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Joint ICTP-IAEA School of Nuclear Knowledge Management

1 - 5 September 2008

Knowledge Management: Safety Considerations

P. FIRBAS

IAEA, INIS & Knowledge Management Section, P.O. Box 100 A-1400 Vienna AUSTRIA

Managing Nuclear Safety Knowledge - Safety Considerations

Petr Firbas

IAEA

Department of Nuclear Safety and Security



Presentation Outline

Background

KM at NS/IAEA

KM for Member States



International Atomic Energy Agency

Agency's Three Pillars

- Verification
- Nuclear Technology
- Safety and Security





SAFETY VISION

A strong, sustainable and visible global safety regime

that provides for:

- protection of people and the environment from effects of ionizing radiation
- minimization of the likelihood of accidents or malicious acts that could endanger life and property, and
- effective mitigation of the effects of any such events



Why do we need nuclear KM?

- Nuclear knowledge is a strategic asset, which needs to be preserved, as it is needed for <u>safe</u> use of nuclear science and technology.
- The nuclear workforce is aging, without a corresponding influx of appropriately qualified younger personnel to replace them.
- The Agency established, in 2002, KM as an Agency-wide cross cutting activity. This activity was requested by GC resolutions.









IAEA NS - STRATEGY

- Three challenges:
 - Global use of IAEA Safety Standards
 - Integrating Safety Standards and their application
 - Global networking and outreach





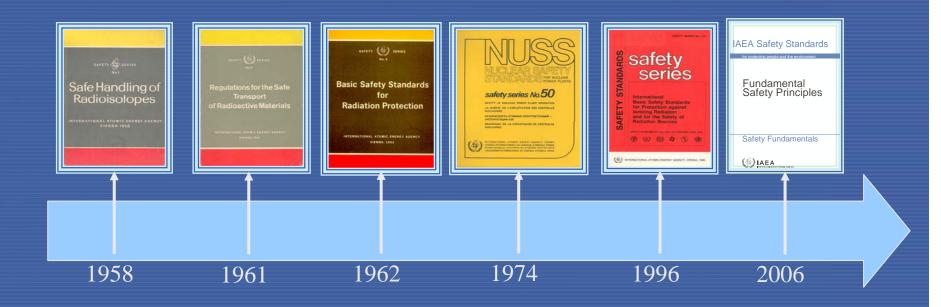




Safety Standards

Fundamental Safety Principles

Board approval of in June 2006





Conference on KM in Nuclear Facilities

- Nuclear knowledge management should become an integral part of all nuclear activities on project, corporate and national levels:
 - As part of all large nuclear projects;
 - As part of the corporate or institutional management system of all organizations involved in research, development and utilization of nuclear energy and radiation technologies;
 - As part of national (governmental) nuclear development plans and policies



Conference on KM in Nuclear Facilities

- Nuclear knowledge management can
 - contribute to maintaining the core knowledge that must be in place to operate existing plants safely;
 - help achieve gains in economic and operational performance;
 - help preserve existing knowledge and channel it towards future innovations;
 - help assure the smooth and effective transfer of the knowledge of today's generation to the next generation.



Department of NS - Background

- Department of Nuclear Safety & Security (NS), has approx. 200 staff
- 3 Divisions & 10 Sections each with related network drives
- Information exchange was mostly been done through one common network drive or by e-mail
- Knowledge was stored in many different locations and databases



Knowledge Portal for NS Staff

Objective:

To provide an integrated solution to capture, preserve, create and share safety knowledge amongst staff in NS



KM Portal Implementation

- Planned step by step process
- Promoted by upper management
- Environment conductive to knowledge sharing
- Incorporated in work routines



Benefits of KM Portal

- Faster decision making and better quality decision.
- Greater opportunities for collaboration and sharing knowledge.
- Better and faster access to expertise, when needed.
- More targeted and effective education and training
- Wider dissemination of nuclear safety knowledge.



Thematic Areas

Road Map:

- Develop the NS Knowledge Map
- Identify data sources and file structures
- Identify relevant documents
- Provide access and training to staff
- Populate the knowledge map of the Portal



Nuclear Installations Thematic Areas

Regulatory Control

NPP Engineering Safety NPP Operational Safety Safety Assessment and Verification Research Reactor Safety

Communication of Safety

National Regulatory Infrastructures

Regulatory Supervision of Research Reactors

Event Reporting and Analysis for Regulators

Design Safety

External/ Internal Events and Siting

Computer Based Systems Important to Safety

Small and Medium Sized Reactors

Safety Aspects of Ageing

Operational Safety
Performance

Operational Safety

Management of Safety and Safety Culture Safety Analysis and Accident Management

Safety Management Tools Safety in Design and Operation

Experience Feedback **INES**

News



Radiation, Waste & Transport Thematic Areas

General Safety

Radiation Safety

Transport Safety

Radioactive Waste Safety

Disposal Waste

Dischargeable Waste

Emergency Planning and Response

Patient Protection

Transport Safety Regulations

Legal and Governmental Infrastructure

Source Safety and Security

Residual Waste

Radiation Protection Fundamentals

Occupational Radiation Protection

Remediation

Personnel Monitoring

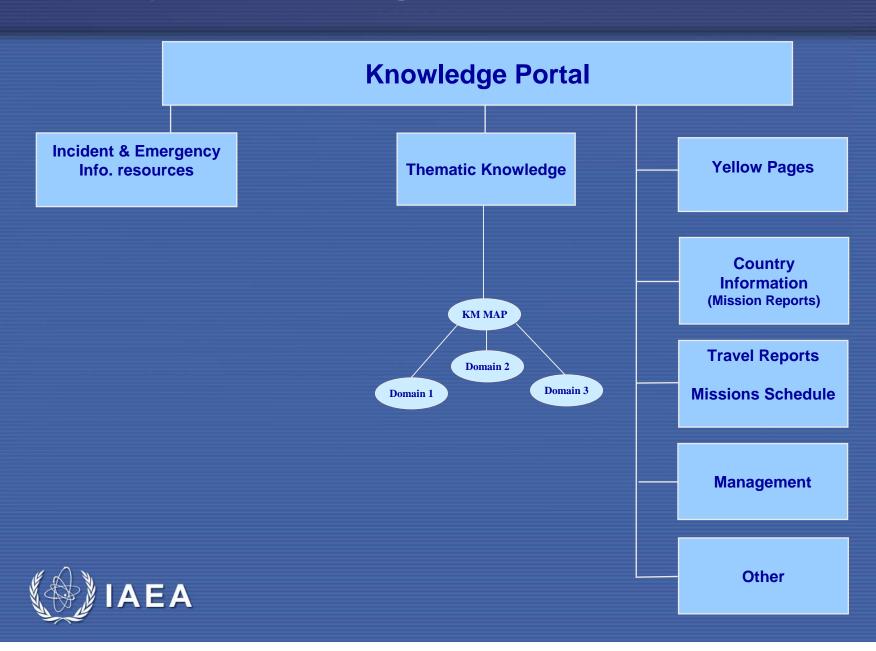
Infrastructure

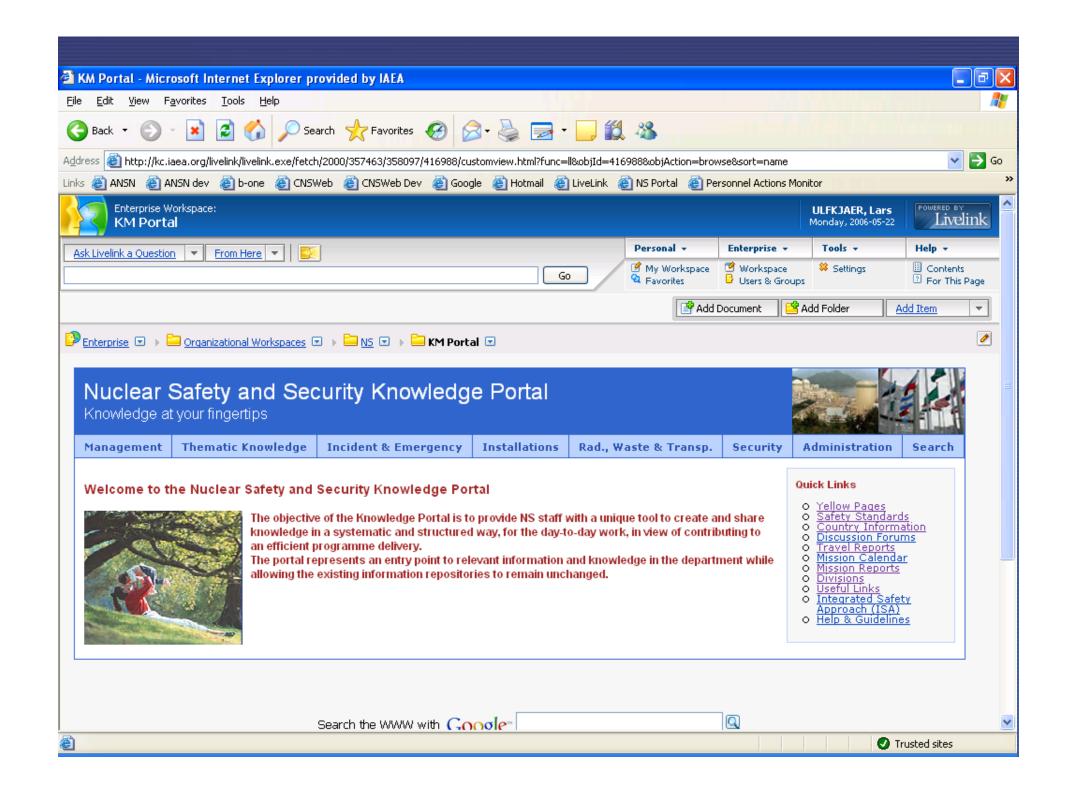
Operational Radiation Protection

Decommissioning



Safety Knowledge Portal







Nuclear Safety and Security Knowledge Portal

Knowledge at your fingertips

Management | Thematic Knowledge

Incident & Emergency

Installations

Rad., Waste&Transp.

&Transp. | Security

Administration

Quick Links

O Home

Sitemap

Management

DDG's Corner

DDG Meetings - approved documents

DDG Prsentations and Speeches

Meetings

Departmental Seminars and Meetings
IAEA Meetings Information
G8 Nuclear Safety and Security Group
General Conference Highlights
Briefing Notes

Strategy

Integrated Safety Approach (ISA)

Evaluation of Major Programme 3: Nuclear Safety and
Security

Other

Staff Survey 2004 - NS Results and Action Plan

Planning

Rolling Weekly Plans Mission Calendar

Knowledge Sharing

Asian Nuclear Safety Network

Ibero american Network

NS knowledge management

DG Briefing Notes

IT Management and Administration in NS

Newsletters

Nuclear Safety Newsletter
ANSN Newsletter



Nuclear Safety and Security Knowledge Portal

Knowledge at your fingertips

Management Thematic Knowledge **Incident & Emergency**

Installations

Rad., Waste & Transp.

Security

Administration

Home

NS Knowledge Portal Sitemap

Home

Management

DDG's Corner

DDG Meetings

DDG Meetings - Approved Documents DDG Presentations and Speeches

Meetings

Departmental Seminars and Meetings

IAEA Meeting Information

G8 Nuclear Safety and Security Group

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Steering Committee

Planning

Rolling Weekly Plans Mission Calendar

Knowledge Sharing

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NS knowledge manag DG Briefing Notes

IT Management and A

Strategy

Integrated Safety App Evaluation of Major Pro

Newsletters

Nuclear Safety Newsle ANSN Newsletter

Quick Links

- Yellow Pages
- Safety Standards
- Country Information
- Discussion Forums
- Travel Reports
- Mission Calendar
- Mission Reports
- Divisions
- Useful Links
- Additional Search
- Integrated Safety
- Approach (ISA)
- Help & Guidelines

Thematic Knoledge

Management Systems

Emergency Preparedness and Response Safety and Security of Radiation Sources

Nuclear Installation Safety

Waste Safety

Transport Safety

Radiation Safety

Legal and Governmental Infrastructure

Incident & Emergency

Nuclear Facilities

Radiation, Transport and Waste

Response Team

Installations

Nuclear Power Plants Research Reactors **Nuclear Fuel Cycle Facilities**

Radiation, Transport and Waste

<u>Security</u>



Incident and emergency information





Wikipedia portal



navigation

- Main Page
- Community portal
- Current events
- Recent changes
- Random page
- Help
- Donations

search

Go Search

toolbox

- What links here
- Related changes
- Upload file
- Special pages
- Printable version
- Permanent link

article discussion

view source history

Main Pag Discussion about the content page [alt-t]

Welcome to the Main Page of the IAEA Nuclear Safety Wikipedia Site!

Scope of the Nuclear Safety and Security Programme:

Establishing IAEA Safety Standards & and related publications &

Providing for the application of standards for the

- Safety of nuclear installations
- Safety of radioactive sources
- Safe transport of radioactive material
- Management of radioactive waste

The security of nuclear installations, nuclear material and radioactive material Knowledge management and networking

Organizational structure of the Department of Nuclear Safety and Security: &

Office of the Deputy Director General @

- Safety and Security Coordination Section
- Incident and Emergency Centre 🗗
- Office of Nuclear Security 4

Division of Nuclear Installation Safety @

- Director's Office 🗗
- Policy and Programme Support Section d
- Engineering Safety Section 🗗
- Operational Safety Section 🗗
- Safety Assessment Section &
- Regulatory Activities Section 🗗
- Research Reactor Safety Section @

Division of Radiation, Transport and Waste Safety @

- Policy and Programme Support Section d
- Radiation and Transport Safety Section 🗗
- Waste Safety Section 🗗

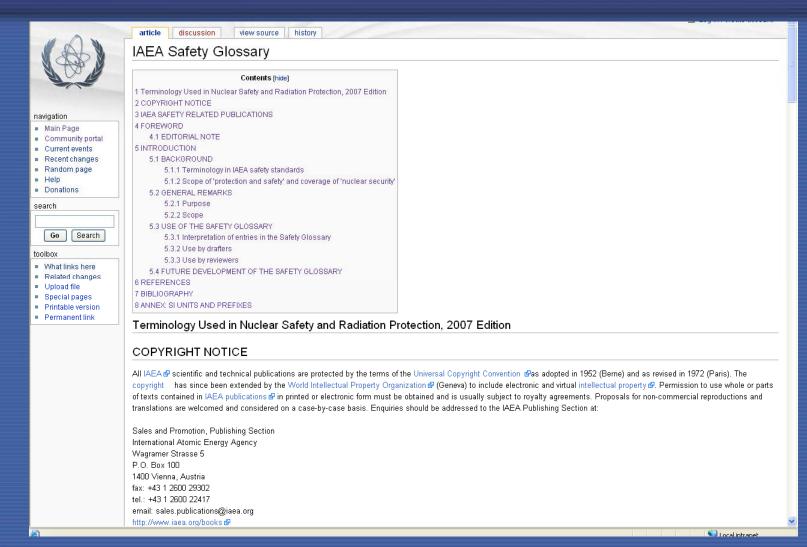


Department of **Nuclear Safety** & Security

*Formulates and implements the Agency's major programme that deals with the protection of people and the environment against radiation exposure, while responding to the safety and security related needs of its Member States"



Wikipedia portal





Other KM activities in NS

- Access to all Mission, travel, and meeting information
- Knowledge Transfer for departing staff and Succession Planning
- Knowledge Base for country information
- IT systems for coordination activities and project management



Other KM activities in NS

- Access to all Mission, travel, and meeting information
- Knowledge Transfer for departing staff and Succession Planning
- Knowledge Base for country information
- IT systems for coordination activities and project management



Nuclear Safety Knowledge Management for Member States



KM for Member States

- Increased interest in KM in Member States
- Common problems, situation and infrastructure
- Assistance and solutions often suitable for several countries in same region
- IAEA experience is being shared with Member States



Global Nuclear Safety Regime

International Legal Instruments

Conventions and Codes of Conduct

IAEA Safety IAEA Safety Standards Reviews and Services Global Knowledge **Network** Global Experts' Community

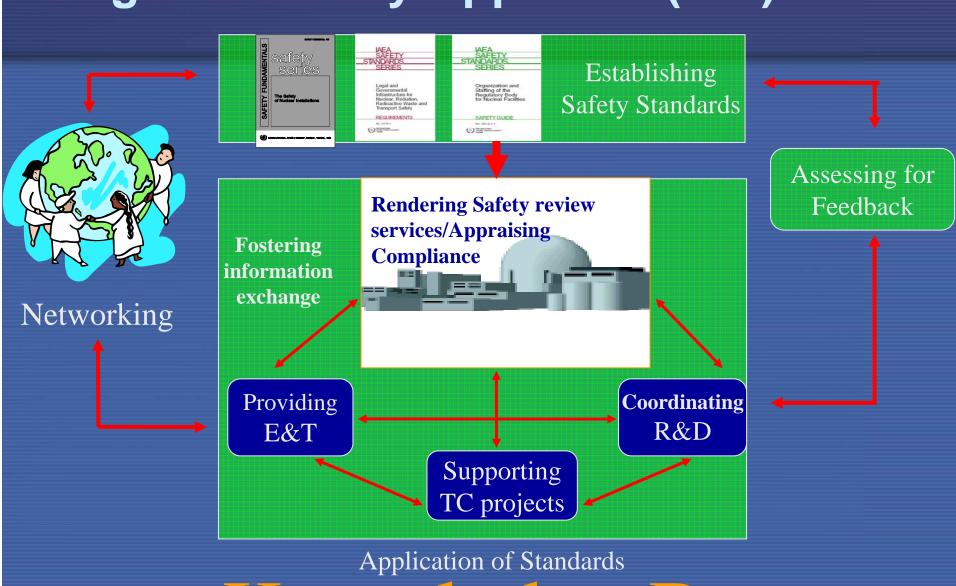
Regulation

National and Regional Nuclear Safety Infrastructure

Research & Education

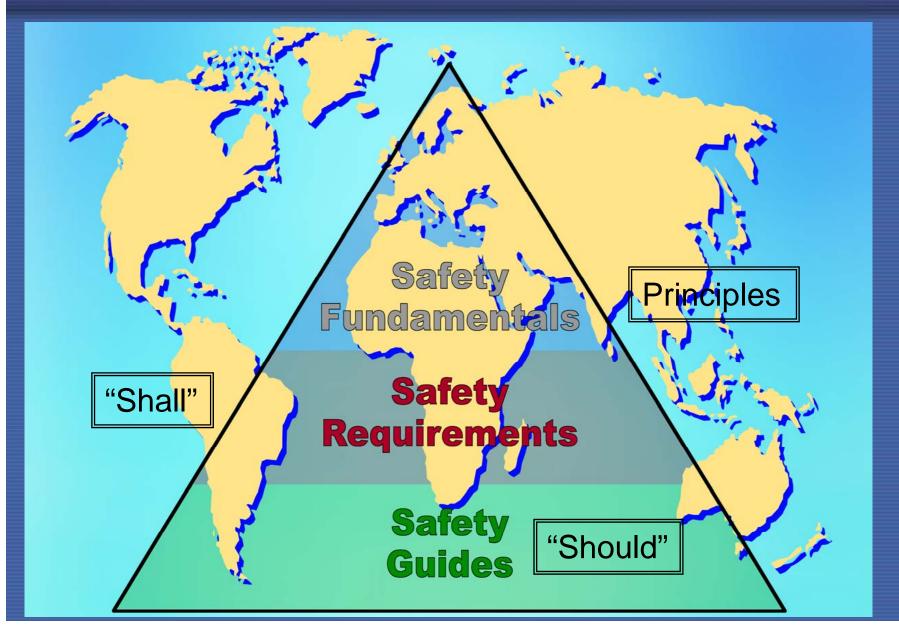
Operation

Integrated Safety Approach (ISA)





IAEA Safety Standards - Hierarchy -



Process Flow for the Development of IAEA Safety Standards



(Subject Related)

Knowledge Domains

(Process Related)









File Edit View Favorites Tools Help

Information Finder

<u>Home</u>

F	eedback by	y Me	mb	er States
	Amontina (1)	1		Auetvalia (

Argentina (1)		Australia (2)		
Brazil (2)		Canada (3)		
China (1)		Czech Rep (0)		
Denmark (0)		Egypt(0)		
France (0)		Germany (2)		
India (1)		Israel (0)		
Japan (3)		Rep. of Korea (2)		
Pakistan (4)		Russia (2)		
South Africa (0)		Spain (0)		
Sweden (1)		Switzerland (3)		
UK (1)		USA (2)		
EC(0)		ICRP(0)		
OECD/NEA(1)				

Overview of IAEA Safety Standards application

Thematic subjects

Legal & governmental infrastructure

Emergency preparedness & response

Management systems

Assessment & verification

Site evaluation

Radiation protection

Radioactive waste treatment

Decommissioning

Rehabilitation of contaminated areas

Transport of radioactive material

Facility and activity specific subjects

Nuclear power plants: design

Nuclear power plants: operation

Research reactors

Fuel cycle facilities

Radiation related facilities & activities

Waste treatment & disposal facilities

Problems in applying IAEA Safety Standards

Feedback on Safety Standards

Objective

This system accumulates feedback information and displays it in a manner that facilitates information retrieval in connection with IAEA Safety Standards.

Information Source

Included is feedback information from reports presented at CSS-16, CSS-17 and CSS-18 meetings.

Information Structure

Feedback information is retrieved by clicking country name or thematic subject defined in the left frame.

Safety Standards

The current status of IAEA Safety Standards is displayed by clicking thematic subject or facility and activity specific subject in the table on the right.

Status of Safety Standards

Safety Fundamentals

Thematic

Legal and governmental infrastructure

Emergency preparedness and response

Management systems

Assessment & verification

Site evaluation

Radiation protection

Radioactive waste treatment

Decommissioning

Rehabilitation of contaminated areas

Transport of radioactive material

Facility & Activity Specific

Nuclear power plants design

Nuclear power plants operation

Research reactors

Fuel cycle facilities

Radiation related facilities & activities

Waste treatment and disposal facilities

For further information, please contact Luis Lederman, L.Lederman@iaea.org, Safety and Security Coordination Section Department of Safety and Security, IAEA, Wagramer Strasse 5, P.O.Box 100, A-1400 Vienna, Austria.

Rev. 6 June 2006





























Standards

Problems in applying IAEA Safety





Limiting Exposure to Ionising Radiation

Recommendations for Limiting Exposure to

Ionising Radiation and National Standard for





BSS 115 was published largely based on 60.



Basic radiation protection guidance-but prepared before IAEA







Information Finder

Home

		-
Feedback b	y Member	States

File Edit View Favorites Tools Help

•	ceases, lemser states					
	Argentina (1)		Australia (2)			
	Brazil (2)		Canada (3)			
	China (1)		Czech Rep (0)			
	Denmark (0)		Egypt(0)			
	France (0)		Germany (2)			
	India (1)		Israel (0)			
	Japan (3)		Rep. of Korea (2)			
	Pakistan (4)		Russia (2)			
	South Africa (0)		Spain (0)			
	Sweden (1)		Switzerland (3)			
	UK (1)		USA (2)			
	EC(0)		ICRP(0)			
	OECD/NEA (1)					

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Research reactors

Fuel cycle facilities

Radiation related facilities & activities

Waste treatment & disposal facilities

Problems in applying IAEA Safety Standards

Problems in Applying IAEA Safety Standards: Difficulties & Requests

(CSS-17 Germany)

German Feedback to IAEA

An additional benefit of the comparison of the German nuclear rules and regulations with the selected IAEA NUSSC standards are several recommendations for an improvement of the appropriate IAEA rules. These recommendations will be forwarded to the IAEA at a given time.

(CSS-16 Japan)

Comparison of the IAEA design requirement (INS-R-1) and the current Technical Standards for NPP's

Equipment is now under way in a process of revising the Japanese standard.

Sometimes it is found difficult to adopt IAEA standards directly into Japanese regulation.

A typical example is treatment of severe accidents. Some IAEA standards (e.g. DS313) seem to be based on the concept that some specific severe accident scenarios should be adopted as design basis accidents, while there is no international consensus on this matter yet. In Japan, the risk due to severe accidents was already lowered by providing accident management measures at all the nuclear power plants. Although the matter is now being discussed in a process to revise Ordinance of Establishing Technical Standards for NPP's Equipment, no conclusions have been obtained yet.

(CSS-17 Japan)

Examples of difficulties in utilizing IAEA Safety Standards

Sometimes it is found difficult to adopt IAEA standards directly into Japanese regulation as follows;

One of the examples is treatment of severe accidents. Some IAEA standards (e.g. DS313) seem to be based on the concept that some specific severe accident scenarios should be adopted as design basis accidents, while there is no international consensus on this matter yet. In Japan, the risk due to severe accidents was already lowered by providing accident management measures at all the nuclear power plants. Although the matter is now being discussed in a process to revise Ordinance of Establishing Technical Standards for NPP's Equipment, no conclusions have been obtained vet.

Another example is the consideration for decommissioning in the design of NPPs to minimize radioactive waste, to assure access capabilities and storage of radioactive wastes. The criteria for the requirements are not clear, at this stage, while decommissioning experience is quite limited. Therefore, the requirements are not to be included in the regulations at this stage.

(CSS-18 Japan)

Example of difficulties in utilizing IAEA Safety Standards: Sometimes it is found difficult to adopt IAEA standards directly into Japanese regulation. A typical example is treatment of severe accidents. Some IAEA standards (e.g. DS313) seem to be based on the concept that some specific severe accident scenarios should be adopted as design basis accidents, while there is no international consensus on this matter yet. In Japan, the risk due to severe accidents trong already largered by praviding accident management managers at all the midder narror plants. Although the matter













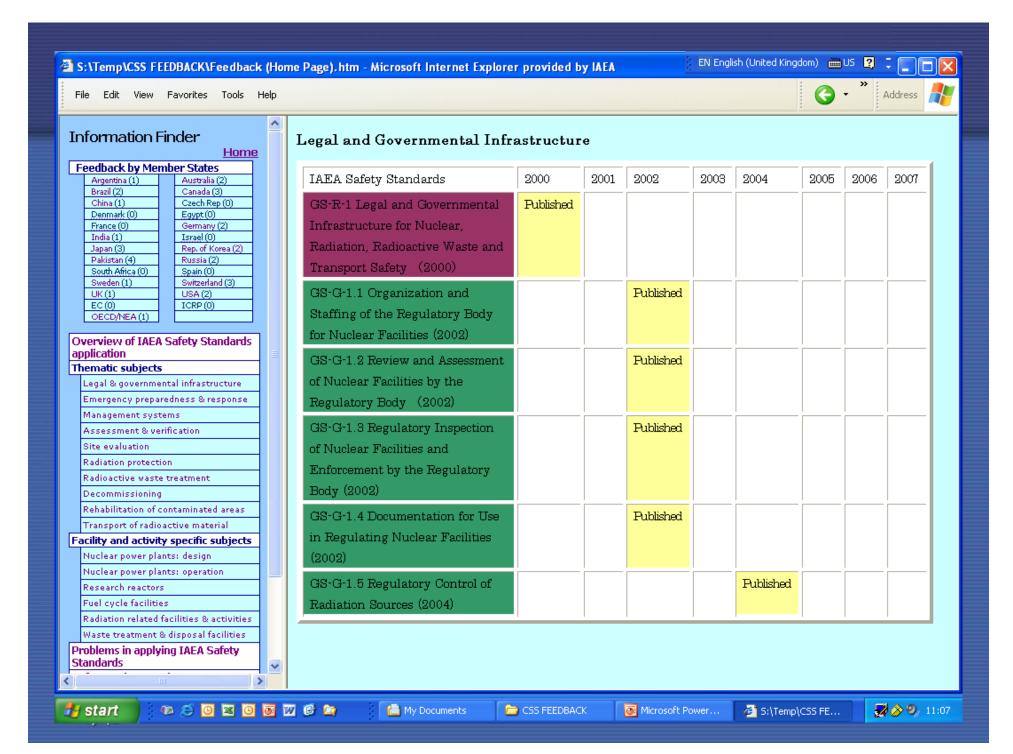




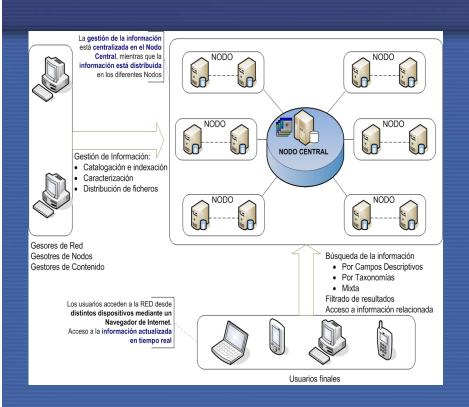




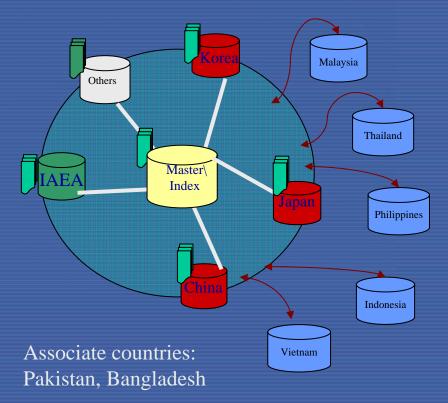




Safety Networks



Asian Nuclear Safety Network Iberoamerican Radiation Safety Network





Global Knowledge Network

- Asian Extrabudgetary Programme: Outline -

Extrabudgetary Programme (EBP) on the Safety of Nuclear Installations in South East Asia, Pacific and Far East Countries

- established in 1997
- to strengthen nuclear safety in NPPs and RRs
- to enhance the technical capabilities of regulatory authorities and technical support organizations
- regional and national programmes for 6 member countries:
 China, Indonesia, Malaysia, Philippines, Thailand and Vietnam
- contributions from Australia, China, France, Germany, Japan,
 Korea, Spain and USA by cash and/or in-kind



Global Knowledge Network - ANSN: Objectives -

- A regional network to facilitate <u>pooling</u>, <u>analysing</u> and <u>sharing</u> existing and new technical <u>knowledge and</u> <u>practical experience</u> to further improve the safety of nuclear installations in the South East Asia, Pacific and Far East Countries.
- Focus of the ANSN is on knowledge related to <u>strengthening regulatory infrastructures</u> and the <u>safety</u> <u>of nuclear power plants and research reactors</u>.



Global Knowledge Network - Asian EBP: Scope -

- Education and training on nuclear safety
- Strengthening national regulatory frameworks, technical and management capabilities including: nuclear legislation, regulations, safety assessment, licensing, inspection and enforcement
- Emergency planning and preparedness
- Promotion of safety culture concepts
- Development of an Integrated Safety Evaluation (ISE)
 process to assess a country's safety regime against
 IAEA nuclear safety standards
- Operation of the Asian Nuclear Safety Network (ANSN)

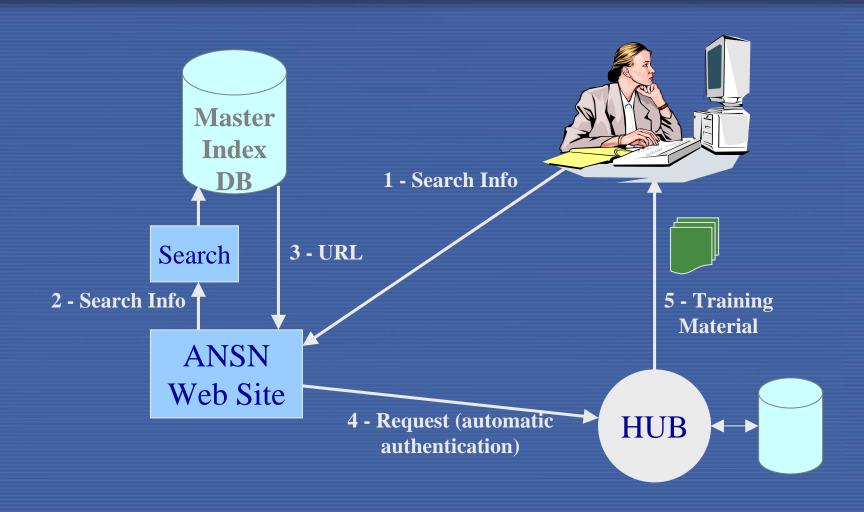


Topical Groups

- Education and Training
- Operational Safety
- Emergency Preparedness and Response
- Radioactive Waste Management
- Safety Analysis
- Safety management of RRs



Concept (Information Search and Retrieval)







Asian Nuclear Safety Network

A regional nuclear safety network to improve safety of Nuclear Installations in the South East Asia, Pacific and Far East Countries.

🔽 🔁 Go 🛮 Links 🍖 🕶

What is ANSN

Knowledge Base

Participants Networking

News

Home: Request New Account: Contact Us

Asian Nuclear Safety Network
Pooling, Analysing and
Sharing Nuclear Safety Knowledge



ANSN Gateway

About ANSN

Asian Nuclear Safety Network



The objective of the ANSN project is to pool and share existing and new technical knowledge and practical experience to further improve the safety of nuclear installations in Asia.

The ANSN computer network is operated in a coordinated yet decentralised manner with 8 ANSN National Centres in China, Indonesia, Japan, Korea, Malaysia, the Phillippines, Thailand and Vietnam. The web site associated to each National Centre provides access to important nuclear safety knowledge and serves as a portal to other ANSN sites. Searching the ANSN is done either locally or through the IAEA web site.

☑ Request new Account

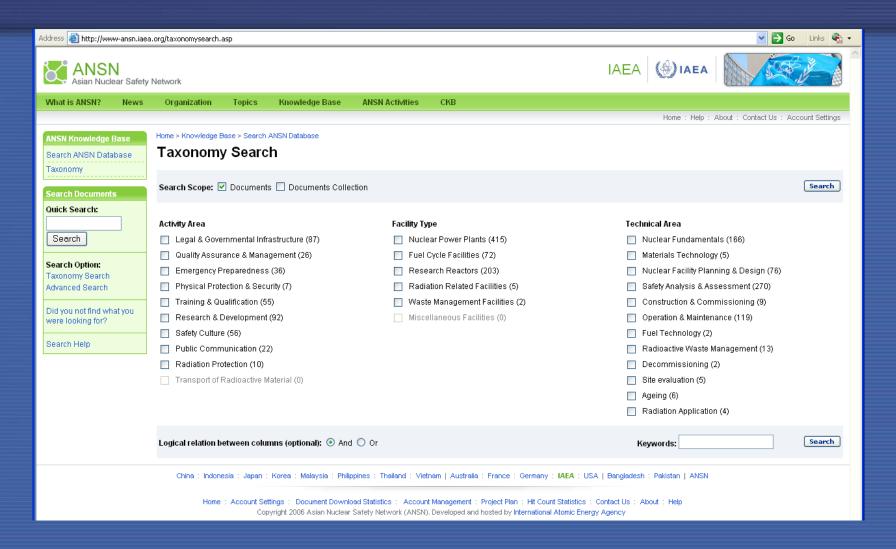


China: Indonesia: Japan: Korea: Malaysia: Philippines: Thailand: Vietnam | Australia: France: Germany: IAEA: USA | Bangladesh: Pakistan: AIISII

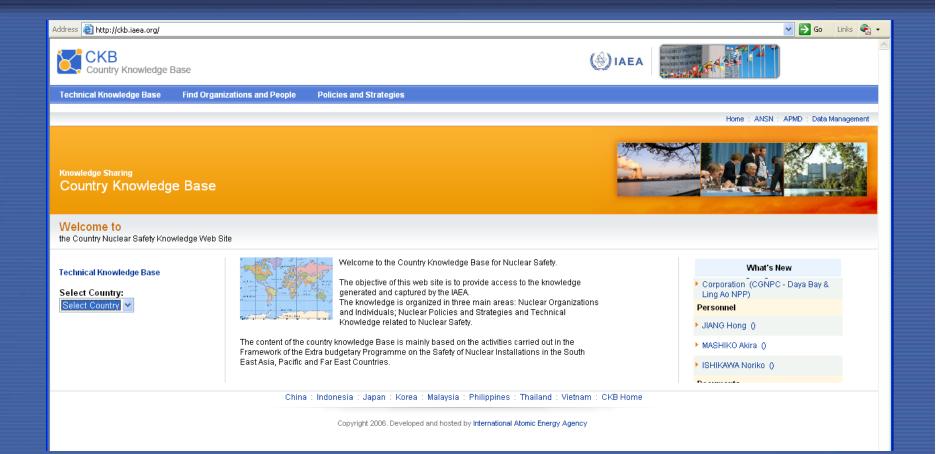
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Knowledge Sharing

China Nuclear Safety Knowledge Base



CKB Home: ANSN: APMD: Data Managament

🗸 🔁 Go Links 🍖 🕶

Welcome to

the web site for Nuclear Safety Knowledge in China

Technical Knowledge Base

Find Organizations and People

Policies and Strategies



Welcome to knowledge Base for China Nuclear Safety.

The objective of this web site is to provide access to the knowledge generated and captured by the IAEA.

The knowledge is organized in three main areas; Nuclear Organizations and Individuals; Nuclear Policies and Strategies and Technical Knowledge related to Nuclear Safety.

The content of China Knowledge Base is mainly based on the activities carried out in the Framework of the Extra budgetary Programme on the Safety of Nuclear Installations in the South East Asia, Pacific and Far East Countries.

What's New (China)

- ▶ Jing Chunning (BINE)
- ► Long Maoxiong (CAEA)

Documents

- (Regional) Regional workshop on Nuclear safety Phase I
- (Regional) CS on safety analysis
- methodology and computer code

China: Indonesia: Japan: Korea: Malaysia: Philippines: Thailand: Vietnam: CKB Home

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Newsletter 1 March 2006



A bi-weekly publication informative of current safety activities and developments taking place in the countries participating in the Extrabudgetary Programme (EBP) on the Safety of Nuclear Installations in South-East Asia, Pacific and Far East Countries.

Celebrating the one year anniversary of the ANSN Newsletter

A message from Mr. T. Taniguchi, IAEA Deputy Director General for Nuclear Safety & Security



I am pleased to hail the one year anniversary of the ANSN Newsletter. The first issue was published in March 2005 and since then the ANSN has continuously im-

proved its content and attracted an increasing number of users.

While we are pleased with the progress to date, we also recognize the need to pursue



Newsletter 1 July 2007



A bi-weekly publication informative of current safety activities and developments taking place in the countries participating in the Extrabudgetary Programme (EBP) on the Safety of Nuclear Installations in South-East Asia, Pacific and Far East Countries

Regional Meeting on the Application of the Code of Conduct on the Safety of Research Reactors for Asian Countries

Argonne, 30 April – 11 May 2007

The purpose of the meeting was to explain the background, content and legal status of the Code of Conduct and to provide the Agency's views on the benefits from applying the Code, to senior experts from Asian countries operating or planning to construct research reactors. The meeting, hosted by Argonne National Laboratory (ANL), was attended by 12 participants

preparedness, extended shutdown and decommissioning of research reactors.

The meeting provided an excellent forum for discussion and exchange of information relative to application of the Code as well as for identification of the common safety issues and opportunities for regional cooperation, which will help in improving the safety of research reactors in the region.

Training Course on Safety
Assessment and Verification for
Nuclear Reactors
Daejon, 14–18 May



Managing Safety Knowledge

- The results of the (200+) TC and EBP missions and workshops are currently stored in the Asian Programme Management Database (APMD)
- This content needs to be analyzed to extract knowledge and share in ANSN



Agency Portal - NUCLEUS



Welcome to Nucleus

Nucleus is the common access point to the IAEA's scientific, technical and regulatory information resources. It incorporates, and facilitates access to more than 130 IAEA databases, scientific and technical publications, as well as safety standards.



What's New?

Food Irradiation Clearances Database



This resource has had a make-over and in the process has been integrated more tightly into Nucleus. It is a database on country approvals of irradiated foods for human consumption. The information includes country name, class of food, specific food product, objective of irradiation, date of approval and recommeded dose limit. It is maintained by the Food and Environmental Subprogramme of the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture. More >

International Nuclear Information System (INIS)



Leading worldwide information source of scientific literature on the peaceful applications of nuclear science and technology, dating back to 1970. Over 2.8 million scientific and technical bibliographic references have been indexed & abstracted in English according to agreed rules and standards. More >>

Services

IAEA Library Catalogue

The IAEA Library Catalogue provides bibliographic information on the location and availability of the Library's collection of books, journals, films and videos, selected technical reports and documents, as well as electronic resources. The catalogue contains more than 90,250 records.

More »

Publications

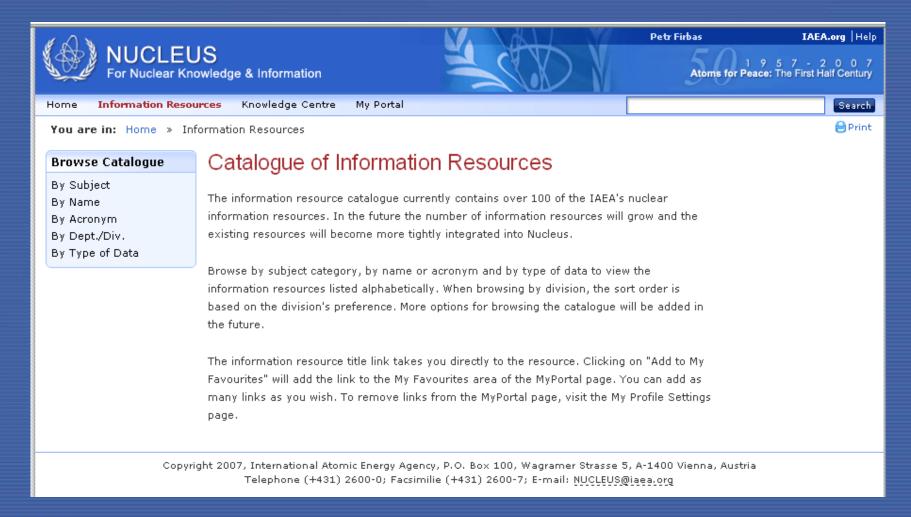
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More >

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Agency Portal - NUCLEUS





Future Challenges

- Application of KM tools to business cases
- Sustainable operations of National Centres for knowledge creation and sharing
- Increase national outreach of networking activities



A way forward

- Knowledge management:
 - Focus on core business processes
 - Collect and organize essential knowledge
 - Select KM tools
 - Develop pilot projects
 - Share experience for mutual learning
- Networking:
 - Complete IT tasks
 - Identify users needs
 - Monitor use and quality
 - Feedback experience



Thank you.

