

Competencies Development: Education & Training

Ref: GR No. 11 Year 2017

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BATAN-JAEA
Steering Committee Meeting
Jakarta, August 1, 2017

- Manpower is an important element in planning, implementing and evaluating programs
- Education and training is one of aspects for competencies development
- The Act No 5/2014 and GR No. 11/2017 stipulates competencies development for all Government employees.
- Challenges: budget availability & aged employees.

Type of Competencies



TECHNICAL

- Education
- Function/technical trainings
- Experiences

MANAGERIAL

- Education
- Management training
- Leadership experience

SOCIAL-CULTURAL

- plurality in social-cultural environment



Mandatory
20 lesson-hours annually
Planned annually by the Institution

Mandatory

20 lesson-hours annually

Planned annually by the Institution

Education

Formal education

Domestics/Foreign Universities

Training

Clasical: Face to Face

Non Clasical: *e-learning*, mentoring, distance learning, coaching, etc.

Policies on Education



- Supporting national/BATAN program
- On critical knowledge
- Utilizing various financial resources

Universities with Nuclear Subjects



○ With specialization in NE

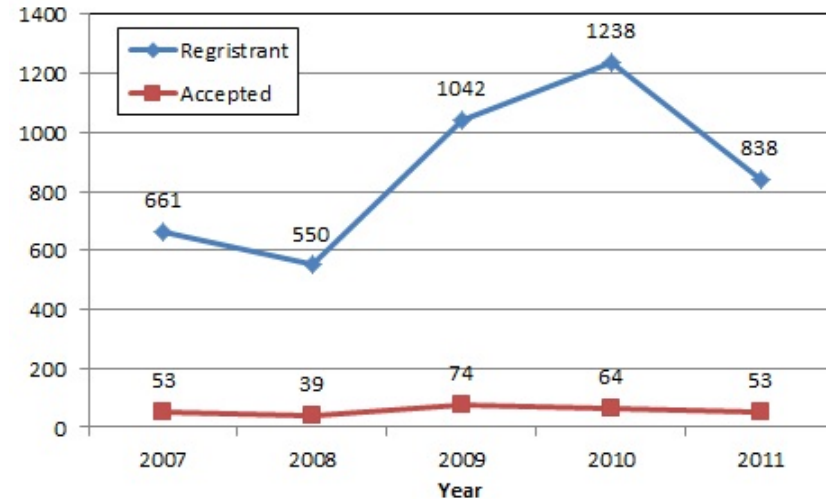
- University of Indonesia (UI)
- Bandung Institute of Technology (ITB)
- State University of Sebelas Maret (UNS)
- University of Diponegoro (UNDIP)
- University of Gadjah Mada (UGM)

○ Nuclear Department

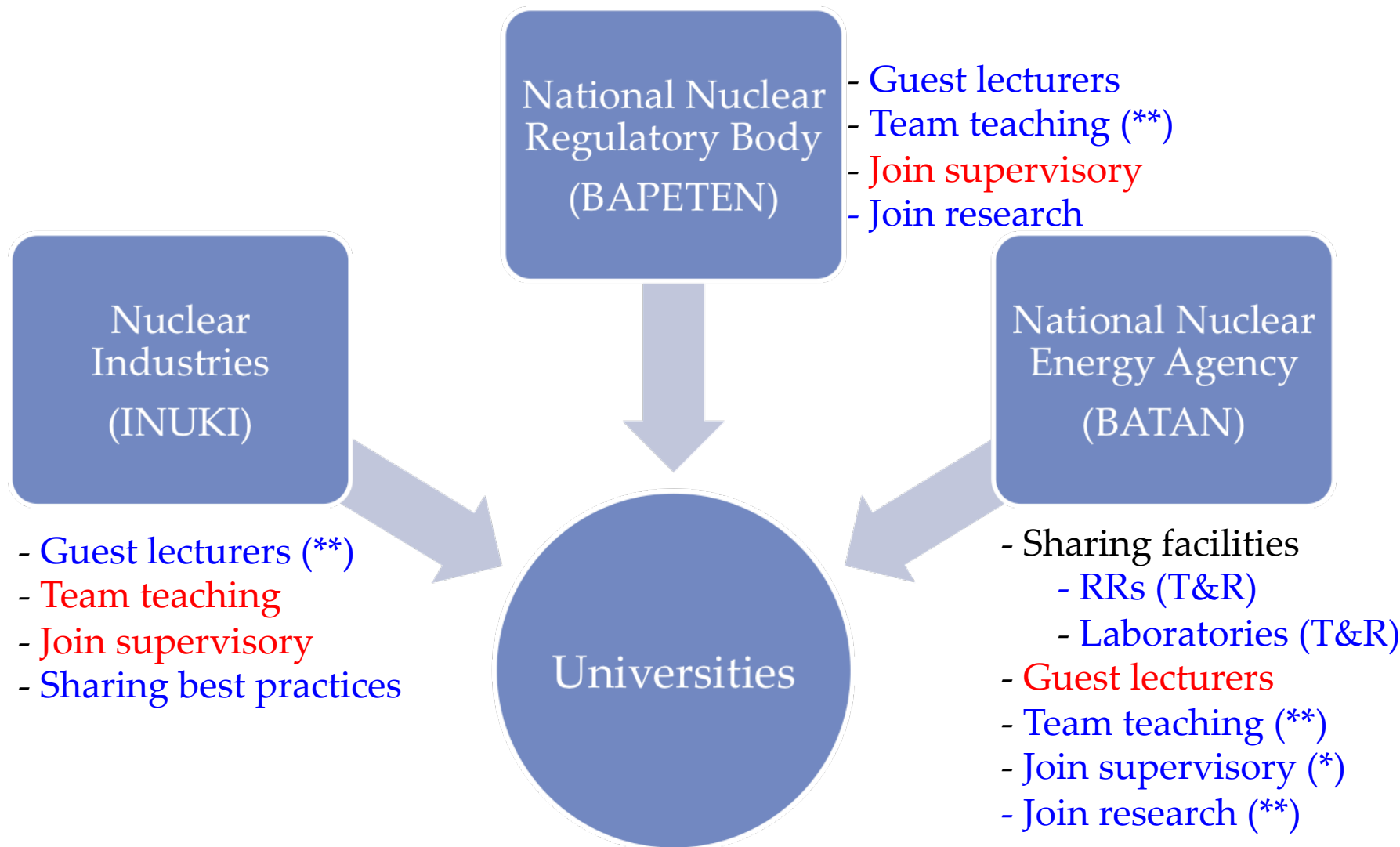
- NE & Eng. Physics @UGM
- STTN (BATAN)

- Study programs: 2
 - Engineering Physics (480 students)
 - Nuclear Engineering (212 students)
- Faculty members: 32
 - Professor: 1
 - Associate Professor: 3
 - Assistant Professor: 26
 - Lecturer: 2
- Laboratories: 4
 - Technology of Nuclear Energy
 - Technology of Process & Nuclear Chemistry
 - Technology of Renewable Energy
 - Technology of Sensor & Telecontrol

Intake of NE at UGM



National Supports for NE Education



(*) already conducted by several research center

(**) seldom and need to be enhanced

- Scholarship Program for Master/Doctorate degrees:
 - Scholarship Program of BATAN,
 - Scholarship Program of Ministry of Science, Technology and higher Education for pursuing degrees in domestic universities,
 - Scholarship Program of Ministry of Science, Technology and higher Education for pursuing degrees in foreign universities,
- Scholarship Program of BATAN for high school graduates to pursue degrees in domestic universities.

- Manage for all employees
- Prioritizes (*grading model*)
- Modalities of classical and non-classical
- Use learning material of partners: IAEA, JAEA
 - e-learning IAEA and others

Grading Model



Elements	Value	Alternative Value
National Program	5	8
Lead to Certification	5	7
International Cooperation	4	6
Potential Loss of Knowledge	4	5
Program of BATAN	4	4
Program of Centers	3	3
Program for Dissemination/ Outreach	2	2
Other	1	1

Modalities for Training



No	Program	Bukti	Penyelenggara	Penandatanganan
1	Pendidikan	ijazah	Lembaga Pendidikan formal	Penyelenggara
2	Pelatihan Luar BATAN	Sertifikat	Lembaga Eskternal	Penyelenggara
3	Pelatihan Reguler di BATAN	Sertifikat	Pusdiklat	Kepala Pusdiklat
4	Seminar	Sertifikat	Unit kerja/Panitia	Penyelenggara
5	Kursus	Sertifikat	Lembaga Eskternal	Penyelenggara
6	Penataran	Sertifikat	Lembaga Eskternal	Penyelenggara
7	Lokakarya/Workshop Eksternal	Sertifikat	Lembaga Eksternal	Penyelenggara
8	Lokakarya/Workshop Internal	Sertifikat	Unit Kerja BATAN	1. Kepala Unit Kerja, 2. Kepala Pusdiklat
9	Praktik Kerja/Pemagangan Eksternal	Sertifikat	Lembaga Eskternal	Penyelenggara
10	Praktik Kerja/Pemagangan Internal	Sertifikat	Unit Kerja BATAN	Kepala Pusdiklat
11	Pelatihan Selingkung	Sertifikat	Unit Kerja BATAN	Kepala Pusdiklat
12	Penugasan (<i>Developmental Assignment</i>)	Sertifikat	Unit Kerja BATAN	>= 40 JP Kepala Pusdiklat
13	<i>Knowledge Sharing</i>	Sertifikat	Unit Kerja BATAN	>= 10 JP Kepala Pusdiklat

Categories of Competence



Hard Competencies

Soft Competencies

Grouping of Training



National Program

- Energy
- STP/ATP

Lead to Certification

- Operator of Reactor
- Supervisor of Reactor
- Maintenance of Reactor, etc.

International Cooperation

- IAEA
- JAEA
- US DoE
- US PNS
- Others

Dissemination / Outreach

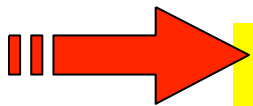
- Teachers/ Lecturers
- Students
- Media

Baseline: English, Scientific Writing

Training Activities



- In house training:
 - ▶ BATAN staff
 - ▶ Public
 - ▶ Regional/Interregional



In average 90 TC per year

Training Activities for Public

- Radiation Protection for Industry
- Radiation Protection for Medics
- Radiographic Technique Level I
- Radiographic Technique Level II

- Introduction of Nuclear Science and Technology for High School Teachers
- Radiochemistry for University Students
- Supervising a university in developing and implementing Medical Physics major

Training for Stakeholders



- Introduction of nuclear technology for school teachers
- Introduction of nuclear technology for journalist
- Introduction of nuclear technology for local government and legislative representative
- Introduction of nuclear technology for local community
- Trainings designed for university students in conjunction with university lectures (ex. Radiochemistry, etc.)

Training for BATAN Employee and expect Stakeholders to attend



- Radiation measurement and nuclear spectroscopy
- Measurement of Environmental Radiation
- Emergency preparedness and response
- First responder
- Emergency mitigation for off-site area
- Nuclear analytical techniques for air pollution
- Reactor engineering and safety, etc.

Training Scheme Research Reactor Personnel

Specialization	Topic of Trainings		
	Basic ~ 3 years	Junior 3 ~ 6 years	Senior 6 ~ years
Operation	Radiation Protection	Reactor Operator Reactor Kinetics and Dynamics Thermohydraulics Reactor Heat Transfer	Reactor Supervisor Radioactive waste management Safety of Installation Operation Reactor core modelling
Maintenance	Radiation Measurements Working Health and Safety	Operator of Maintenance Reactor Reactor Instrumentation System Reactor Controlling Technique	Supervisor Maintenance Reactor Safety of Installation Operation Design Reactor Control System
Safety	Basic of Nuclear Safety Safety Culture	Radiation Protection Officer Radioactive waste management Accounting of Nuclear Material Health and Safety Specific (Thermal, Electric, Mechanic etc)	Nuclear Safety Management Safety of Installation Operation Human Performance

Network of Cooperation



- **Multilateral: IAEA**
 - Internet Reactor Laboratory (IRL): Through an internet connection, the control room and a research reactor can be linked visually to a distant classroom for the purpose of explaining reactor physics and conducting experiments interactively.
 - IRL is under consideration for the purpose of regional cooperation in education and training in under IAEA program
- **Bilateral: JAEA, US DoE; US PNS (DoS)**
- **Regional: FNCA, ANENT, ANSN, NSSC, ICTP**
- **Domestics: Bapeten, UGM, UI, UNS, UNAIR, ATRO Bali.**

- Development of Training Laboratory for Safety
- Development of Planning for ToT on Nuclear Safety Infrastructure of NPP/RR and Nuclear Facilities
- Knowledge Retention Strategy for Safe and Secure Research Reactor Operation and Maintenance
- ToT on Nuclear Safety Infrastructure of NPP and Nuclear Facilities
- ToT on Safety Analysis of Reactor
- Review of Knowledge Retention Strategy for Safe and Secure Research Reactor Operation and Maintenance
- ToT on Safety Analysis of Reactor
- Core Calculation using SRAC/MCNP Program
- PSA Level III using Computer Code

- Training needs analyses for all competencies fields
- Analysis of critical knowledge
- Analysis of potential of knowledge loss:
 - related to operation and safety of research reactors
- Setting Priorities (*grading model*)
- Communication with international partners

Terima Kasih



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