

MANAGING NUCLEAR KNOWLEDGE

ROLE OF IAEA AND ITS TECHNICAL COOPERATION PROGRAMME

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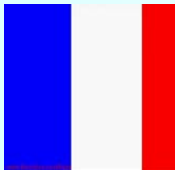
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“Like water, the rising tide of data can be viewed as an abundant, vital and necessary resource. With enough preparation, we should be able to tap into that reservoir – and ride the wave – by utilizing new ways to channel raw data into meaningful information. That information, in turn, can then become the knowledge that leads to wisdom.”

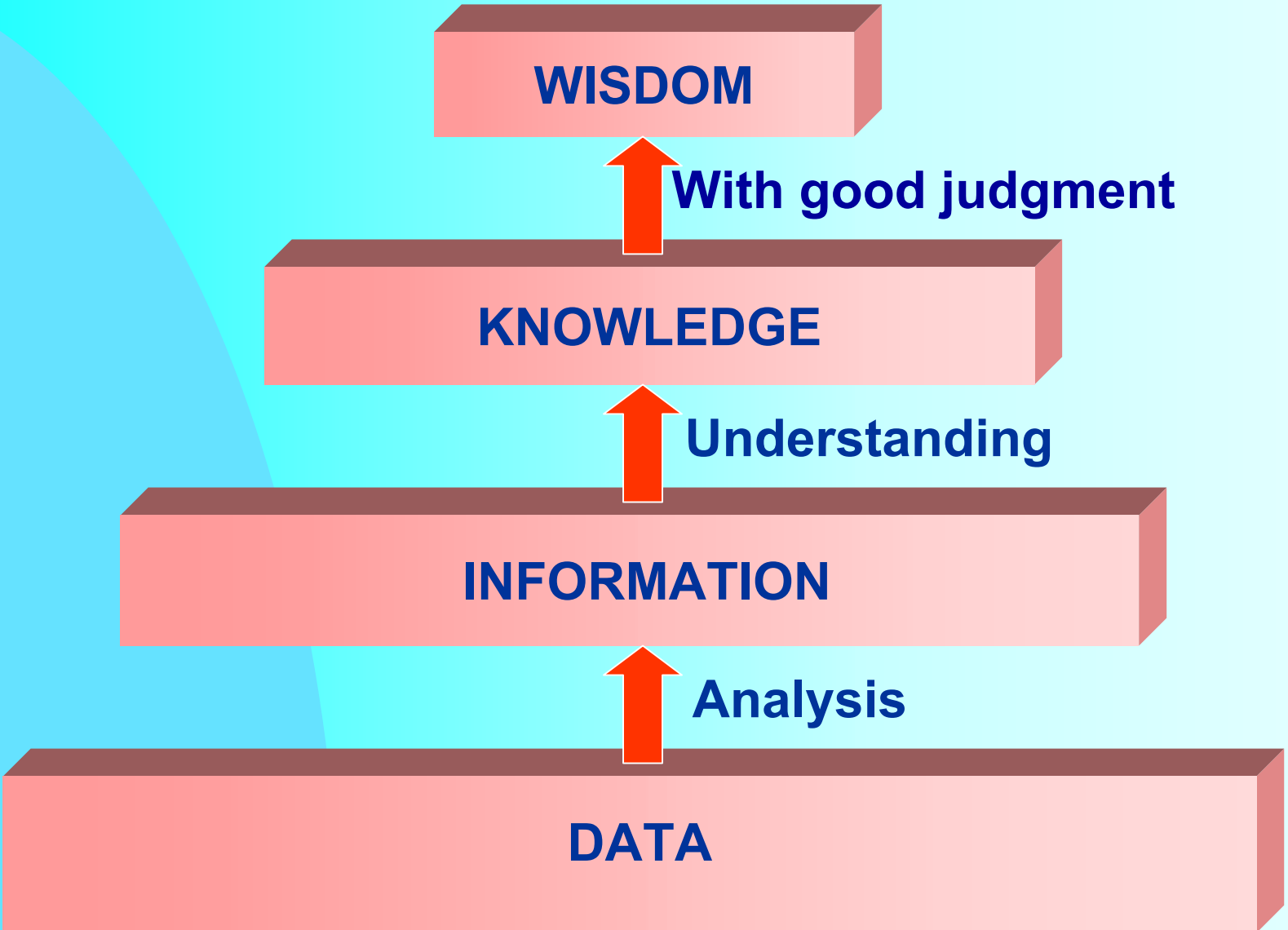
L. Alberthal

“Our knowledge is the amassed thought and experience of innumerable minds”.

Ralph Waldo Emerson

“Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it”.

Samuel Johnson



WISDOM

With good judgment

KNOWLEDGE

Understanding

INFORMATION

Analysis

DATA

Creation Transfer and Utilizations of Knowledge

**Information/Data
(explicit Knowledge)**

**Skills, Ideas, Intuition,
motivation
(tacit knowledge)**

Knowledge

Transferred as
Information

Assimilation
Adaptation
Adoption
(Triple-A Process)

Transferred information
is converted as
Knowledge

Utilization

Nuclear Knowledge

Nuclear knowledge is multidisciplinary and vast;

Includes all core disciplines such as Physics, Chemistry, Biology along with Mathematics and Statistics and applied fields includes:

- **Engineering**
- **Geology**
- **Information Technology**
- **Agriculture**
- **Hydrology**
- **Biotechnology**
- **Medicine**
- **Environmental sciences**
- **Nanotechnology etc.**

Is fully capable of making important contributions to meet global needs of energy, food, water, health and other sectors

Nuclear Knowledge Management

- **Capturing and storing relevant data and information - Maximising Digital Compression of Information;**
- **Developing effective linkages amongst various information bases;**
- **Maximizing conversion of tacit knowledge as explicit knowledge by:**
 - encouraging senior professionals to write;
 - facilitating senior professionals to give recorded seminars, talks and interviews;
 - mentoring of younger colleagues through interaction with senior professionals.

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Nuclear Knowledge Management

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Organizing international information services and ensuring information flow to national networks, especially in the LDCs through the internet;

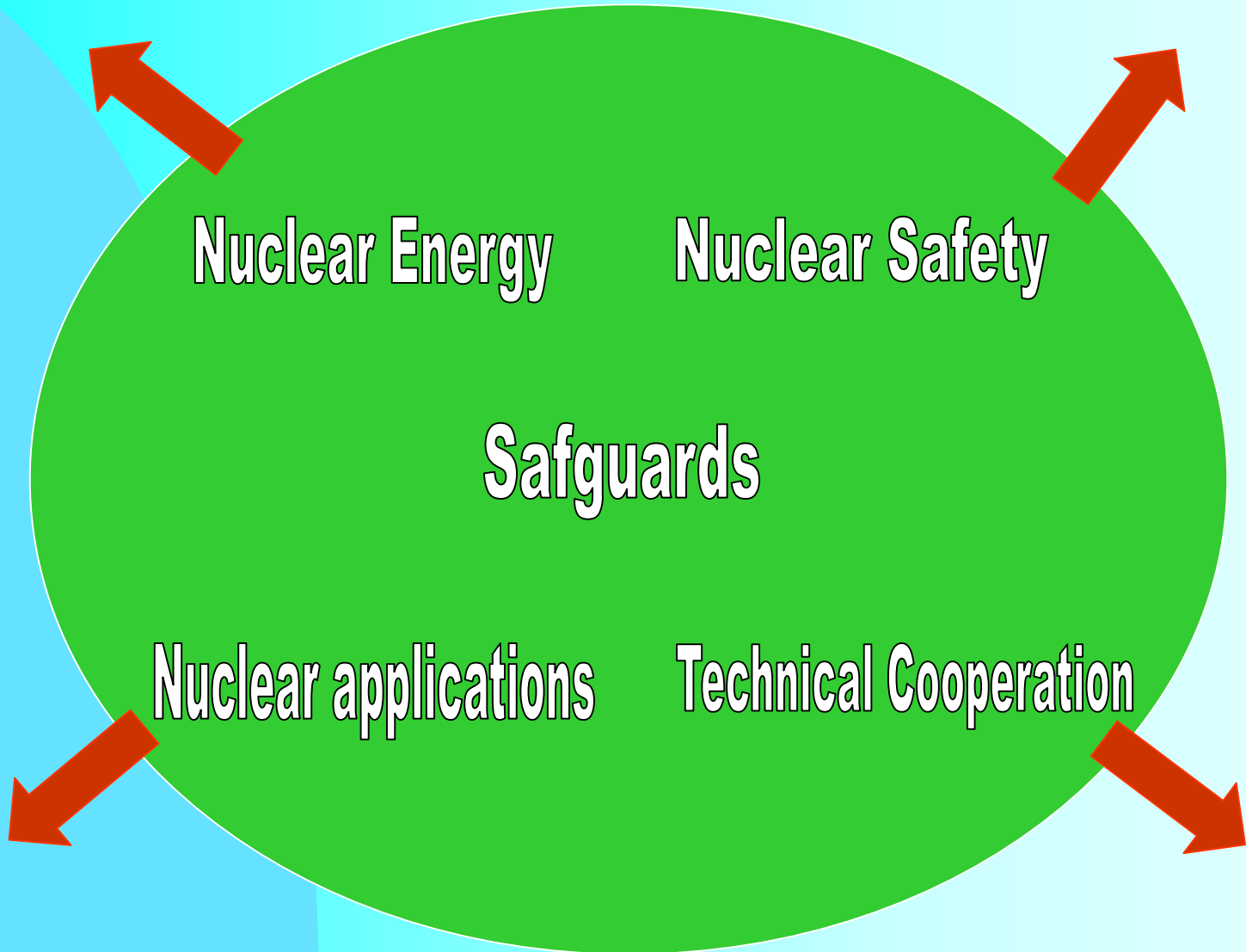
Helping to build national capacity to use information for practical applications;

Encouraging knowledge management culture at local, national and international levels;

IAEA

- The IAEA is mandated to accelerate and enlarge the contribution of atomic energy to peace;
- Establishing Nuclear Safety and Radiation Standards;
- Verification Regime for Safeguards;
- Operating International Nuclear Information Services (INIS) etc.
- Energy Planning etc.;
- Agency has made valuable contribution in helping developing countries to use nuclear techniques for:
 - *Increasing Agricultural Produce*
 - *Developing Water Resources*
 - *Improving Industrial Activities through Quality Control*
 - *Introducing Nuclear Medicine and Radiotherapy for health*

IAEA



Nuclear Energy

Nuclear Safety

Safeguards

Nuclear applications

Technical Cooperation

Overview of Various Departments of IAEA with the perspective of NKM

Department of Nuclear Energy

- manages INIS
- engaged in the all important work of preserving knowledge relating to fast reactors, decommissioning, management of high active waste etc.,
- keeps a tab on frontier areas of innovative designs of fission reactors and controlled nuclear fusion,
- organizes meetings on Nuclear Power and Nuclear Fuel Cycle

Geared for Managing Nuclear Knowledge in an area where need and urgency are obvious

Contd./

Overview of Various Departments of IAEA with the perspective of NKM

Contd./

- **Department of Nuclear Safety**

- has developed standards in nuclear safety and guidelines for radiation protection;
- helped establish an Asian Nuclear Safety Network (ANSN) for sharing nuclear safety knowledge.

These initiatives have linkages with Nuclear Safety Knowledge Management

Contd./

Overview of Various Departments of IAEA with the perspective of NKM

Contd./

- **Department of Nuclear Applications**

- promotes nuclear applications, and
- undertakes coordinated research projects enabling sharing of knowledge on specific topics to Member States
- Operates Research Centers/Laboratories;
- Conferences and meetings in various areas of nuclear applications

Need of some proactive incorporation of systemising Nuclear Knowledge practices and approaches in all the varied activities of Nuclear applications

Contd./

Overview of Various Departments of IAEA with the perspective of NKM

Contd./

- **Department of Safeguards**
 - **Inherent confidentiality of activities;**
 - **Essentially inward focused;**

*Realisation of an effective capture and storage
of nuclear safeguards related knowledge*

Overview of Various Departments of IAEA with the perspective of NKM

Contd./

- **Technical Cooperation (TC) Department**
 - supervises and manages Agency's programme to promote overall transfer of technology and know-how for development;
 - Played key role in developing nuclear programmes in most of the developing world;
 - Orientation towards achieving development goals;
 - Recently induced self-reliance as an important theme in overall TC programme which requires developing human resource and focused capacity building.

NK at IAEA

- **All departments of IAEA are engaged in developing and sharing Nuclear Knowledge**

Further Strengthening of NKM at IAEA

- Nuclear knowledge can keep growing only if the world's scientific youth are attracted to it;
- The Agency may help develop the World Nuclear University and develop linkages with national nuclear educational institutions;
- Use may be made of remote learning technology with access to Advanced Digital Libraries;
- strengthening and modernizing of INIS by way of consolidating its data/information base through linkages with WANO and similar nuclear information resources

Contd./

Further Strengthening of NKM at IAEA

Contd./

- Forge a closer relationship with the International Nuclear Society as well as national nuclear societies particularly for sharing of tacit Nuclear Knowledge;
- Strengthening NKM culture amongst Member States;
- Special Nuclear Knowledge Fund to coordinate in-house NKM within the Agency and in Member States.

NKM & Technical Cooperation

- Nuclear Technology is highly knowledge intensive;
- TC should ensure effective knowledge sharing in its activities;
- Nuclear Techniques which have an edge over other techniques may be usefully offered;
- Matching Nuclear Technology to the specific needs of Member States;
- Adequate supply of desired technical information along with equipment & expert services;
- To transfer Nuclear Knowledge, HRD should undertake “Triple –A” process – Adequately groom researchers in transferring information to knowledge by adaptive research & application and;
- supporting the development of high level multidisciplinary nuclear professionals on a sustainable basis in the developing countries.

Successful completion of TC projects should provide what needs to be done to apply knowledge

***“Those who cannot remember the past are
condemned to repeat it.” –***

George Santoyana.

Looking Ahead

- Human errors in accidents are directly or indirectly traceable to lack of knowledge of the operator or inadequacies in the process and operational system;
- Great advances in the last two decades have helped modify and improve the designs and operational safety of nuclear power plants;
- In recent years, the economics of nuclear power plants has also improved remarkably.

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- Nuclear energy already offers a unique option for assured world energy supplies at affordable cost, without burdening the atmosphere with greenhouse gases;
- In order to realize the Nuclear Future, it is essential to manage and mobilize nuclear knowledge for public awareness and education;
- As nuclear knowledge is shared and it grows on a global scale, we may look beyond nuclear knowledge to Nuclear Wisdom.

Conclusions

It is essential to manage and mobilize Nuclear Knowledge which is the common heritage of Humankind. It is the collective responsibility of all those who are knowledgeable in Nuclear Affairs to prevent its misuse;

Let us follow the example of this great country where we are meeting. France has demonstrated that the Nuclear Knowledge, if managed well, can contribute to economic strength.

**Equality in Knowledge and
peaceful use of Nuclear Knowledge**