



United Arab Emirates



International Conference on Challenges Faced by Technical and Scientific Support Organisations (TSOs) in Enhancing Nuclear Safety and Security

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UAE White Paper: Guiding Principles



UAE Government's goal to **exceed** international standards in its evaluation of nuclear power and any deployment of nuclear facilities within the UAE

ANR Presentation Slide 2

Goal 1:
Complete operational transparency

Goal 2:
Highest standards of non-proliferation

Goal 3:
Highest standards of safety and security

Goal 4:
Close cooperation with the IAEA

Goal 5:
Partnership with governments and companies of responsible nations

Goal 6:
Long-term sustainability

16 August 2011



FANR Vision and Mission

Vision

To ensure long-term safety, security and sustainability in the peaceful uses of nuclear energy and radioactive materials in the UAE by establishing world-class regulations and supervising their implementation.

Mission

To protect the public, workers and the environment by conducting nuclear regulatory programmes in safety, security, radiation protection and safeguards by fulfilling the following key objectives:

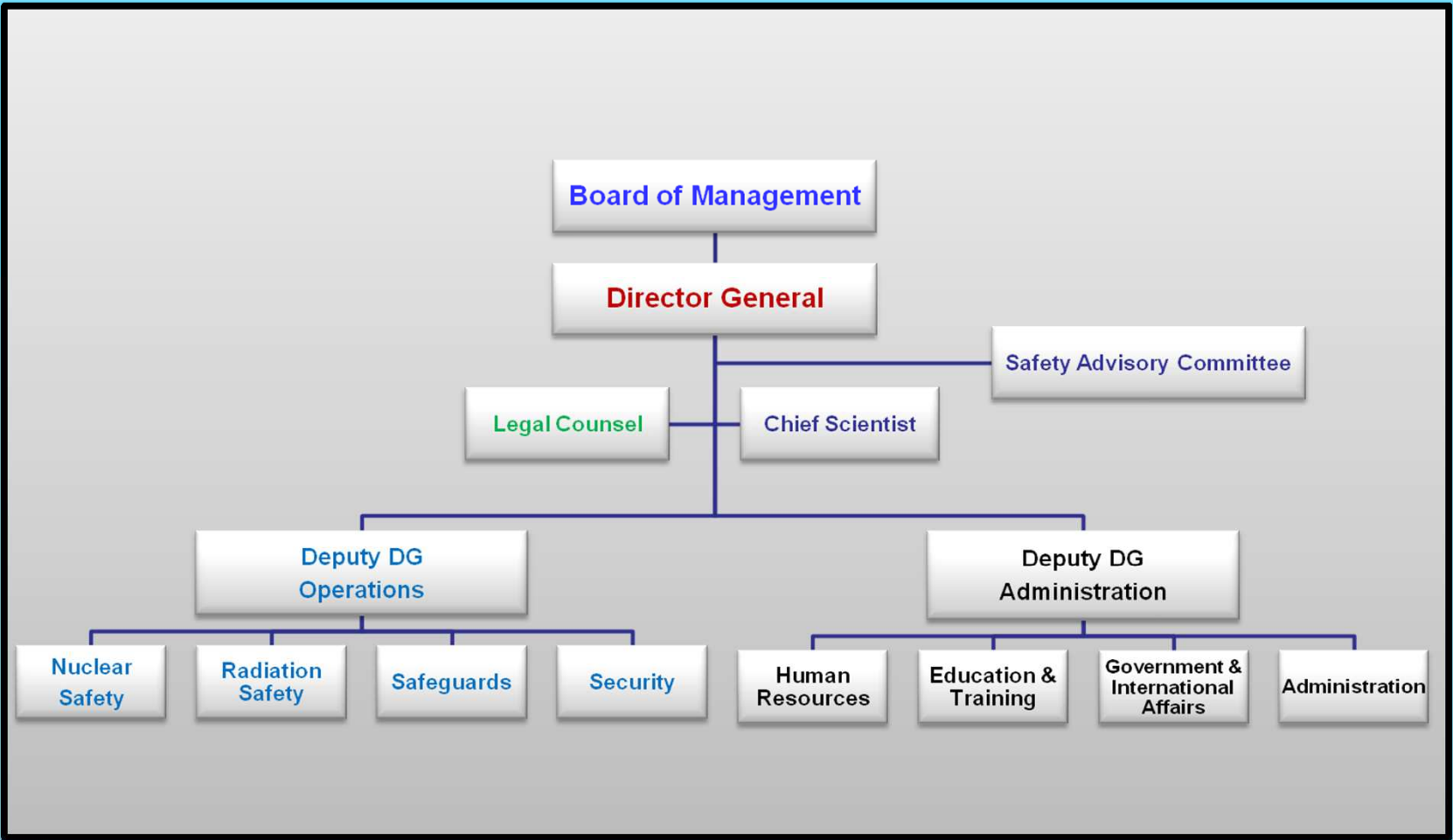
- ❖ Licensing and inspection activities, which are benchmarked against international best practices
- ❖ Capacity building strategies to ensure sustainability
- ❖ Appropriate oversight of the obligations under the international treaties, conventions and agreements in the nuclear sector entered into by the UAE
- ❖ Administrative standards, which support excellence in regulation



International Basis for UAE Nuclear Regulatory Framework

- ❖ The UAE has committed to implementing:
 - The Non-Proliferation Treaty (NPT)
 - Comprehensive Safeguards Agreement with Additional Protocol
 - The Convention on Nuclear Safety
 - The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
 - The Convention on the Physical Protection of Nuclear Material and its amendment
- ❖ The Vienna Convention on Civil Liability for Nuclear Damage (promulgated)

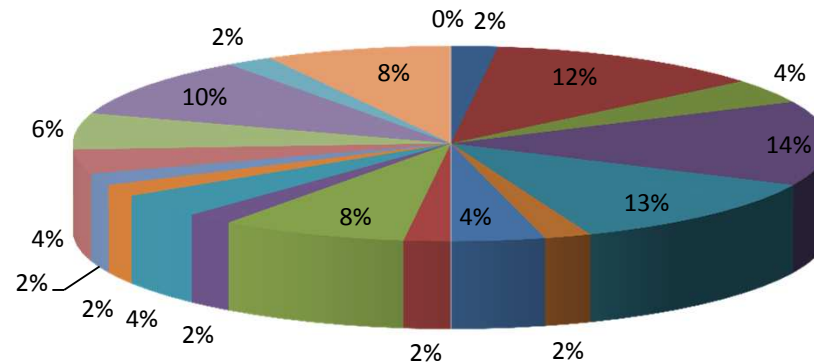
FANR Organisational Chart



Workforce

Current : 105 employees
 Planned for 2010: 120 positions
 Nationalities: 22 different nationalities (excluding Emiratis)

FANR – Distribution of Nationalities in 2010

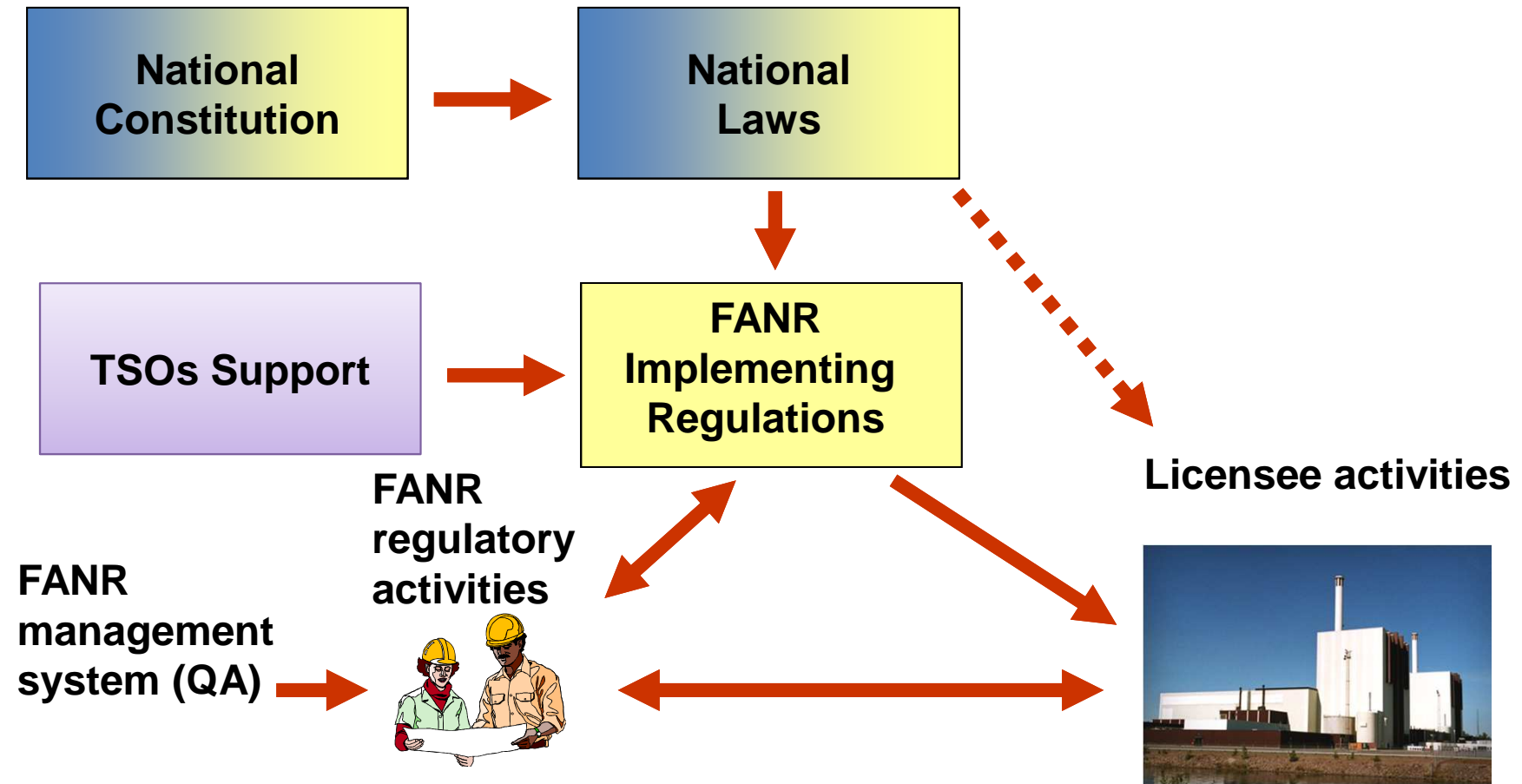




What roles do the following play in the licensing process?

- 1. Government**
- 2. Regulator**
- 3. Regulatory Body of Country of Origin (RBCoO)**
- 4. Technical Support Organisations (TSOs)**

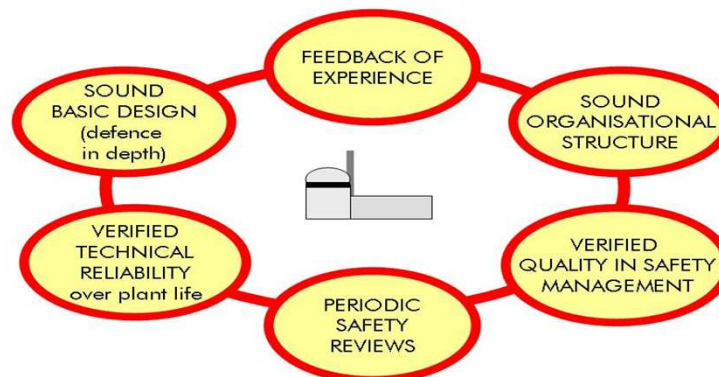
A Consistent National Regulatory Framework



Key Elements of Regulatory Oversight (1/5)

(1) Role of Government

- ❖ Promulgated *Federal Law by Decree No 6 of 2009* to govern the nuclear sector in the UAE
- ❖ Assigned the licensee the responsibility for taking all steps necessary to reduce the risk of an accident to a level that is as low as reasonably achievable
- ❖ Commitment to safety regulations that define licensee obligations aimed at creating and maintaining safety using international guidance



- ❖ Established FANR to review, inspect and conduct enforcement activities to ensure that licensees comply with their safety obligations



Key Elements of Regulatory Oversight (2/5)

(2) Role of the Regulator (FANR)

- ❖ FANR has sole responsibility for licensing Braka 1& 2 nuclear power plants in the UAE
- ❖ Develop and maintain appropriate and effective implementing regulations and associated regulatory guides
- ❖ Review applications and grant licences
Inspect licensees' execution of their responsibilities
- ❖ Take enforcement actions (when needed)
- ❖ Analyse incidents and operating experience
- ❖ Maintain preparedness for nuclear accidents
- ❖ Actively inform, report and promote transparency
- ❖ Contribute to implementing relevant international obligations, including the State System of Accountability for and Control of Nuclear Material (SSAC)



Key Elements of Regulatory Oversight (3/5)

(2) Role of the Regulator (FANR)

- ❖ Establish and manage special register(s) of radioactive sources, occupational doses and radioactive releases into the environment
- ❖ Contribute to developing competence and knowledge (i.e. via research & development)
- ❖ License import or export of any Regulated Material into or from the State
- ❖ License the transportation of any Regulated Material within the State
- ❖ Introduction or removal of any Regulated Material to or from any Nuclear Facility
- ❖ Storage of any Regulated Material within the State
- ❖ Disposal of any Regulated Material within the State



Key Elements of Regulatory Oversight (4/5)

(3) Role of RBCoO [KINS]

FANR seeks strong bilateral cooperation with the Korean Institute of Nuclear Safety (KINS):

- ❖ Overview of the Korean regulatory framework and process for licensing of the reference plant
- ❖ Access to technical information related to the safety assessment of the reference plant
- ❖ Understanding of administrative and project management support for the licensing process and other significant KINS projects
- ❖ Workshops and meetings between KINS and FANR experts to exchange information on safety assessments of APR 1400
- ❖ Cooperation on approaches to support the development of UAE human resources in the regulatory sphere



The Principle for Licensing Country of Origin Design

- ❖ The applicant's Preliminary Safety Analysis Report (PSAR) must :
 - Show how the design complies with FANR requirements for safety, security, and safeguards
 - Reference the design licence approval by the RBCOO and related safety documents
 - Identify any differences between the reference design and the UAE design
 - Describe independent verification of the safety assessment of the final UAE design
 - Describe the management system that controls the design
- ❖ The applicant will provide access to the design base and methods, design data, codes and standards, equipment procurement specifications and other information relevant to safety from the nuclear power plant designer and the RBCoO



Key Elements of Regulatory Oversight (5/5)

(4) Role of Technical Support Organisations

Support FANR in the review and evaluation of the licence submitted by the applicant:

- ❖ Selection of a site for the construction of a nuclear facility
- ❖ Preparation of a site for the construction of a nuclear facility
- ❖ Construction of a nuclear facility
- ❖ Commissioning of a nuclear facility
- ❖ Operation of a nuclear facility
- ❖ Closure or a change in the closure date of any nuclear facility
- ❖ Decommissioning of a nuclear facility
- ❖ Modifications having significance on safety of the management system and organisational arrangements of the structure, systems and equipment of /or contained in any nuclear facility
- ❖ Possession, use, manufacture or handling of any Regulated Material or part of any Regulated Material in the State



**How can TSOs contribute to finding synergies
between safety and security?**



Use plant-specific Probabilistic Risk Assessments (PRAs)

- ❖ Promote the use of a PRA to generate both the *cut sets* for safety assessments and *target sets* for security assessments
 - All plant modes and equipment configurations
- ❖ Identify plant structures, systems, and components (SSCs) the failure, loss, destruction, or incapacitation of which would result in core damage and uncontrolled radiological releases
- ❖ Provide physical protection for these SSCs against malicious acts
 - Measures to detect, delay, respond to malicious acts
 - Perform timeline analysis consistent with the Design Basis Threat (DBT)
- ❖ Assess safety security interface early on during the design phase
 - Safety or security initiated changes should be assessed for implication on the other prior to implementation
 - During maintenance, address SSCs that cannot be promptly restored either by an operator in the control room or by a designated operator stationed locally for that purpose



UAE Capacity-Building

- ❖ Current: core team of experienced international personnel in nuclear safety who have a strong training and mentoring background
- ❖ Mid-term: maintain experienced international personnel and develop a skilled cadre of Emiratis in key areas of responsibility
- ❖ Long-term: establish skills of nuclear expertise while ensuring appropriate support from international experts and organisations
- ❖ Main focus on increasing the UAE's human resources in the nuclear sector – *“continued education and training constitutes a cornerstone of the critical infrastructure necessary to sustain a nuclear power programme”*.

UAE White Paper
- ❖ Coordination for the development of infrastructure for capacity-building for is a national effort involving:
 - Khalifa University (KUSTAR)
 - FANR
 - ENEC



What process should a regulator body use to contract TSO?

The regulatory body will use the appropriate process in line with State policy



FANR Approach to Selecting TSOs

- ❖ FANR identified potential TSOs and advertised its interest
- ❖ Three-stage tender process:
 - First Stage: **Written RFP Response** wherein the bidders provide their technical and commercial responses. FANR shortlist bidders to participate in the second stage
 - Second Stage: **Technical Presentation**. FANR further reduced the number of bidders in the RFP process.
 - Third Stage: the final shortlisted bidders submit their **Final Tenders** in response to an Invitation to Submit a Final Tender (ITSFT)

❖ Key highlights of the tender process:

- FANR will contract with a limited number of TSOs to deliver the review activity
- Bidders may form business alliances and / or use selective sub-contracting to improve their delivery capabilities in specialist areas
- Bidder responses evaluated by adopting a combined commercial and technical score

Conclusion

TSOs - Key Role in Supporting Regulators to Provide Needed Expertise

Issues and Challenges

- ❖ Certain information will be sensitive both from the security and the proprietary intellectual property point of view
 - Establish systems to appropriately identify and protect such information
- ❖ Quality control and consistency in presentation of documents
 - Interdependencies between various TSOs
 - A TSO may be required to share documents or communicate with another TSO
 - Questions should be focused, not open-ended, and should include the appropriate basis
- ❖ The TSO is not entirely independent; it works at the request of the regulator
 - Any advice expected to reflect the established regulatory framework
 - Any conflict with positions adopted by the national regulator must be addressed internally; TSO should raise any/all concerns
 - Cannot disseminate information to the public or publish without approval
 - TSO does not interact independently with applicants/licensees