

Fukui International Meeting on Human Resources Development for Nuclear Energy

March 26th & 27th 2013

Strengthening nuclear safety and IAEA Action Plan after Accident of Fukushima



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International Atomic Energy Agency

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NSAP = Nuclear Safety Action Plan

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introduction: background of NSAP



introduction: goal of NSAP

September 2011:

- adoption of the IAEA Action Plan on Nuclear Safety by the IAEA's Board of Governors.
- unanimous endorsement by the IAEA General Conference.
- **GOAL of NSAP:**

ALL MEMBER STATES GATHER ALL NUCLEAR SAFETY TOOLS TO STRENGTHEN THE GLOBAL NUCLEAR SAFETY FRAMEWORK



“...It is essential that all of us - Member States, the IAEA and other key stakeholders - maintain our sense of urgency and our commitment to implementing the Action Plan in full.”

**Yukiya Amano,
IAEA Director General**



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NSAP - 12 point plan



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Actions by: IAEA Secretariat
Member States
Other Relevant Stakeholders

progress - the big picture

GOV/2013/4: Nuclear Safety Review 2013

GOV/INF/2013/1: Implementation of the IAEA Action Plan on Nuclear Safety



- noteworthy **progress** in strengthening nuclear safety in 2012.
- operational safety level remained high | **there is room for further improvement.**
- long term operation and **ageing** continue to **challenge** NPP and research reactor operators and regulators.
- continued to share lessons learned from the Fukushima Daiichi accident | **IEMs** | **CSS** | **CNS** | **Fukushima Ministerial Conference.**
- continued to **strengthen** regional and international **knowledge networks.**



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progress - International Expert Meetings (IEM)

International Experts' Meetings

- IEM 1 Reactor and Spent Fuel Safety
- IEM 2 Enhancing Transparency and Communication
Effectiveness in the event of a Nuclear or Radiological Emergency
- IEM 3 Protection against Extreme Earthquakes and Tsunamis
- IEM 4 Decommissioning and Remediation



Future IEMs / Conferences

- Effective Nuclear Regulatory Systems April 2013
- IEM 5 Human and Organizational Factors May 2013
- IEM 6 Radiological Assessments 2013/2014

Results

- Chairs Summaries, presentations web site, IEM-reports
- Reports IEM1,2&3 topics to Ministerial Conference December 2012



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progress - NSAP 1
ASSESSMENT OF SAFETY VULNERABILITIES OF NPPs

Safety of Multi-unit Nuclear Power Plant Sites against External Natural Hazards

- Bhabha Atomic Research Centre, India
- share information on safety issues of multi-unit NPP sites
- lessons learned from past earthquakes
- IAEA to develop guidelines for assessment of multiple natural hazards on multi-unit NPP sites

Safety Assessment of Operating Nuclear Power Plants

- European Union (EU) and non-EU safety reassessments (stresstest)
- actions derived from the safety assessments
- recognize a broadly common response

IEM 1 & IEM 3



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progress - NSAP 2

STRENGTHEN IAEA PEER REVIEWS

Peer Review Missions

- SEED Kazakhstan
- INIR 2 Vietnam progress
- OSART Bulgaria (Kozloduy), Czech Republic (Temelin), France (Gravelines) and India (Rajasthan)
- OSART follow up Brazil (Angra 2)
- EPREV Georgia, Pakistan, Russia, Estonia, Latvia, Albania, Vietnam, Croatia, Bosnia and Herzegovina, Croatia, Serbia, Kazakhstan, Lithuania, Armenia and Uruguay

Integrated Regulatory Review Service (IRRS)

- IRRS Korea (Rep. of), Slovenia, Switzerland, UAE, Slovakia, Greece and Finland
- mission schedule for 2013-2015
- further improvements
 - guidelines for Member States
 - mission reporting



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progress - NSAP 4

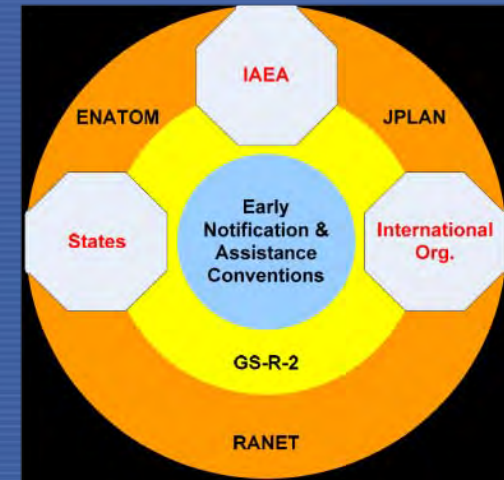
STRENGTHEN EMERGENCY PREPAREDNESS AND RESPONSE

Emergency Preparedness and Response Expert Group (EPREG)

- 1st meeting February 2013
- current international activities
- priorities for future work

Convention Exercises (ConvEx) exercises

- ConvEx exercise calendar for 2013 on USIE



EPREV

- emergency preparedness review service

RANET

- technical meeting February 2013
- updating the registered national assistance capabilities
- IAEA Response and Assistance Network publication



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International Conference on Effective Nuclear Regulatory Systems

- Ottawa Canada April 2013
- important step forward in further strengthening regulatory Systems

Integrated Regulatory Review Service (IRRS)

- team leader meeting
 - share experience and further strengthen the effectiveness of national regulatory bodies
 - 13 senior regulators from 13 Member States
 - self-assessment process
 - organization of missions
 - importance of mission follow-ups



progress - NSAP 5

STRENGTHEN THE EFFECTIVENESS OF OPERATING ORGANIZATIONS

IAEA - WANO MoU (17/9/2012)

- scheduling WANO & OSART missions
- enhancing information exchange
- collaborating in serious events

Pre-operational safety culture

- technical meeting, South Africa
- 152 participants from 27 Member States
- technical, behavioural and social science approaches to safety culture improvement were discussed

OSART

- 175th OSART mission since 1982
- some Member States not hosted OSART since the mid-1990s



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progress - NSAP 6

REVIEW AND STRENGTHEN IAEA SAFETY STANDARDS AND IMPROVE THEIR IMPLEMENTATION

Safety Standards Review

- CSS progress report to DG Amano - November 2012

2nd Extraordinary Meeting of Convention on Nuclear Safety

- results analysed to identify further improvements

Safety Guides

- Pilot Review
 - design of the Reactor Coolant System and Associated Systems
 - design of Reactor Containment Systems
 - accident management programmes



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progress - NSAP 7

IMPROVE THE EFFECTIVENESS OF THE INTERNATIONAL LEGAL FRAMEWORK

Convention on Nuclear Safety (CNS)

- working group on Effectiveness and Transparency
- report to 2014 Review Meeting
- actions to strengthen CNS



CNS and the Joint Convention

- working group of Experienced Officers
 - share experiences
 - identify potential improvements to the review processes

Legislative assistance programme

- assistance to 7 Member States to review national nuclear legislation



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progress - NSAP 8 & 9

EMBARKING COUNTRIES AND CAPACITY BUILDING

Integrated Review of Infrastructure for Safety (IRIS)

Integrated nuclear infrastructure review missions (INIR)

- technical meeting December 2012
- self-assessment methodology
- participants from 40 Member States



Regulatory Cooperation Forum (RCF)

- European Commission Nuclear Safety Cooperation Instrument
- share experience in providing support and assistance for regulatory bodies in countries embarking on nuclear power programmes

Steering Committee on Regulatory Competence

- 4th Technical Meeting December 2012.
- review of work programme for 2013 for education and training in nuclear safety
- seminar - Systematic Assessment of Regulatory Competence Needs (SARCoN).



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IEM 4 - Decommissioning and Remediation after a Nuclear Accident

- 200 experts, 40 Member States
- identified need for improvement to
 - Guidance & Sharing of knowledge
 - Review services for planning of decommissioning + remediation
- practical definition of 'safe'
- IAEA Report

MODARIA project

- 151 participants from 43 Member States, focus on 4 themes
 - remediation of contaminated areas
 - uncertainties and variability
 - exposures and effects on biota
 - marine modelling.
- 2nd Technical Meeting for MODARIA in November 2013



progress - NSAP 11

ENHANCE TRANSPARENCY AND EFFECTIVENESS OF COMMUNICATION

Fukushima Ministerial Conference

- GOV/INF/2013/2
- reports of the three international experts' meetings(IEMs)

IAEA Operations Manual for Incident and Emergency Communications

- distributed to all Member States contact points

INES

- draft of the Guidance on application of the International Nuclear and Radiological Event Scale (INES) developed



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progress - NSAP 12

RESEARCH AND DEVELOPMENT

TSO Conference

- Challenges Faced by Technical and Scientific Support Organizations (TSOs) in Enhancing Nuclear Safety and Security
- China 2014 / 3rd TSO conference

Symptom-based Accident Management Toolkit (SAMT)

- accident progression and accident consequences



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progress - what still has to be done?

STRENGTHENING NUCLEAR SAFETY

- “**Human error** bears a potential for jeopardizing defence in depth ...” - errors of commission in particular.
 - Nuclear organizations tend to take an inadequate, ad hoc approach to **safety culture** in their nuclear operations. As a result, changes in safety culture have been insufficient and unsustainable, whereas good safety culture **requires** a systematic, **long term commitment**.
 - Recent events point to the fact that nuclear installations **need to be better prepared** to manage the unexpected.
- **Newcomer** countries do not use the Site and External Events Design (SEED) review service.
- **SAMGs** were **insufficient** in scope, not fully trained, or non-existent in some NPPs.



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progress - what still has to be done?

STRENGTHENING REGULAR STRUCTURE AND EFFECTIVENESS

- **Existing Nuclear** Programmes: Review of 44 IRRS missions (31 at NPP MSs) worldwide found that **Requirement 24**, “*demonstration of safety for the authorization of facilities and activities*” **was most often referred to** among Regulators reviewed.



- **Newcomer Countries**: identified **many common weaknesses** and challenges: weak regulatory independence, lack of technical support, limited education and training programmes, short project schedules.
- Regulatory Infrastructure for radiation safety: new Member States often **limited, or no regulatory framework in place** to ensure the safety of people and the environment



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progress - what still has to be done?

STRENGTHENING EMERGENCY PREPAREDNESS

- **Eight EPREV** missions in 2012, the highest number since the programme began in 1999.
- States' **increasing interest in EPR**, will require more EPREV missions in the coming years.



- IACRNE, et al, agreed to **enhance international response arrangements** in an emergency as well as in the post-emergency phase based on lessons identified in response to the Fukushima Daiichi accident (December 2012, Paris meeting)
- Developing **minimum required guidelines** that would help to harmonize response capabilities with some Member States for international assistance; to be effective, Member States need to comply with them.



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progress - comprehensive report

56th General Conference IAEA

- Opening address dglAEA, September 17th 2012
- "In December, the *Fukushima Ministerial Conference on Nuclear Safety*, organized by the Government of Japan and the IAEA, will take place in Fukushima Prefecture. At this Conference, we will present a report outlining the conclusions of the international expert meetings held so far. We will also prepare a comprehensive report on the Fukushima Daiichi accident, to be finalized in 2014."

67th Regular Session of United Nations General Assembly

- Statement dglAEA, November 5th 2012.
- "Next month, the IAEA and the Government of Japan will hold a *Ministerial Conference on Nuclear Safety* in Fukushima Prefecture. At this Conference, we will present the conclusions of international expert meetings on issues such as reactor and spent fuel safety, responding to tsunamis and earthquakes, and transparency and communication. We will also prepare a comprehensive report on the Fukushima Daiichi accident, to be finalized in 2014."



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address to participating countries today

human resources / capacity building

- NSAP related issues
- IAEA presentation today

IAEA meetings / services

- International Conference on Human Resource Development for Introducing and Expanding Nuclear Power Programmes: Building and Sustaining Capacity, April/May, Vienna
- NSAT dashboard

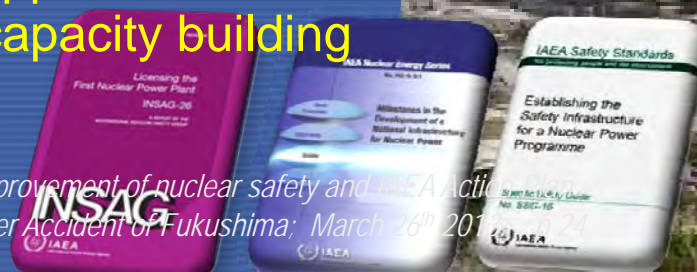


address - HR capacity building

- Better capability to provide support including lessons learned
- IAEA Guide Establishing the Safety Infrastructure for a NP Programme
- Lessons Learned being incorporated in several IAEA documents (e.g. Milestones and Infrastructure Status Evaluation)
- More participation in the Regulatory Cooperation Forum
- Self-assessment methodology for capacity building issued
- A document on managing regulatory body competence has been developed
- A Safety Education and Training Peer Review Service (ETPRES) is established
- Modular packages for assistance
- Additional guidance documents and evaluation methodology for INIR missions
- IAEA ready to support Member States in their capacity building activities



Improvement of nuclear safety and IAEA Activities after Accident of Fukushima; March 26th 2011



address - IAEA-services

IAEA Nuclear Safety Action Plan Dashboard

(click [here](#) to display the dashboard)



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Map of IAEA IRRS Missions

Meetings News Reports

- Fukushima Ministerial Conference on Nuclear Safety, 15-17 December 2012

International Experts Meetings

- International Experts' Meeting on Decommissioning and Remediation After a Nuclear Accident, 28

IAEA Action Plan on Nuclear Safety

A Ministerial Conference on Nuclear Safety adopted a Declaration that requested the Director General to develop a draft *Action Plan on Nuclear Safety*. In September 2011, the IAEA Action Plan on Nuclear Safety was adopted by the IAEA's Board of Governors and subsequently unanimously endorsed by the *IAEA General Conference*. The ultimate goal of the *Action Plan* is to strengthen nuclear safety worldwide.

Action Plan Dashboard

The *IAEA Action Plan for Nuclear Safety* dashboard is dedicated to sharing

Mission Maps

- IAEA Integrated Regulatory Review Service (IRRS) Missions, 2006-2012
- IAEA Operational Safety Review Team (OSART) Missions, 2006-2012
- IAEA Emergency Preparedness and Review Services (EPREV) Missions, 2006-2012



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conclusions

- With the Nuclear Safety Action Plan the IAEA provides guidance to all MS to gather all nuclear safety tools to strengthen global nuclear safety.
- In 2012 noteworthy progress has been made in strengthening nuclear safety. operational safety level remained high however there is room for further improvement.
- The experiences from the Fukushima Daiichi accident have been shared worldwide in IEMs, CSS, CNS and the Fukushima Ministerial Conference. This has contributed to the continued strengthening of regional and international knowledge networks.
- efforts are needed to further strengthening effectiveness and knowledge of regulatory bodies and operating organisations and to achieve further improvements of nuclear safety .
- The IAEA safety review services can contribute to the improvement of effectiveness and knowledge. Efforts have been made to enhance the accessibility to these services. Countries are encouraged to request these services from the IAEA.
- The IAEA is preparing a comprehensive report on the Fukushima accident (to be issued in 2014).



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Thank you!



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