Andrey Pryakhin, Georgy Tikhomirov

Strategic academic unit as a synergy between education, research and innovations and its position in knowledge life cycle
Plan of appearance

1. MEPhI is the leading University in Russia
2. Scheme of the world-class University
3. Transformation of the structure of MEPhI, Strategic Academic Units
4. Institute of Nuclear Physics and Engineering (INPhE) – creation objectives, approaches to implementation
5. The life cycle of knowledge. The specifics of the nuclear industry.
6. Examples of projects of the IAEA and NEA/OECD in the preservation of nuclear knowledge, which are used in the educational process of INPhE
7. Place of INPhE (University) in the life cycle of nuclear knowledge
Outstanding Soviet physicists and the USSR Atom Project leaders participated in MEPhI development; 6 Nobel prize winners were among its staff.
NATIONAL RESEARCH NUCLEAR UNIVERSITY «MEPhI»
Physics & Engineering
Education & Research & Industrial Innovations

120 Foreign Professors

900 Professors

20 Regional Universities and colleges

900 Foreign students

20 000 Students overall
Elements of the Web’s Next Generation

Diagram of World-Class University

The Challenge of Establishing the World Class Universities. / Jamil Salmi.
Strategic Academic Units (SAU): Improving sustainability and autonomy.

Key principles of SAU:
- High autonomy of SAU in the decision-making
- Investing in talents
- Academic mobility
- Well-developed research infrastructure

Examples of objectives and instruments:
- Each SAU is operating in conditions of self-sufficiency, as a research and educational unit
- Transformation of SAU into an international platform for knowledge exchange
- Resource centers for collective use

Strategic academic unit as a synergy between education, research and innovations.
INSTITUTE OF NUCLEAR PHYSICS AND ENGINEERING

GLOBAL CALLS
- COMING REVOLUTION IN PARTICLE PHYSICS
- NEW FORMS OF ENERGY AND TECHNOLOGY
- SAFETY OF NUCLEAR ENERGY
- RADIOACTIVE WASTE AND ECOLOGY

Center of Fundamental research and particle physics
Center for Nuclear systems and materials
Center for Nuclear power engineering

PARTNERS

Foreign scientific and educational centers
- MIT
- FAIR
- enen
- Oak Ridge National Laboratory
- Los Alamos National Laboratory
- Argonne National Laboratory
- Texas A&M University
- DESY
- NICA
- KEK-Japan

Industrial partners
- IAEA
- ITER
- ROSATOM
- Prontex
- NEA
- ROKOCMOC
Knowledge life cycle

- Knowledge
- People
- Resources

The Past
- Development of technology
- Opening of an effect

The Present
- Knowledge in universities
- Knowledge of only narrow professionals

Future
- Aging of technology
IT-projects in the nuclear industry

International Atomic Energy Agency (IAEA)
  – International control of nuclear technology
  – Coordination of education
  – International database (portal NUCLEUS)
    • INIS (international nuclear information system)
    • PRIS (Power Reactor Information System, database on power reactors in the world)
    • ....

Nuclear Energy Agency (NEA OECD)
  – Nuclear database (JANIS)
  – Database of programs in the nuclear field

Computer center for radiation safety (RSICC)
  – Database of programs and tests in nuclear industry
  – Technical support of programs of the United States
Purposes of application of databases in NRNU MEPhI in the field of nuclear technology

• Learning through activities

• Youth involvement in nuclear subjects

• Use of modern information technologies

• Classification and preservation of knowledge on nuclear technologies
“Nuclear” databases in the learning process of INPhE

JANIS – program of nuclear data demonstration ENDL (ENDF/B-VI.8, JEF-2.2, JEFF-3.0, JENDL-3.3) libraries of evaluated nuclear data NUBASE-2003 evaluated properties of nuclei EXFOR – database of nuclear reactions

IHECSBE – data base of evaluated critical experiments (benchmarks)

PRIS – database of power reactors
Place of the University in the promotion of IT projects

Computer, on which the Internet was invented
Tim Berners-Lee, 1989
(Museum CERN)

Leading researcher of the Laboratory of Informatics and artificial intelligence (CSAIL) at the Massachusetts Institute of technology (USA), Professor at the University of Southampton (UK)
Fruitful many years cooperation was reinforced by the signing Practical Arrangements in 2012

NRNU MEPhI is a point of the Russian localization of the IAEA Cyber Learning Platform CLP4NET to support national and international educational activities and trainings.

- Cooperation in the implementation of initiatives and efforts related with education and training in the nuclear field: STAR-NET network, INMA Academy;
- Cooperation in the field of Nuclear Security and assurance;
- Cooperation in the development of innovative and modern technology of education in the nuclear field: virtual labs, simulators of VVER and TA, school laboratories for CIS at the physics and safety of nuclear power plants;
- Cooperation in the planning and implementation of activities of the IAEA in collecting and preserving information on peaceful use of nuclear science and technology through the Russian center of International nuclear information system (INIS);
- Participation in the work and support expert missions and assist in the organization of the provision of laboratories and staff for probations.
Conclusions

1. The life cycle of nuclear knowledge can be influenced by introducing nuclear databases (IAEA, NEA/OECD, Rosatom) in the educational process of specialized universities.

2. The use of nuclear databases of IAEA, NEA/OECD, Rosatom in the educational process of MEPhI makes for the preservation of nuclear knowledge.

3. For effective preservation of nuclear knowledge we think necessary to involve lecturers of specialized universities in the development of nuclear databases and to provide for the development of training materials.
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«Perhaps, in utilizing our human capacity to build on the foundation of generations before us, we have inadvertently become so focused on our own building that we have forgotten the foundation that holds it up; or in reaping for so long where we have not sown, perhaps we have forgotten the need to sow.»

Stephen Covey