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Knowledge Management in the Development and Use of Radiation Technologies

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The Main Sources of Risk by Use of Radiation Technologies

No	Risk	The Main Causes of Risks
1	Personnel Irradiation	Violation of (the absence) of protection from radiation, no alarm, free access to the zone, errors in calculations, etc.
2	Loss of Radiation Sources	The absence or poor quality of sources monitoring in use, storage and transportation; lack of technical means to prevent their loss.
3	Decompression of Radiation Sources	Invalid physical load on the sources, use of sources over a specified period of service.
4	Redundancy/deficiency of radiation exposure to Object	Incorrect methodology, human error, the failure of executive mechanisms, disadvantages of industrial dosimetry etc.

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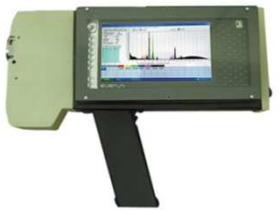
JSC NIITFA - Development and Use of Radiation Technologies

Medical Equipment

Radiation Technologies

Radiation Instrumentation



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Radionuclide Sources of Energy

Gas-Charge Radiation Detectors

Utilization of Radiation Hazard Objects

Critical Knowledge Management in JSC «NIITFA»

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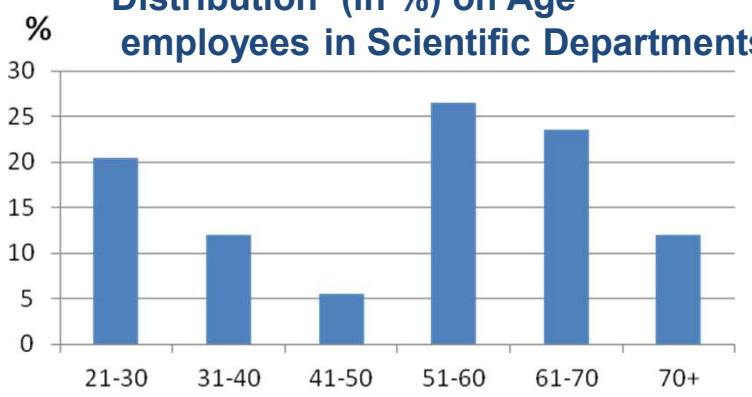

Estimation of the overall risk of knowledge loss

5	10	15	20	25
4	8	12	16	20
3	6	9	12	15
2	4	6	8	10
1	2	3	4	5

The age factor x factor workplace = total risk factor

- The IAEA has long enough drew attention to the problem of the "graying" of the labor force, when most of the currently running specialists can over the next few years get right to retire due to reaching retirement age. In this connection, we must have young employees, planned as successors in that specific area and time for the development of necessary level of knowledge and classification mastering.
- The analysis shows that a basic knowledge in institute belongs to employees over the age of 50 years. More than a third of employees have reached retirement age, and may at any time retire.
- Methodological materials of IAEA [2] propose to estimate the risk of loss of knowledge by determining the cumulative risk factor for each individual in the organization .
- Cumulative factor is determined by the expected date by the employees quit the organization (due to retirement, transfer to another job or for another reason - the so-called age factor or risk layoffs - it has a value from 1 to 5) and degree of importance of knowledge and skills of the individual (called a risk factor of the workplace, estimated values from 1 to 5).

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Preservation and Trans of Knowledge in Radiation Safety Management

Methods of Risk Elimination

Employee

Training

Education

Experience

Knowledge

Professional

Attitude to work

Competent Worker

Accounting of fixed sources of danger

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Preservation and Transfer of Knowledge in Radiation Safety Management

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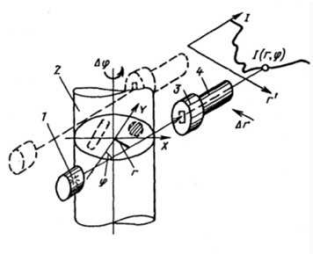
Preservation and Transfer of Knowledge



Preservation of critical knowledge in institute takes place in three ways:
- **First**, by digitization of scientific, technical, patent and design documentation. This work has already been done by more than 3,000 documents: technical reports, patents, articles and monographs of the Institute employees, periodic collections - works of the Institute
("Radiation Technology " and "Problems of Atomic Science and Technology", a series of "Radiation Technology " and "Technical Physics and Automation "), scientific-technical and design documentation for virtually the entire period of the Institute activity.
- Secondly, the knowledge and experience of individual specialists transferred to successors (in addition to the reports and publications in scientific and technical literature), the most effectively – through working together on themes on research and development of methods and technical devices, by preparation of theses and dissertations. In such a way,
Knowledge is transferred, for example, in the development in the Institute of gamma-therapeutic complex.
- **Third,** one of the modern methods of preserving knowledge is to create a multimedia product, when expert, the carrier of knowledge, records the information on progress, successes and challenges in the work, methods of its overcoming, information on scientific and methodological and technical achievements throughout his creative life, the necessary data on scientific and technical reference books, which can later help followers to create new methods and devices. Such multimedia product was prepared in the institute on the base of the experience of the development of gamma irradiation installations, in particular for sterilization of medical products .

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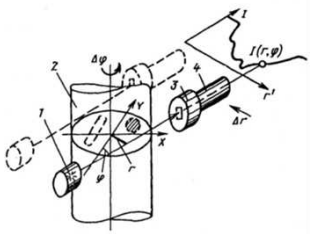
Knowledge management in creating and safe use of radiation technologies (RT)

Knowledge Receive → Knowledge Preservation → Critical Knowledge Transmission → **The use of Critical Knowledge when Creating RT** → The Result: Effectiveness and Safety

Organizational Matters

Knowledge Base of Organization

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Thank you for your attention