

# Department of Nuclear Safety and Security



**IAEA**

*Atoms for Peace: The First Half Century  
1957-2007*

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- Changing World and Challenges to the International Nuclear Community
- Global Nuclear Safety and Security Regime
- Rising Expectations for Nuclear Development
- Issues and Trends in Nuclear Safety and Security

# International Atomic Energy Agency



IAEA

“Atoms for Peace”

- Nuclear Technology
- Safety and Security
- Safeguards

# Norwegian Nobel Committee Citation

“The... Committee has decided that the Nobel Peace Prize for 2005 is to be shared... between the IAEA and its Director General...



- for their efforts to prevent nuclear energy from being used for military purposes, and
- to ensure that nuclear energy for peaceful purposes is used in the **safest possible way.**”

*“ At a time ...when there is a danger that nuclear arms will spread both to states and to **terrorists groups**, and when nuclear power again appears to be playing an increasingly significant role, IAEA’s work is of incalculable importance.”*



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# Changing World and Challenges to the International Nuclear Community (1)

- Globalization
- Sustainable and dynamic development
- Secure, safe and clean energy supply (Middle East, Russia)
- Climate change
- Nuclear “Renaissance” (Vita Nova)
- Non-proliferation (DPRK, Iran)
- Public concern for nuclear safety, spent fuel, waste
- Security threat (Nuclear Terrorism)
- Technology and management innovation (high performance)



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# Changing World and Challenges to the International Nuclear Community (2)

- Global Consensus and Shared Perceptions emerged from Chernobyl and 9/11 :
  - All in the same boat now
  - Prevent another watershed event at all cost
  - Act together through international cooperation and coordination
  - An accident any where is an accident everywhere

# Global Nuclear Safety Regime

**International Legal Instruments**  
Conventions and Codes of Conduct

**IAEA Safety Standards**

**IAEA Safety Reviews and Services**

**Global Knowledge Network**

**Global Experts' Community**

**National and Regional Nuclear Safety Infrastructure**

**Regulation**

**Research & Education**

**Operation**



# Timeline (1)

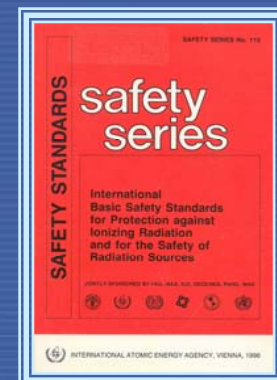
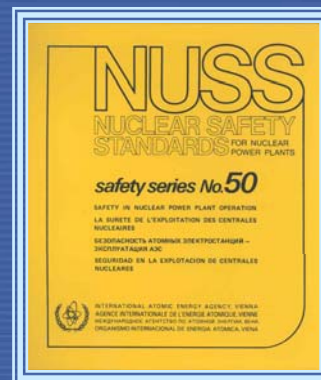
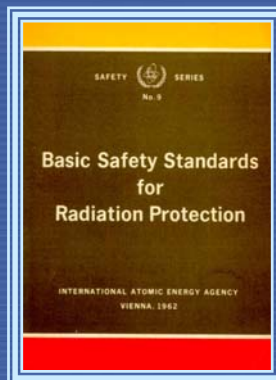
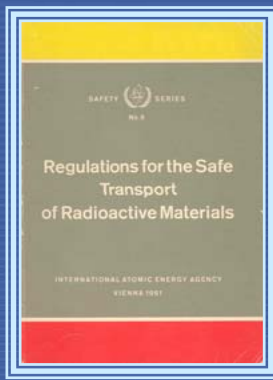
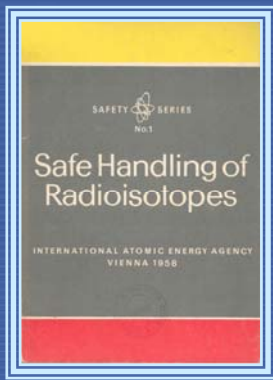
Safe Handling  
of Radioisotopes

Safe Transport  
of Radioactive  
Material

BSS for  
Radiation  
Protection

NUSS  
Programme

Basic Safety  
Standards



1958

1961

1962

1974

1996

# Timeline (2)

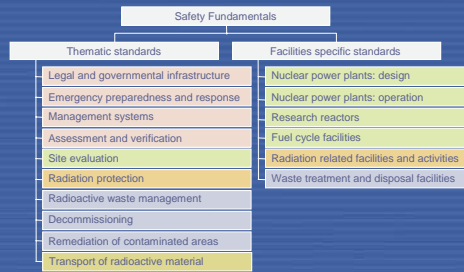
*Commission and Committees*

**CSS  
COMMISSION ON  
SAFETY STANDARDS**



1996

*Overall Structure*



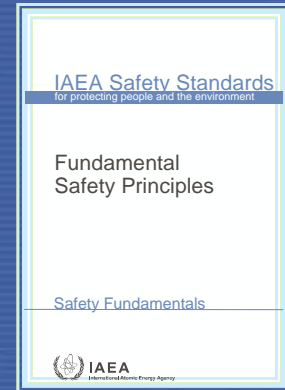
2003

*Action Plan*



2004

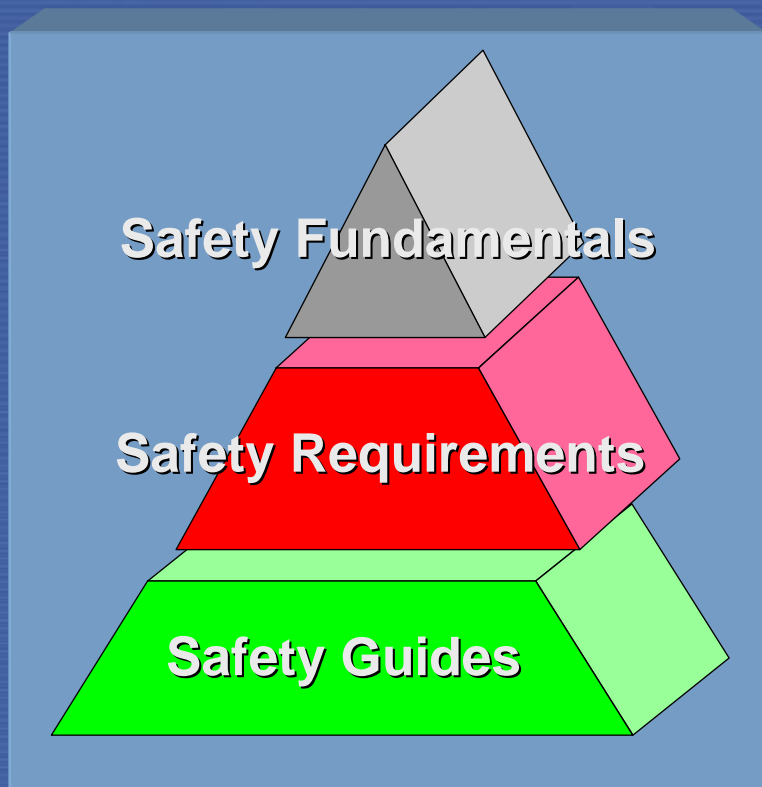
*Unified Safety Fundamentals*



2006

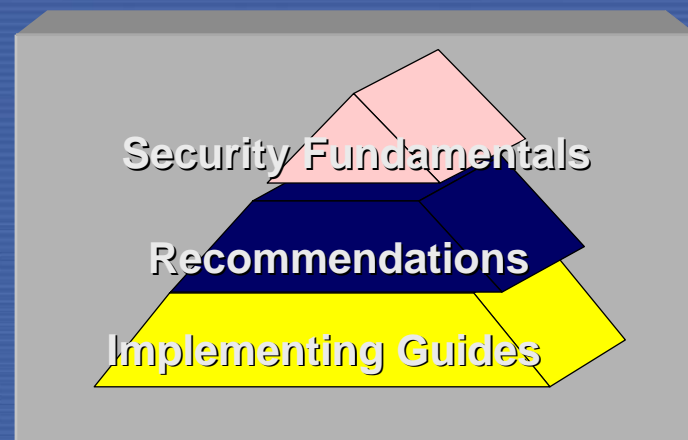
# Structure of Safety and Security Documents

## NUCLEAR SAFETY STANDARDS



**Mature stage through transparent development process**

## NUCLEAR SECURITY SERIES



**Early stage of development**

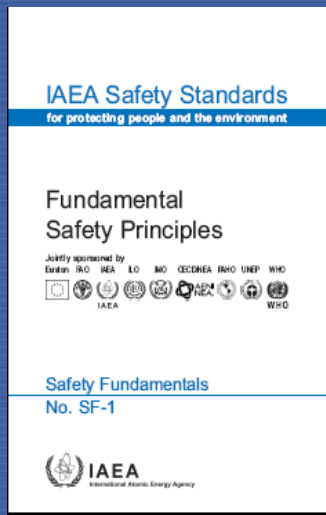
**Global reference for high level of nuclear safety and security**

# Safety Fundamentals

- Global reference point for the high level of safety required for use of nuclear energy
- Ten principles:

1. the prime responsibility for safety must rest with the operator

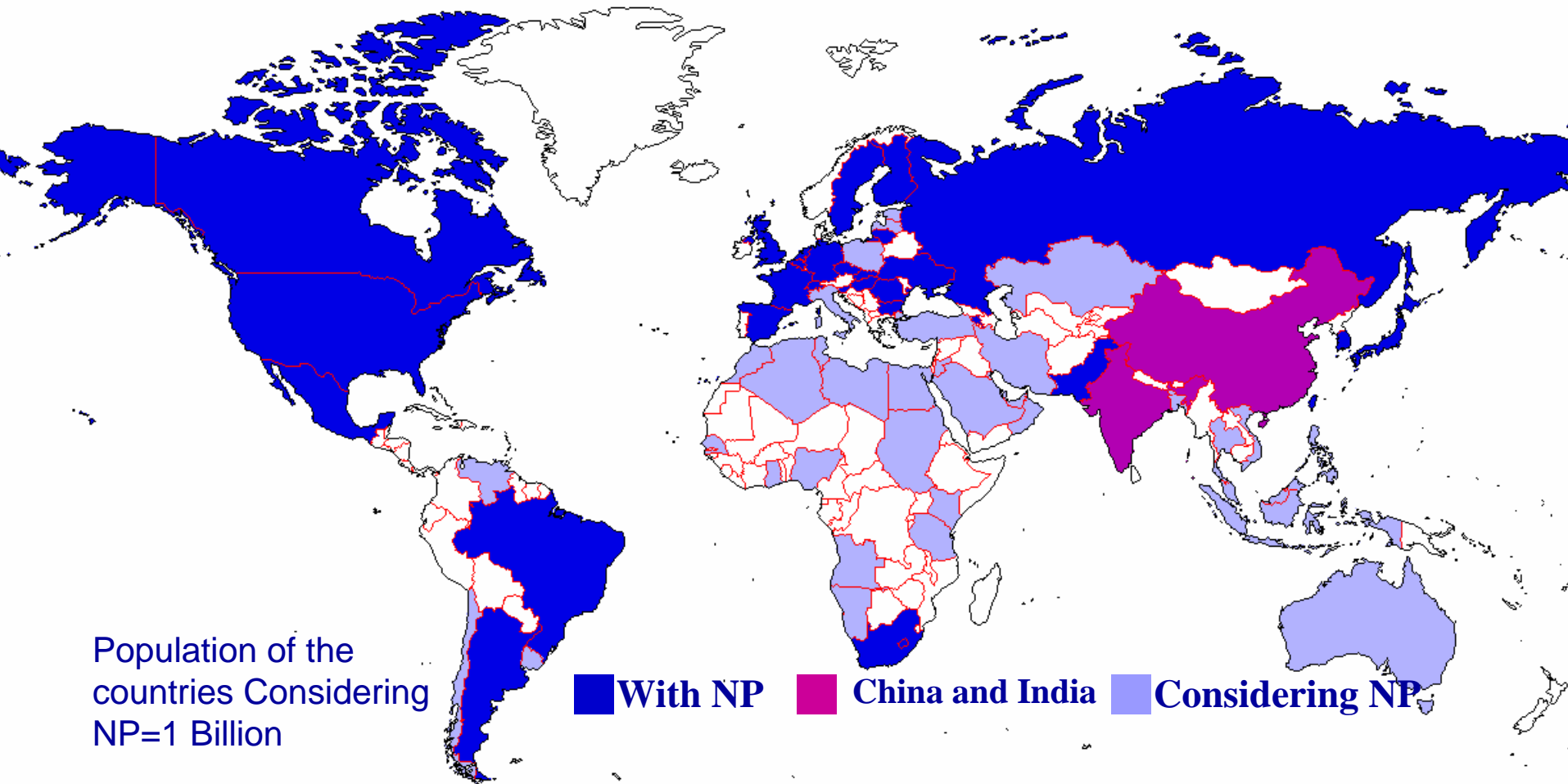
2. an effective legal and governmental framework for safety, and a competent, independent nuclear safety regulatory body with sufficient authority to ensure compliance



.....

.....

# Increasing Nr. of countries considering introduction of nuclear power



Population of the countries Considering NP=1 Billion



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# Challenges

- Safety and Security are national responsibilities but their consequences are increasingly global
- Strong National and Regional Infrastructure for Nuclear Safety and Security
- Continuous improvement of worldwide safety and security of nuclear facilities and other use of radioactive materials
- Enhancement of weak links of the global nuclear safety and security chain which determine the overall strength of the Regime



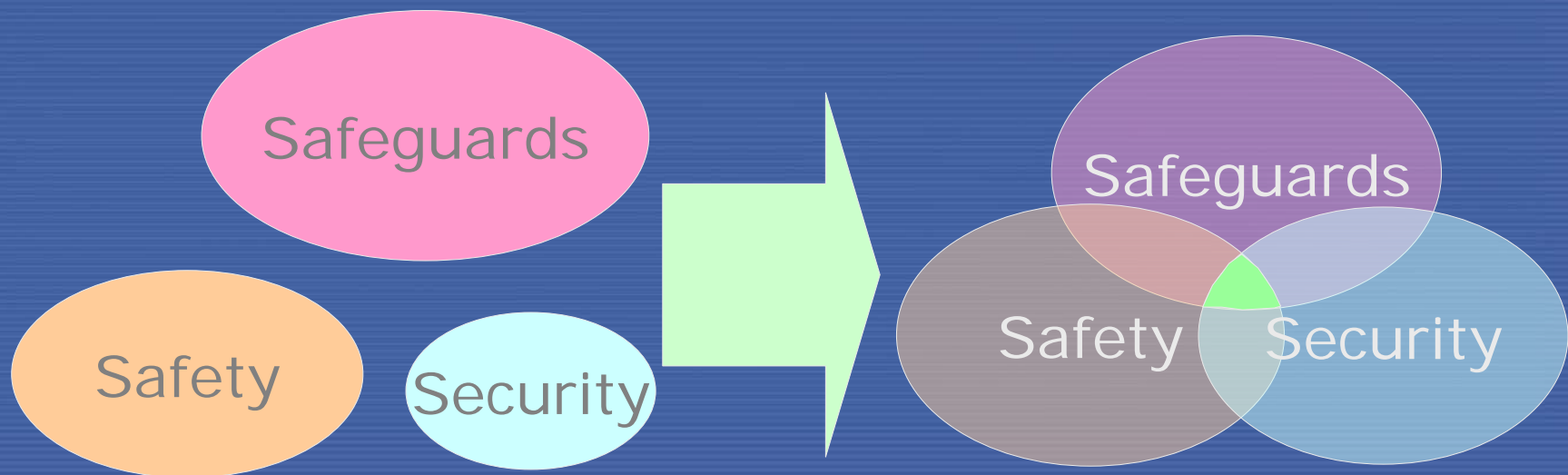
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# Holistic Approach

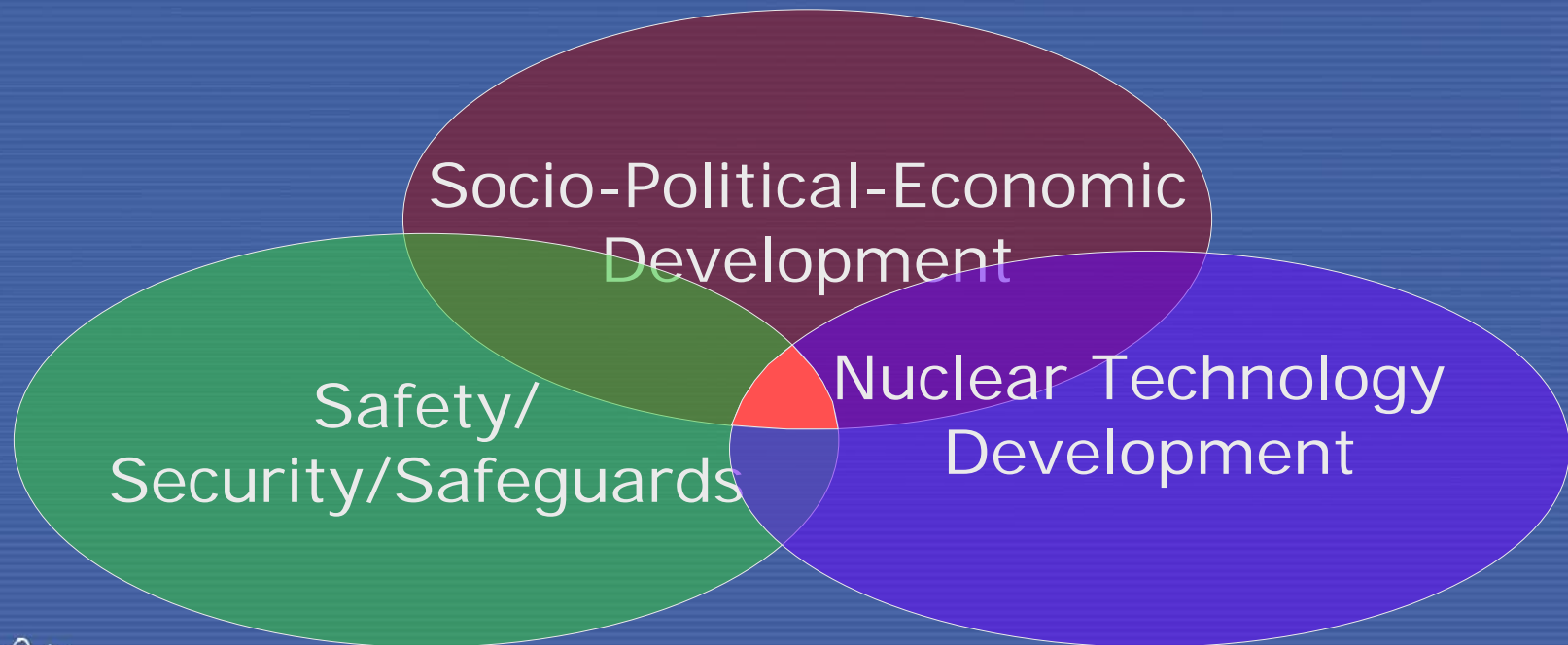
- Nuclear Safeguards – Non-proliferation
- Nuclear Security – Counter Terrorism
- Nuclear Safety – Leadership for Technical Control



Peaceful, safe and secure use of nuclear technology

# Sustainable Development (Big Picture)

- Supply of Resources
- Protection of People and Environment
- Maintenance of Peace



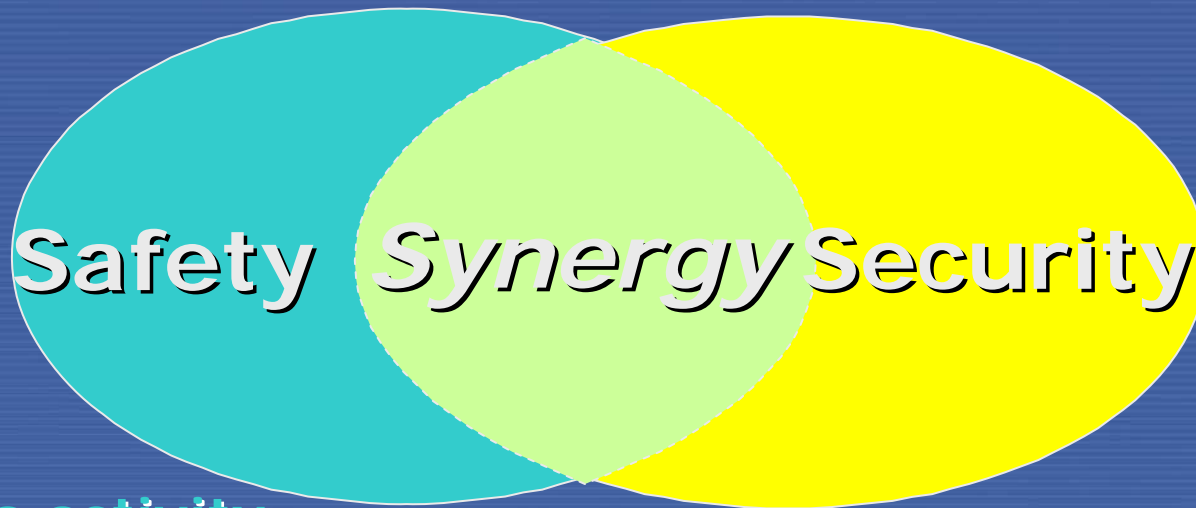
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# Safety and Security Synergy

Safety and Security share a common aim:  
preventing or restricting harm to people and environment



**Intrinsic to activity**

**Man-machine  
systemic failure**

**Transparency**

**Management & Control**

**Regulatory Infrastructure**

**Emergency Preparedness**

**Malicious  
intentions**

**Criminal or  
unauthorized acts**

**Confidentiality**



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# Safety Conventions and Codes

Convention on Early Notification of a Nuclear Accident

Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

Convention on Nuclear Safety

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

Code of Conduct on the Safety and Security of Radioactive Sources

Code of Conduct on the Safety of Research Reactors



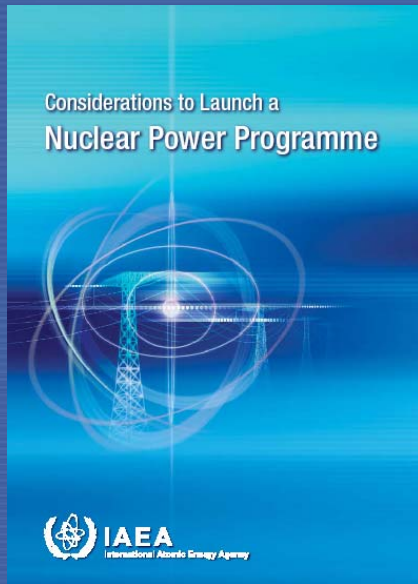
IAEA Safety Standards are increasingly complementing international instruments

# Considerations to launch a nuclear power programme (1)

- Introduction of nuclear power is a major undertaking requiring careful planning, preparation and investment and a sustainable infrastructure that provides legal, regulatory, technological, human and industrial support to ensure that the nuclear material is used exclusively for peaceful purposes and in a safe and secure manner.

# Considerations to launch a nuclear power programme (2)

## Towards the implementation of a NPP



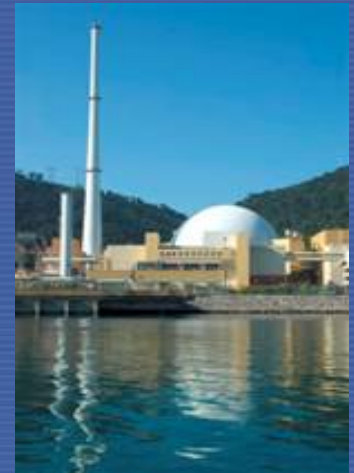
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Unlike many large industrial projects, a nuclear power project involves certain unique characteristics related to, inter alia:

non proliferation,  
nuclear safety and security,  
long term waste  
management,  
public trust.

# Issues and Trends in Nuclear Safety (1)

- Ambitious Nuclear Development Plans and Globalization of the Nuclear Community
- Need for Nuclear Safety Infrastructure and International Cooperation
- Global Nuclear Safety Regime
- Regulatory Effectiveness and Legal Framework



# Issues and Trends in Nuclear Safety (2)

- Leadership, Management for Safety and Safety Culture
- Openness and Transparency
- Operational Safety Performance
- Technical Developments in Safety Analysis

# Issues and Trends in Nuclear Safety (3)

- Long Term Operation
- Sharing Experience and Lessons Learned
- Human and Knowledge Resources
- 
- International Cooperation for Research & Development, Education and Training



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# Security related Conventions & Codes

Convention on the Physical Protection of Nuclear Material (CPPNM)

Convention on the Suppression of Acts of Nuclear Terrorism

Code of Conduct on the Safety and Security of Radioactive Sources

UN Convention and Security Council Resolutions

IAEA Nuclear Security Plan 2002-2005, 2006-2009

IAEA Nuclear Security Series



**IAEA Security Guidance documents under development**

# IAEA Nuclear Security Activities

- ***Establishment of Nuclear Security Series***
  - Fundamentals, Recommendations and Implementing Guides
- ***Advisory and Review Services***
- ***Training Courses and Workshops***
- ***Sharing Experience and Knowledge through Networking (Information Confidentiality)***
- ***Support for Implementation of Conventions and UN Resolutions***

***Assessment, Analysis & Coordination***

***Prevention***

***Detection & Response***

***Experience Feedback***

# Knowledge Management

- 450 million hits in Google search.
- More focus is needed on how to manage knowledge instead of what's KM
- Concrete applications in the nuclear safety field aim at :
  - recognizing valuable knowledge to be captured, analyzed, stored and shared transforming tacit in explicit knowledge
  - mapping processes and associated knowledge domains for continuous improvement
- Essential knowledge to be managed internationally is the common knowledge from operating experience and scientific knowledge
- Industry can recover knowledge much faster as demand requires



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