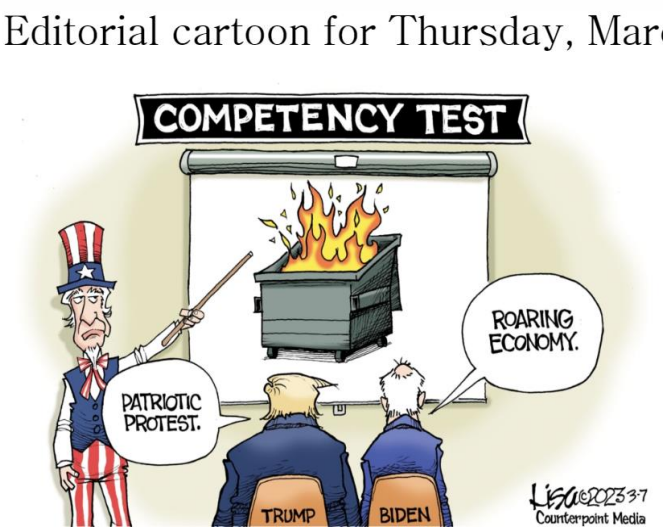
- Implementation & management of nuclear license exam
- Development of nuclear license exam question
- Issue NPP operator license
- License exam short-and-long-term plan

Dept. of Intelligent Information

- IT system development & operation
- Information network system management
- Management of cyber security & private information
- Management of open data
- Development of knowledge management

II. Systematic Management for Education

Starting-point : Competency

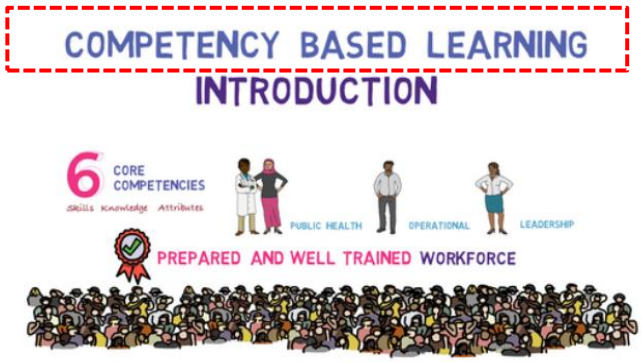


https://www.sunjournal.com/2023/03/09/editorial-cartoon-for-thursday-march-9/

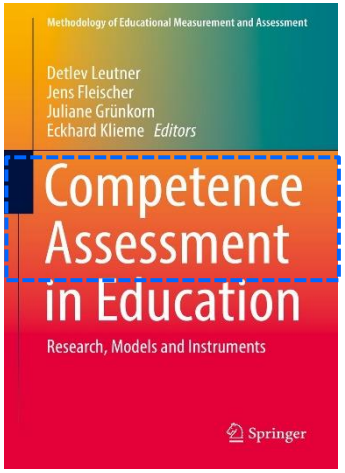
- Different viewpoint at same situation ??
- Competency is used at various fields !!

  - Learning, assessment, work etc

- With this background, KINS started to think and develop competency systematically.



https://openwho.org/courses/intro-competency

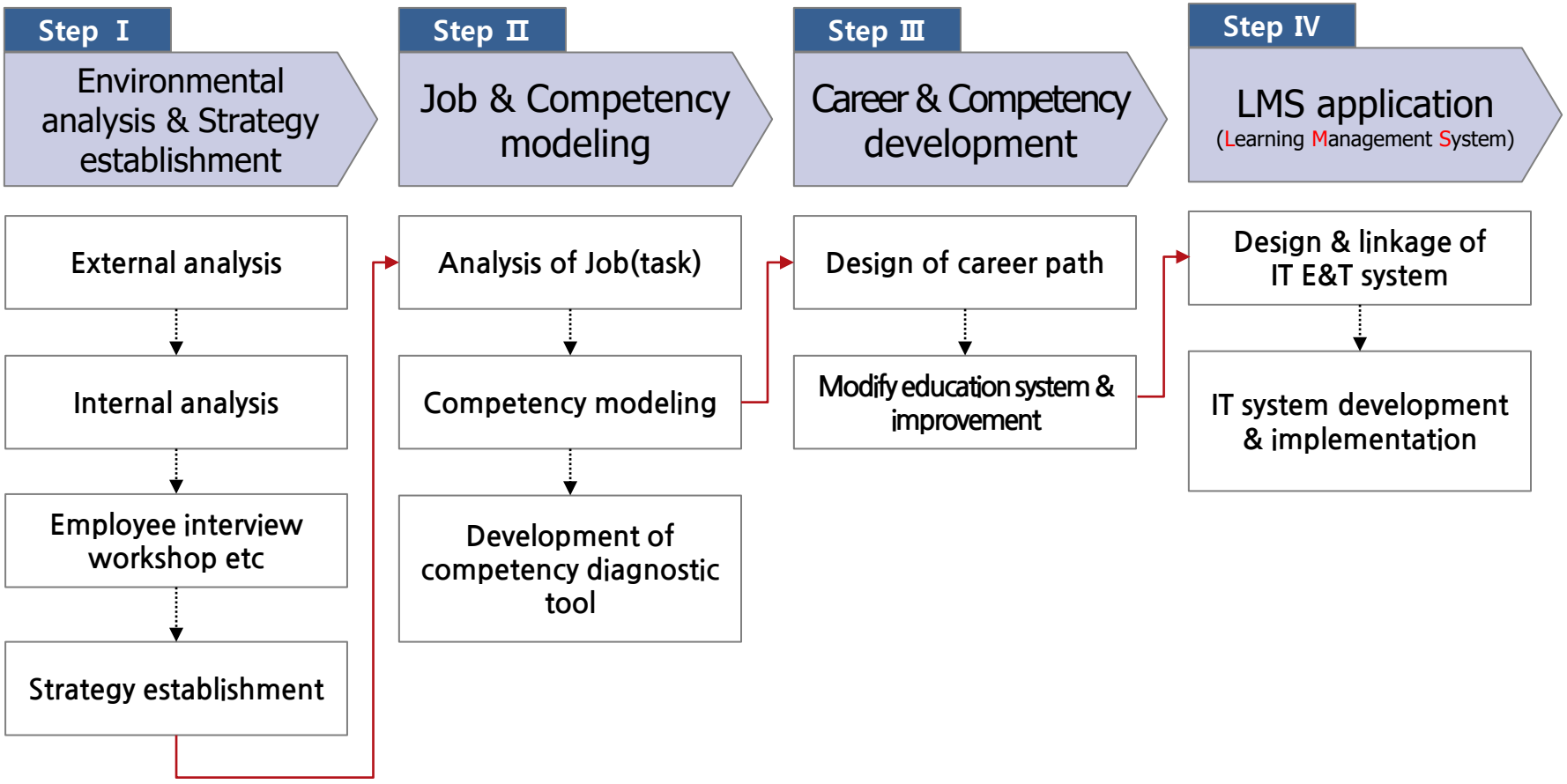


https://link.springer.com/book/10.1007/978-3-319-50030-0

https://johnsoncenter.org/wp-content/uploads/2021/03/Program-Officer-Competency-Model

Steps of Competency Development at KINS

Competency development & management



- (Objective) to enhance competency development for capacity of safety regulation at KINS

Main Product of Competency Development

Job analysis : competency model & competency dictionary

- Analysis of current classified tasks, survey task of stakeholder organization
- Competency model : basic, leadership, task competency
- Nuclear Inspector : 4 types (Nuclear facility, QA, radiation management, EPR)

Competency diagnostic tool

- Apply to behavioral observation scale(BOS) method by high performers

  - (Methods) use questionnaire for competency diagnosis

  - (Feedback) provide strong & weak competencies with participants

Career development path(CDP) & CDP map

- (Design) 3-level career(basic, mature, expert), 4-track path(managerial, professional, specialist, expert)
- (Map) guide individuals for ideal career path in order to set their CDP goal

competency dictionary(148 task, 10,000 ↑ competency)

Competency Diagnostic Questionnaire

Partial competency diagnosis questionnaire

fundamental Please check your usual action frequency based on below scale

Q1. I make an effort to follow our organization's value and moral view

○	○	○	○	○	○	○	○	○	○
1	2	3	4	5	6	7	8	9	10

Q2. I maintain objectivity and independence when I carry out my work

○	○	○	○	○	○	○	○	○	○
1	2	3	4	5	6	7	8	9	10

⋮

Leadership Please check your usual action frequency based on below scale

Q7. I work and make a decision individually without supervisor's support

○	○	○	○	○	○	○	○	○	○
1	2	3	4	5	6	7	8	9	10

Q8. I think and try to solve complicated problem or task

○`	○	○	○	○	○	○	○	○	○
1	2	3	4	5	6	7	8	9	10

⋮

SAT : Nuclear Inspector's Education Program

(Analysis) Survey inspector's E&T system of regulatory body at foreign country

- Survey inspector's E&T system of regulatory bodies (report number: KINS/RR-395*)

  * Development of a **competencies profile for the inspector** of the regulatory body for nuclear facilities **using SAT method**

- Main result of survey

  - (inspector) NRC inspector can be divide into basic & professional group
  - (education system) inspector must complete qualified E&T within 2-years period
  - (inspector type) 9 types* of inspector

    * Reactor operator, supplier, nuclear material, emergency preparedness & response etc.

(Design) Establish goal of education & direction based on analysis

- Design of education goal, direction, methods and contents etc.

  - (goal & direction) improve Inspector's competency and qualification management
  - (method) carry out classroom & on-line education
  - (contents) follow inspector's certification* and topics

    * Nuclear facility inspection, QA inspection, radiation inspection, emergency preparedness & response inspection

  - (evaluation & feedback) design evaluation & feedback system

    * Course accomplishment by attendee; requirement for pass : 60% score using CBT

SAT : Nuclear Inspector's Education Program

(Development) Preparation of curriculum and course

- Develop detailed curriculum and teaching materials
  - (curriculum of nuclear facility course) safety inspection & review, regulation issue etc.
  - (curriculum of QA) QA Inspection, law, code & standard, case study of inspection
  - (textbook & time) prepared by instructor & staff, a courses(3~6hrs) depending on course
- Effort to develop new courses and categorize attendance level
  - (Basic course for newcomers) understanding of nuclear facility system(2023)

(Implementation) Operate on & off education program

- Carry out two step of program operation, on/off-line class
  - (preparation in advance) notify education program to attendee, gadget check etc.
  - (implementation) operate and monitor education program, support instructor
  - (off-line class) usually operate off-line class (classroom)
  - (on-line class) open on-line class depending on topics

    * ex. Improve inspection interview skills, how to write effective inspection report etc.

SAT : Nuclear Inspector's Education Program

(Evaluation) Estimate educational achievement & satisfaction

- Carry out test, survey of satisfaction by attendee

  - (test) utilize CBT*, requirement for pass : 60% CBT score ↑

    * Mainly applied to job competency course, except leadership course, basic etc

  - (satisfaction survey) provide multiple choice & essay questionnaire

    * Survey contents : work application degree, lecturer's effort, lecture content, communication with lecturer

  - (satisfaction result) by Likert scale : score of 3.93 ~ 4.44 / 5, (2022)

(Feedback) Survey educational satisfaction and receive opinion

- Utilize attendee's feedback in order to develop high quality education

  - (satisfaction survey) analyze the result of survey and improve weak point

  - (website board) receive attendee's opinion by education website at anytime

Total Process of SAT for Inspector's Education Program

KINS/RR-395

체계적 훈련개발 접근법(SAT)을 이용한 원자력시설 규제검사원 능력요소 개발

Development of a competencies profile for the inspector of the regulatory body for nuclear facilities using the Systematic Approach to Training(SAT) method

2005. 12

한국원자력안전기술원

<Analysis : Research Product>

원자력검사원 일반과정 교육계획

1. 교육 목표
2. 교육 대상
3. 교육 내용
4. 교육일시 및 장소
5. 평가 및 설문
6. 기타 협조사항

<Design of Education>

첨부 : 교육과정별 시간표

원자력검사원 분야별 교육 시간표

원자력검사원 시설관리과정 시간표 (2022. 5.17(화))

원자력검사원 품질보증과정(2022. 5. 24(화))

<Development of Curriculum>

<Implementation>

시설관리 분야 검사원과정 결과보고

<Evaluation of Education >

시험지문항관리

<Achievement Test by CBT>

<첨부1>

시설관리 분야 검사원과정 설문조사결과

■ 과정만족도

■ 서술형 의견

<Questionnaire & Feedback>

III. Challenges, Networking & Plan

Digital Transformation(DT) at Korea

Global trend & Korea Government Policy for DT

- Global trend of DT

  - (Start) announcement of 4th industrial revolution('16 WEF)

  - (World) each country accelerate DT based on long-term plan

  - (Main technology) combination of AI and ICBM etc

  * **I**nternet of things, **C**loud, **B**ig data, **M**obile(ICBM), Metaverse(AR/VR etc)

DT education places at Korea, for public (about 1,330)

- Science & Technology(S&T) fundamental plan at Korea

  - (Establish) every 5 year for S&T development, top-level plan

  - (DT field) focus on AI technology, networking, big data etc

  - (HRD field) conversion of education infrastructure to digital

  * Main direction : edutech using Data, Network, AI(D.N.A), metaverse etc

5th S&T fundamental plan

VR application : Safety Education for Public

Practical experience for nuclear & radiation safety education

- Safety education for publics

  - (Objective) to reduce fear of nuclear facilities, KINS carry out nuclear safety education using VR, brochure, book, radiation protective equipment

  - (VR device) : approximately 3 minutes for each content

    · KINS VR consists of device & 3 contents(below)

    1) nuclear safety experience(main facilities, safety device, steam generator etc.)

    2) radiation emergency preparedness and response(scenario-based, evacuation etc.)

    3) periodic safety inspection(refuel loading process)

5 Barrier protection

Emergency response

Refuel loading process


안전교육기관 지정서

Designation document for KINS

Networking & Future plan

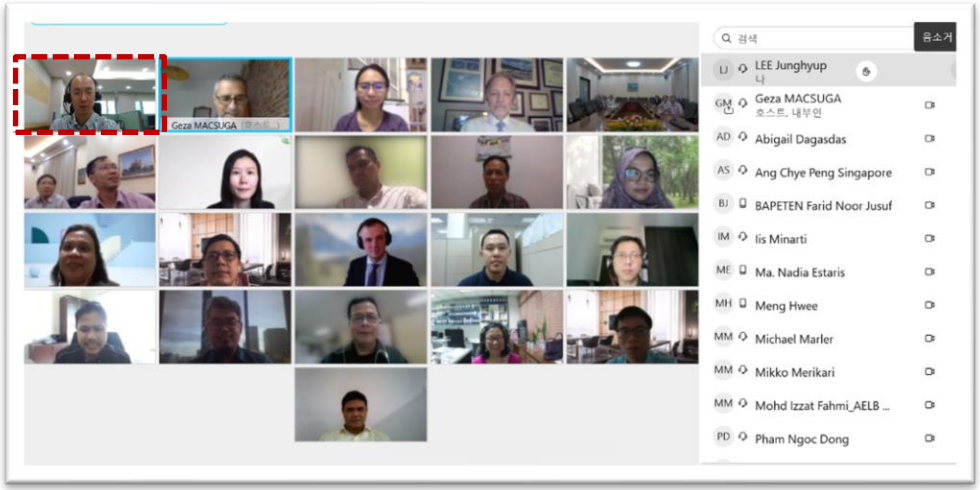
International cooperation continuously for HRD

- Participate in & host various meeting regularly
  - IAEA : Global region 1) ANSN, 2) Dept. of nuclear energy(Vienna) for HRD
  - ANNuR(Arab Network of Nuclear Regulators) : Arab region(22 countries)
  - FNRBA(Forum of Nuclear Regulatory bodies in Africa) : Africa region(28 countries)
  - TRM(Top Regulator Meeting) : Asia region(3 countries)

Introduction of new competency & demand analysis continuously

- Survey participants' educational demand & competency needs annually
- Continue to operate education program with respect to new technology
  - AI technology, SMR, regulatory policy, high level radioactive waste

Networking for International Cooperation



- ANSN Online Workshop(2021)

  - Tittle : Strategies for attracting and retaining personnel at regulatory bodies

- ANNuR Workshop on Radiation Safety

- FNRBA for IAEA BPTC

* ANNuR : Arabic Network Nuclear Regulators

* FNRBA : Forum of Nuclear Regulatory Bodies in Africa

Summary

- Develop competency analysis, competency modeling and diagnosis
  - Establish plan, analyze tasks, competency modeling and competency dictionary
  - Develop competency diagnostic tool and feedback to participants

- Design career development path, & educational system, develop LMS system
  - Design CDP procedure, CDP map and LMS based on competency development

- Apply SAT for nuclear inspector qualification & management

- Adopt new technology at KINS : VR

- International networking & future plan
  - Asia, Arab, Africa, Europe and beyond to the entire Global

Always we keep watching
our atomic power

Thank You

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