

Global, Regional or Thematic Networks for Regulators

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Abstract. The Moscow Conference in 2006 highlighted the importance of information networks and databases for nuclear safety and security regulatory activities and recommended broader use and sharing of nuclear safety information and knowledge. Today the World Wide Web contains enormous amounts of valuable safety and security information. In this paper that part of the worldwide web that contains nuclear safety and security information is called the “Global Nuclear Safety and Security Network” (GNSSN).

While this network supports many nuclear regulatory activities quite well the effectiveness can further be enhanced. To this end the IAEA and its Member States supported by the G8 Nuclear Safety and Security Group are now launching an web-based Portal, called RegNet(-Portal) that will offer regulators a more effective direct access to authorized nuclear safety and security information. The RegNet-Portal builds on existing regional networks such as the Asian Nuclear Safety Network, on thematic networks such as the CNS website or the Incident Reporting System (IRS) as well as on information available at sources of international organizations/bodies and their member states. The structure for RegNet has been deduced from today’s system of resources and instruments that are used in international regulatory cooperation to achieve high levels of safety and security worldwide, i.e. from the “Global Nuclear Safety and Security Regime” (GNSSR). The concept of the RegNet-Portal is to establish and maintain common interfaces for direct access to respective information of Member Countries or International Organizations through (hyper-) links to their websites. The responsibility for the content of these websites remains completely with the owners.

The RegNet-Portal will now become operational. It will include systematic access to existing regional and thematic networks. Special attention will be given to information sharing on IRRS missions, generic safety issues and country nuclear regulatory profiles.

Participation in RegNet will contribute to both: enhanced sharing of safety and security information as well as to harmonizing safety approaches.

1. Introduction

The First IAEA International Conference on "Effective Nuclear Regulatory Systems" was held in Moscow, February/March 2006. The objective of the conference was to give senior regulators the opportunity to discuss ways of improving the effectiveness of nuclear safety, radiation safety and security regulation as a whole for the benefit of the global community.

Summary and conclusions of the Conference have been published by the Conference’s President, Lawrence Williams. One of these conclusions is related to global, regional and thematic networking of regulators:

„The Conference recognized the establishment and broader use of information networks and databases to enable regulatory bodies to have prompt access to the most current developments in areas of interest“.

The Conference noted the increasing development of information and knowledge management networks to enhance the regulation of nuclear safety and security.” [1]

That part of the worldwide web, that contains nuclear safety and security information, today is called the “Global Nuclear Safety and Security Network” (GNSSN). This GNSSN contains enormous amounts of valuable safety and security information, often distributed over many sites that are organized in different ways. Identification and use of this information especially with regard to assuring quality and validity requires major efforts. On the other hand establishing and maintaining all individual websites is also a major burden. This leads to the question of what can be done further to support nuclear regulators by enabling more effective and efficient use of the GNSSN in performing regulatory functions.

The approach presented and launched today is a Portal of a Multinational Network among Regulators (RegNet-Portal) which is hosted by the IAEA. Structure and content of the portal shall further be developed at the IAEA together with Member States and other international organizations. The added value of the Portal is the common framework for an easier and effective access and use of safety and security related information and knowledge, enhanced transparency and promotion of harmonization

The RegNet-Portal must not duplicate information. As much use as possible shall be made of already existing open and secured websites of Member States and Organizations involved in nuclear safety and security regulation.

Lead roles in developing the RegNet-Portal for enhanced use of the “Global Nuclear Safety and Security Network” (GNSSN) were played in particular by G8 Nuclear Safety and Security Group (NSSG) and the IAEA:

The Heiligendamm G8 Summit Report (June 2007) stated, that the NSSG would “support the further enhancement of the evolving web-based systems and networks for information exchange and co-operation in nuclear safety matters, as implementation of nuclear conventions, co-operation on safety standards, and harmonization of safety approaches, exchange of operational experience and resolution of generic nuclear safety issues.” [2]

The IAEA hosted a Consultancy Meeting in August 2007 in Vienna, to review the current status and trends of nuclear safety networks, and to identify opportunities for better using the synergies among the networks to continuously enhance nuclear safety. For this meeting, a list of safety networks and information resources was compiled by IAEA and amended by Member Countries [3].

Specific issues of global regulatory networking were addressed in technical meetings such as the Technical Meeting on Global Cooperation on Generic Safety Issues for Nuclear Power Plants and Measures for their Resolution, which was held in Bonn in December 2007. The meeting reached a common understanding of a GNSSN-Portal for:

- co-operation and sharing of information on current safety issues;
- addressing significant findings from operational experience feedback, safety investigations, and research; and
- maintaining and improving knowledge on safety and security matters.

It is concluded that the existing GNSSN essentially has the main elements in place today. But its efficiency and effectiveness for international co-operation on assuring and improving safety and security could be enhanced by pursuing some concerted efforts, related to its contents and to their processing and integration, and to the adaptation of such systems to the changing requirements of the international user community.

Progress has been achieved: The hosted at the IAEA Portal of RegNet as a key part of the Global Nuclear Safety and Security Network for nuclear safety and security regulators has been established by cooperation of Member States and the IAEA staff with continuous support by other international organizations and multilateral cooperation such as by the G8 NSSG. It will be operational in a test mode early next year.

The RegNet-Portal:

- is based on the concept of the Global Nuclear Safety and Security Regime
- uses guidance and recommendations of INSAG 21: “Strengthening the global nuclear safety regime” [4]
- is established by advanced IT collaboration and content management software for global sharing of information and knowledge from existing nuclear safety and security networks
- is flexible to be further extended and adapted to future needs

The GNSSN- and RegNet-Portals offer a new dimension for international regulatory cooperation and for strengthening the effectiveness of the Global Nuclear Safety and Security Regime.

2. Objective of the paper

RegNet-Portal operation will be launched by the IAEA early next year. In this context this paper has the following objectives:

- to present the concept of the RegNet-Portal,
- to refer to existing regional and thematic networks,
- to demonstrate the advantages and potential of RegNet,
- to explain the multilevel concept for the RegNet-Portal and
- to invite national nuclear safety regulators worldwide to actively participate in RegNet and to support its further development.

3. Concept and framework for Networking in a Global Context

3.1 Global Nuclear Safety and Security Regime (GNSSR)

The Global Nuclear Safety and Security Regime (GNSSR) (Fig. 1) is understood here as the institutional, legal and technical framework for ensuring safety and security of nuclear facilities and activities throughout the world. The GNSSR – as other international regimes – is based on a wide range of national and international actors to achieve shared goals while preserving and complimenting the sovereignty, authority and ultimate responsibilities of States. Within each State the primary responsibility for nuclear and radiation safety and security rests with the operator, the industry or the users of nuclear and radiation technologies. The relevant actors also include non-governmental and intergovernmental organizations, experts' communities and civil society. The shared objective of the GNSSR is to lead to a world where the operation of nuclear facilities and the performance of nuclear and radiation activities is safe and secure.

The GNSSR is based on four principal elements:

1. the need to ensure strong national infrastructures and a global experts' community.
2. the widespread subscription to legally binding and non-binding international instruments such as the conventions and the codes of conduct;
3. a comprehensive suite of nuclear safety standards and security guidances that embodies good practices as a reference point to the high level of safety and security required for all nuclear activities;
4. a suite of international safety reviews and services, based on the safety standards as well as international security missions based on security guidances.

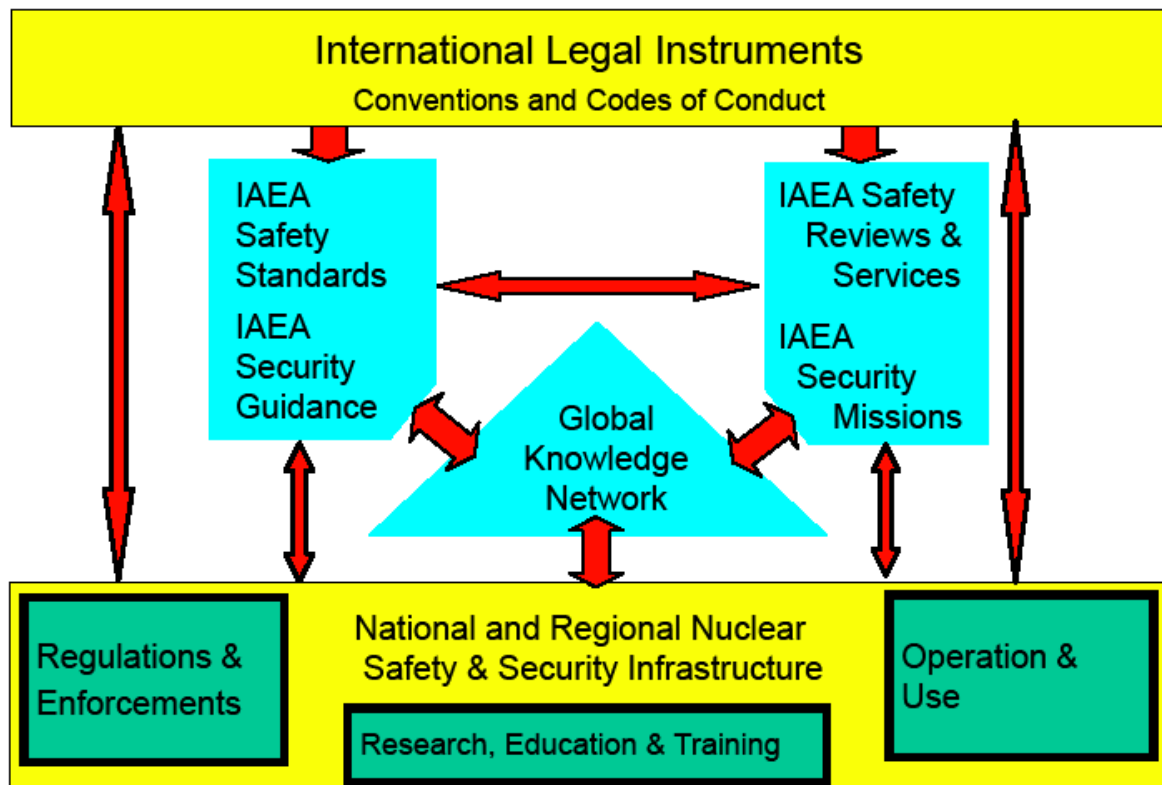


Fig. 1. The Global Nuclear Safety and Security Regime (GNSSR)

At the foundation of this global regime are the strong national infrastructures. The key factors for the effectiveness of the global regime that now are in place since the mid-1990s are the international legal instruments, such as *Conventions* and *Codes of Conduct*. These elements work together in synergy with international safety standards, security guidance, peer reviews and appraisal as well as knowledge networks to support and further strengthen existing national and regional infrastructures.

Any country that wants to start a nuclear power plant programme needs to commit itself to become an active participant in the global nuclear safety and security regime.

The effectiveness of the GNSSR depends on its overall framework of principles, norms, rules and decision-making procedures as well as related institutional, legal and technical resources. The GNSSR becomes effective through its actors and their interactions. Most of the participating actors are operating sites in the World Wide Web. In addition more and more GNSSR activities and interactions are making use of the Internet.

Regimes must be learning systems to be effective. This Conference is a very important contributor to further enhance the GNSSR. Many elements of the GNSSR have been developed and implemented in the past as strategic responses to arising safety and security challenges. Two examples for many others are the Nuclear Conventions and the systematic updating and extension of the IAEA safety standards that have been initiated in the late eighties as response to the Chernobyl accident.

Both the learning process for enhancing the GNSSR as well as the interactions and processes under the global regime are supported by the World Wide Web. Important examples are the web based systems for operational feedback such as INES, IRS or FINAS or the web support for the verification process under the nuclear conventions.

3.2 Global Nuclear Safety and Security Network (GNSSN)

That part of the World Wide Web that contains nuclear and radiation information - “Global Nuclear Safety and Security Network” (GNSSN) - contains tremendous amounts of more or less important information. Sometimes the information is qualified, sometimes just wrong. The GNSSN is in principle very valuable to support regulators. But on the other hand the information is much and too widespread to be handled effectively.

To make better use of the possibilities of the GNSSN some regional or thematic networks have been developed in the past and are now operated by specific communities.

Examples for regional networks are the Asian Nuclear Safety Network (ANSN) (Fig. 2), the Latin American Forum of Nuclear and Radiological Regulatory Organizations (FORO) or more recently the Forum of Nuclear Regulatory Bodies in Africa (FNRBA).

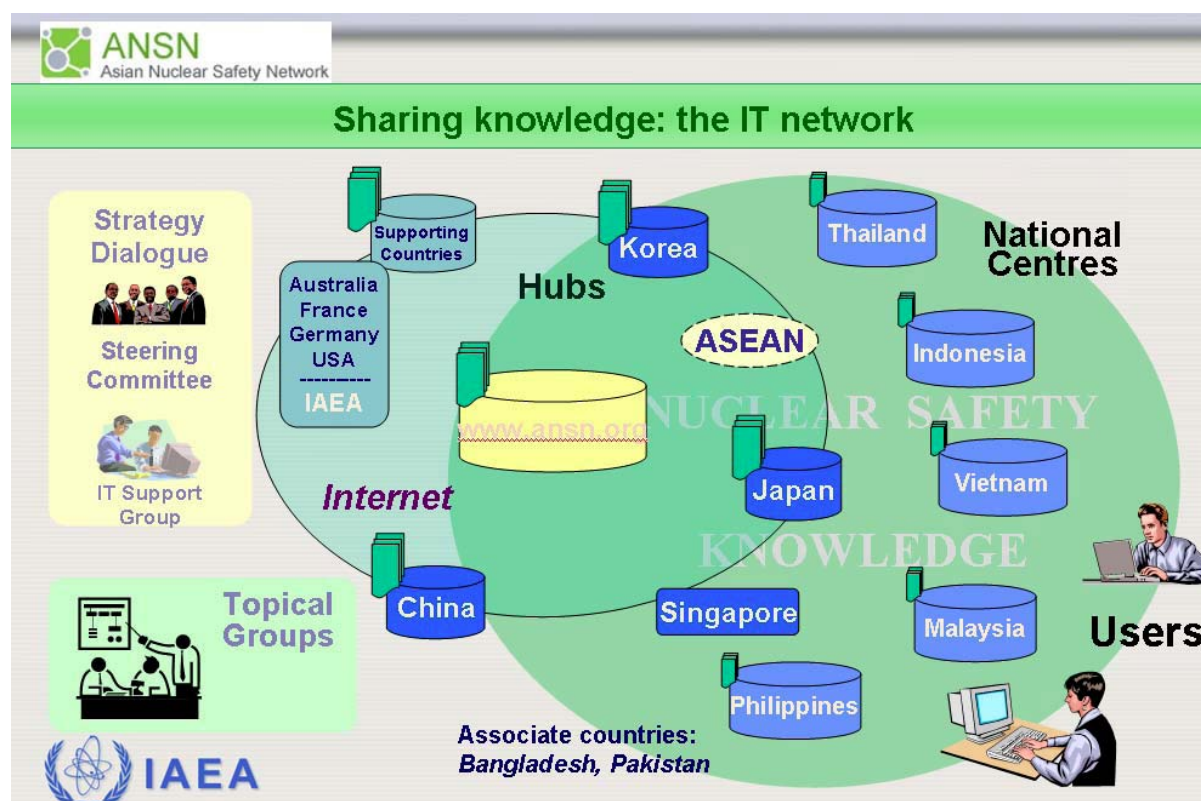


Fig. 2. Example for regional networks – Asian Nuclear Safety Network

Examples for thematic networks are the Websites for the nuclear conventions such as the CNS Website (Fig. 3), the World Nuclear Association (WNA), NucNet, the International

Decommissioning Network (IDN) or the web based systems for sharing operational experience, such as INES, IRS, FINAS.

The screenshot shows a web browser window with the title "Recent Document Activities - Internet-Zugang des BMU". The address bar shows "http://www-cnsweb.iaea.org/home.asp". The browser's menu bar includes "Datei", "Bearbeiten", "Ansicht", "Favoriten", and "Extras". The toolbar shows various icons for file operations and search. The main content area is titled "Convention on Nuclear Safety" and features a navigation menu with "Registration", "Feedback", "Help", and "About". Below this is the IAEA logo and a "Welcome" message. A search bar is present with a "Documents by" dropdown menu set to "Choose Country" and a link to "IAEA.org". On the left, a sidebar contains links to "Home", "Info Page", "National Reports", "Documents Overview", "Questions & Answers Overview", "Contact Points", and "Log Off". The main content area displays "Recent Document Activities" with a table of document entries.

Document Owner	Date	Activity	Symbol	Document
IAEA Secretariat	2009-12-02	Published	AC/2011/ZZ	Timetable for the 5th Review Meeting - Revision 1 Category: IAEA Correspondence · Review Meeting: 2011 Language: English
IAEA Secretariat	2009-12-02	Deleted after being published	AC/2011/ZZ	CNS Brochure - 28 September 2009 Introduction to the CNS and its associated Rules of Procedure and Guidelines Category: IAEA Correspondence · Review Meeting: 2011 Language: English
IAEA Secretariat	2009-12-02	Published	AC/2011/ZZ	CNS Brochure -- December 2009 Introduction to the CNS and its associated Rules of Procedure and Guidelines

Fig. 3. Example of secured thematic network – Convention on Nuclear Safety

This paper presents a portal approach for integrating such activities and for further enhancing the practical use of the GNSSN for regulatory activities.

3.3 Portal approach to the Global Nuclear Safety and Security Network

The concept of the Global Nuclear Safety and Security Regime has been used to define the overall framework and the key elements for the IT based Portal to the Global Nuclear Safety and Security Network. The GNSSN-Portal will be hosted at the IAEA using the GNSSR framework and its main constituents. One important part which has now been developed by the IAEA and some Member States is the Portal for the Multinational Network among Nuclear Safety and Security Regulators – the **RegNet-Portal**.

The structure of the GNSSN-Portal and its content are based on an approach developed in INSAG 21: Strengthening the Global Nuclear Safety Regime. INSAG has developed a schematic picture of the Global Nuclear Safety Regime that can be expanded to cover also security aspects. This schematic picture has been amended by a few elements to support definition and establishment of the Global Nuclear Safety and Security Network Portal.

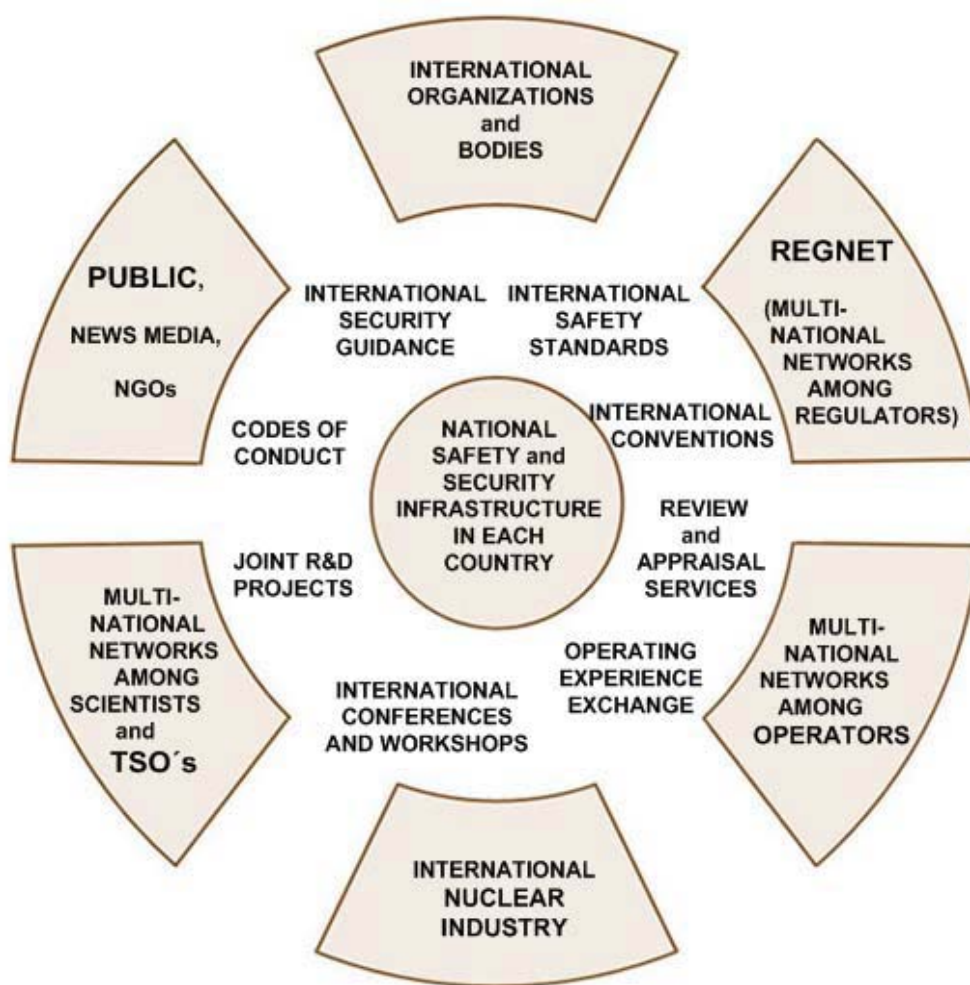


Fig. 4. Key elements for the entry page of the Portal for the Global Nuclear Safety and Security Network

The picture shows three types of key factors contributing to the effectiveness of the GNSSR: first, national and international actors or participants (stakeholders and their networks), second, information resources and instruments and third, interactions.

These three types of factors determine the structure and operation of the GNSSN-Portal:

- National and international actors or participants operate information systems, in particular public or protected/secured websites, as well as regional or multinational networks. Such systems and sites are designed and operated to comply with respective responsibilities, requirements and activities of the owner.
- Information resources and instruments that have been agreed – legally or voluntarily – among respective actors or participants. Such resources or instruments are regularly reviewed and further developed or amended as appropriate. Related documentation and processes today are more and more web-based. Such websites are operated by the dedicated “operator” or “owner” of the resource or instrument.
- Interactions among actors and participants are performed more or less formalized based on mutual agreements or individual actions.

3.4 Multilevel Concept for the GNSSN-Portal

The overall GNSSR and the main activities at the IAEA are agreed by the policy organs and laid down in the IAEA budget and programme. This is a commonly agreed framework. But the different information resources and networks of other actors differ considerably in structure and content. Sites of national regulatory bodies for example have to be designed and operated for specific needs in the given national context.

It would neither be practicable nor useful to try to develop a common structure for the websites of actors or participants of the Global Regime or to establish one global system that contains the content of all **different** actors and participants. It would also not be useful to duplicate the content in an additional global system.

The approach used instead is a Portal for sharing information and knowledge about the established common framework with contributor sites and “interface” pages that enable direct and structured access to the specific information of Member Countries or of international actors. The basic idea is to establish the portal on a server hosted by the IAEA while the nuclear safety and security content is provided and maintained under the responsibility of the respective actor. Therefore the GNSSN-Portal is organized by a step by step approach to relevant content of the GNSSN as part of the World Wide Web. These steps are organized by the following five levels:

- 0: Homepage of the GNSSN-Portal including reference to the global regime GNSSR
- 1: Homepages of a multinational network among specific groups of stakeholders, such as the Homepage of the Regulatory Network - RegNet-Portal
- 2: Contributor Sites of actors
- 3: Interface Pages of actors – with uniform approaches for navigation and retrieval of specific classes/groups of content for each actor
- 4: Direct links to the actor’s content in the World Wide Web

The content in the five levels of the GNSSN-Portal shall be as lean as possible and shall be focussed on main activities important for the effectiveness of the Global Regime.

One view of the Top Level is the GNSSN-Portal Homepage based on the concept of the GNSS Regime as established and further developed with the Member States at the IAEA. This page provides direct access to official GNSSR information and resources available at the IAEA (see Fig. 1).

Another view of this GNSSN top level is amended by a more detailed picture based on INSAG 21 describing the elements of the Global Regime and their interactions in more detail (Fig. 4). This picture can be used for direct access to web-based resources of national and international stakeholders and their networks.

The next GNSSN-Portal level (Level 1) consists of the homepages for the specific portals for actors of the GNSSR. This paper will focus on the Portal for the Multinational Network among nuclear safety and security regulators, the RegNet-Portal.

3.5 Multilevel Concept for the RegNet-Portal

The RegNet-Portal is the Portal for international regulatory cooperation under the Global Nuclear Safety and Security Regime.

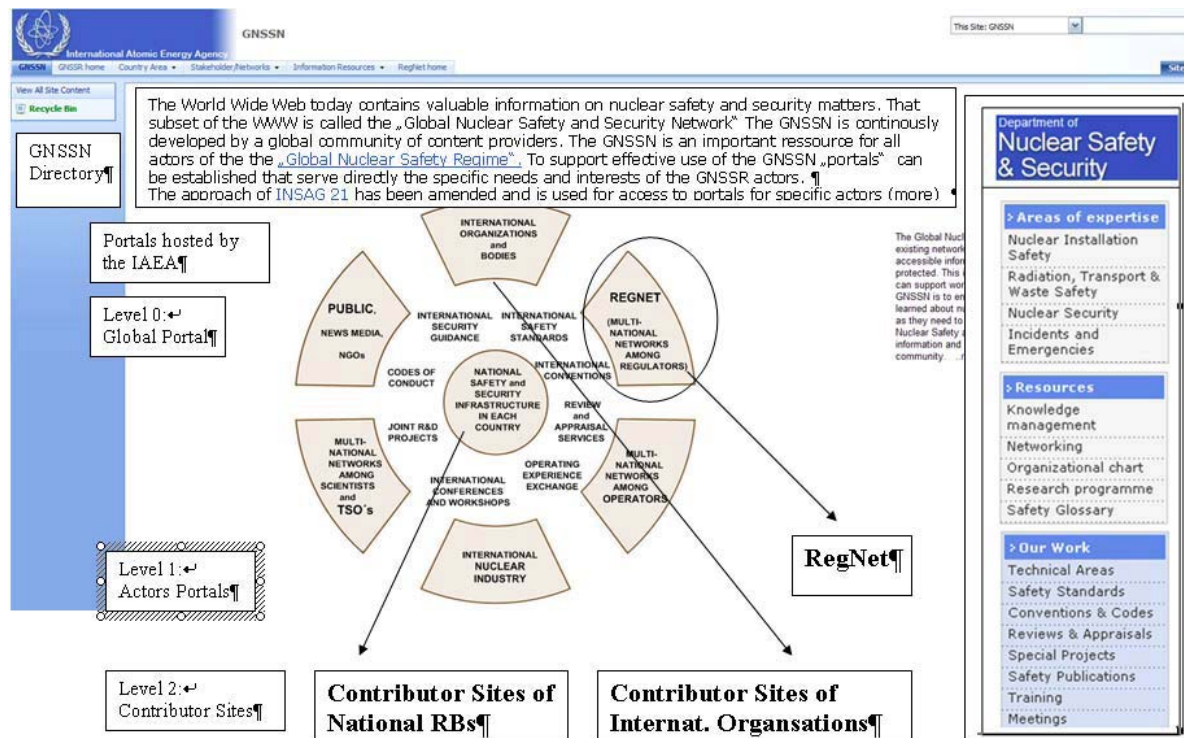


Fig. 5. RegNet in relation to GNSSN and to corresponding Contributors Sites

The RegNet-Portal is organized by four levels

1: RegNet-Portal Homepage	Homepage of a multinational network among nuclear regulatory bodies - Overview and direct access to current international activities and interactions important for regulatory effectiveness
2: Contributor Sites of actors under the Actor's Sites – common structure	Overview following an agreed common structure to the contributions of the participating actors - countries, international organizations, bodies - with direct access through links
3: Interface Pages – with uniform approaches for navigation and retrieval of specific classes/groups of content for each actor	“Executive Summary” for specific information from the actor and its activities
4: Links to content in the World Wide Web	Up to date links to safety and security information of the actor.

All four levels are hosted on a server at the IAEA. Level 1 is maintained by the IAEA in close cooperation with the Member Countries. Levels 2 to 4 are established and maintained under

the responsibility of each actor. The content in the four RegNet-Portal levels shall be as lean as possible and shall be limited to what is necessary to find access to what the contributors have posted on their websites.

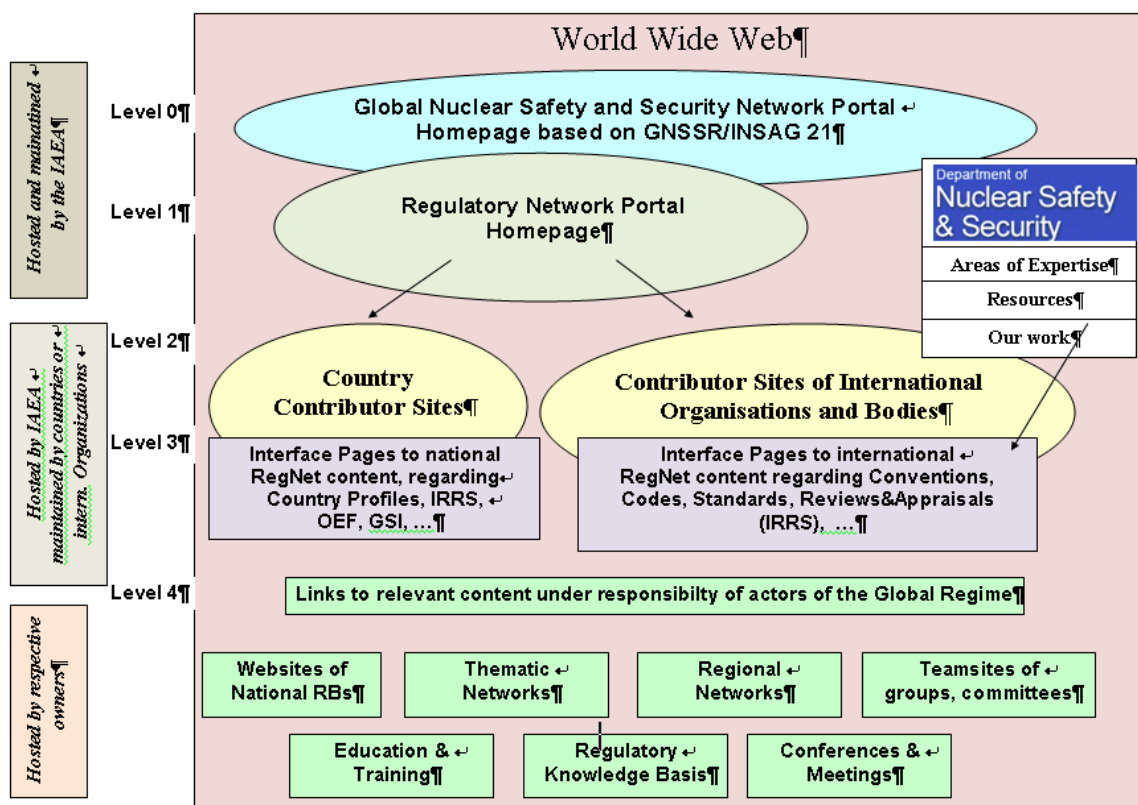


Fig. 6. Multilevel Concept for the RegNet-Portal

Guiding principles to strengthen regulatory effectiveness in the global context have already been formulated in August 2007:

- Ultimate responsibility for the content and quality remains with the respective providers of the information and network operators (process owners);
- Process owners recognize that they are part of a broader community of networks;
- Continuous efforts are made by process owners to make the network visible and conducive to international co-operation;
- There is a striving for common solutions, using best practices and advanced technologies, and for optimal use of resources;
- Agreed-upon commitments are adhered to;
- The sustainability and continuous improvement are ensured.

It was agreed to focus the development of the RegNet-Portal first on:

- IRRS mission and other reviews and appraisals organized by the IAEA,
- operational feedback systems,
- Generic Safety issues.

3.6 Information sharing and collaboration for IRRS Missions

The example of the IRRS is used to describe the layout and function of the level 2 and 3 elements of the RegNet-Portal in more detail.

General information on IRRS Missions is available on the IAEA Homepage. This website is static and gives no current information on ongoing IRRS activities. Some additional information on IRRS missions may be found using internet search tools on websites of some regulatory bodies.

There is common understanding that there should be an easier, more comprehensive overview and access to IRRS activities, reports, methods and lessons learned.

To achieve this, RegNet contains an IAEA-contributor site with all generic information on organising and performing IRRS missions including background, history and schedules. Country specific information shall be made available through the RegNet-Portal. Countries that want to participate can post an IRRS interface page within the RegNet country area for this country. The interface page should be a short, one web page long overview of the country's IRRS activities with links to websites owned by that country where further information is available.

It is up to each participating country to decide, which information shall be made available within the RegNet-Portal and within its own systems. Information can be made publicly available or it can also be exchanged on protected sites.

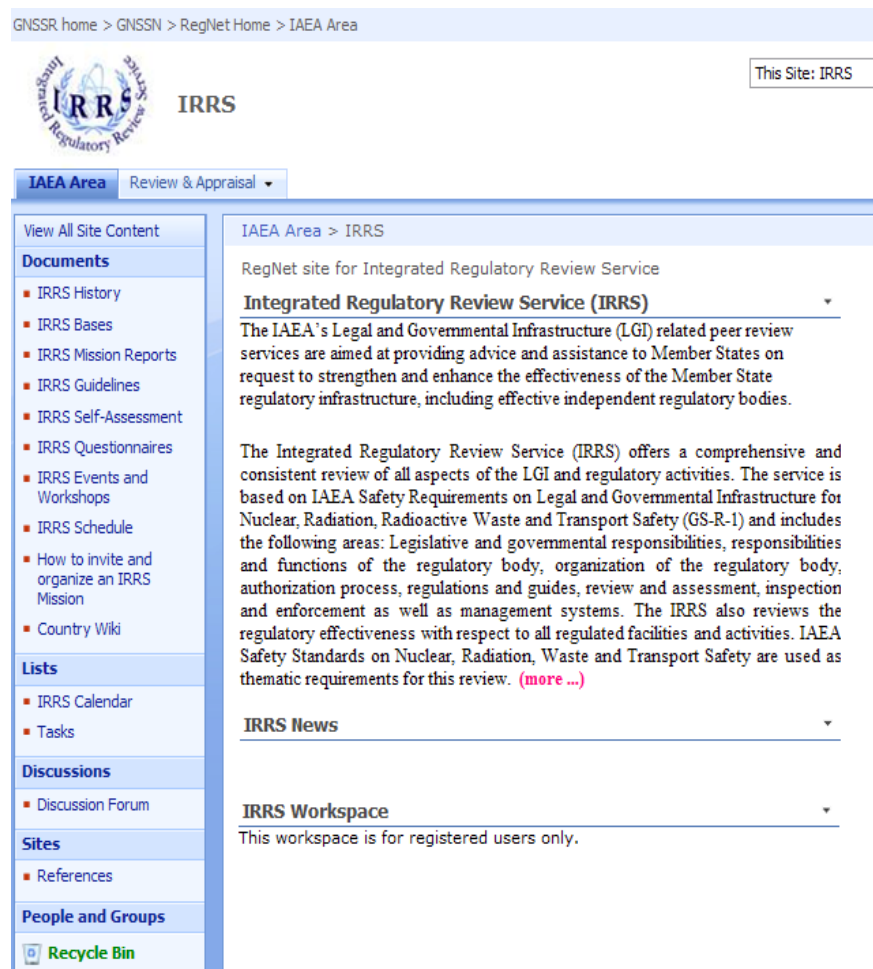


Fig. 7. Screenshot of the IRRS site

4. Summary and conclusions

4.1 Significant development of regulatory and thematic networks and of comprehensive RegNet-Portal

During the past three years the conclusions of the Moscow conference 2006 regarding the “increasing development of information and knowledge management networks to enhance the regulation of nuclear safety and security” have successfully been addressed. The development of regional networks and thematic networks has been made significant progress.

A comprehensive approach for web based international cooperation of nuclear safety and security regulators has been designed and developed. The **RegNet-Portal** now will become operational early next year.

The portal is hosted by the IAEA and uses state of the art information technology for content management and collaboration. The Portal can be used interactively by the participating regulators, international organizations and other bodies.

The further development should be based on a common statute and a steering committee. Experience from the regional networks shall be used.

Resources have already been made available by national and international actors to enable further progress.

4.2 Priority areas for future applications and developments

The RegNet-Portal has significant potentials for improving organizational and administrative activities in international regulatory cooperation such as:

- Shared workspaces for collaboration
- Enhanced exchange and cooperation between the growing number of regional networks
- Cooperation Platform for countries embarking on nuclear power
- Enhanced access to and use of
 - meeting schedules and related documentation
 - standards and reports
- Global Nuclear Safety and Security Directory – Global Nuclear Safety and Security Yellow Pages

Priority areas for the further thematic developments are:

- Entry pages of Country Contributors sites with Country Nuclear Regulatory Profiles following the revised GS-R-1 and other information important for nuclear regulatory cooperation
- IRRS Platform and platforms for other reviews and appraisals such as OSART, EPREV, IPPAS
- Web based platforms for operational experience feedback systems

The added value shall be achieved by enhanced information and knowledge sharing between the different actors by using common contributors’ sites and interface pages with agreed structures.

The Portal approach and technology chosen can easily be adapted to future needs.

4.3 *Need for commitment and leadership of the top management*

The IAEA standard GS-R-3 requires that information and knowledge is managed as a resource. The promotion of global sharing safety and security information and knowledge is most important for the effectiveness of nuclear regulatory systems.

RegNet has been designed and has further to be developed for this objective. Further progress requires commitment and continuous support from the top management level and senior regulators.

All regulatory bodies are invited to join in the development of the RegNet-Portal and to participate in sharing information and knowledge.

The overall objective is that at the next IAEA International Conference on Effective Nuclear Regulatory Systems in about three years further progress with web based regulatory cooperation in particular with the RegNet-Portal can be reported.

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