UAE overall national framework for emergency preparedness and response

IAEA-EPReSC 9th Meeting
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United Arab Emirates

Population at 2017:
Approx. 9.5 M

Total Area:
83,600 km²

Emirates:
- Abu Dhabi
- Dubai
- Al Sharjah
- Ajman
- Umm Al Quawain
- Fujairah
- Ras Al Khaimah

BNP location: AP
Around 282 km from Abu Dhabi
UAE Policy on the Evaluation and Potential Development of Peaceful Nuclear Energy

Complete operational transparency

Highest standards of non-proliferation

Highest standards of safety and security

Close cooperation with IAEA and conform its standards

Partnership with Governments and firms of responsible nations

Long-term sustainability

Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy
UAE legal framework on emergency preparedness and response is based on:

- The federal Law by Decree No. 6 of 2009. This Federal Law aims to develop and regulate the Nuclear Sector in the Country towards peaceful purposes. It establishes FANR to be the regulatory body for the nuclear sector.
- The Federal Law by Decree No. 23 of 2006, concerning Civil Defense in the UAE Ministry of Interior. This Federal Law illustrates the responsibilities of the Civil Defense to cope with natural or man-made risks.
- The Federal Law by Decree No. 2 of 2011, which established the National Emergency, Crisis and Disasters Management Authority (NCEMA) as the national coordination entity for all national emergencies.
The National Emergency Management System is documented in the General Framework on National Response (all hazards) under the leadership of the National Emergency Crisis and Disaster Management Authority (NCEMA).

The Ministry of Interior has an emergency plan for all hazards.

- At the federal level, the UAE Government has a Support Plan for all emirates to provide assistance if the local resources were not sufficient.
- Each emirate has a local emergency plan based on its own activities.
FANR Regulations

- FANR-REG-12 Emergency Preparedness for Nuclear Facilities
- FANR-REG-15 Requirements for Off-site Emergency Plans for Nuclear Facilities
- FANR-REG-24 Basic Safety Standards for Facilities and Activities involving Ionizing Radiation other than in Nuclear Facilities
Framework document and plans

- General Framework on National Response
- General Framework for Nuclear and Radiological Emergency Response
- Plan for dealing with Nuclear or Radiation accidents occurring more than 300 km from UAE boundaries
- BNPP On-Site Plan
- BNPP Off-Site Plan
- BNPP Media Plan
- MOI CBRN Plans
- Supporting entities plans and procedures (e.g. health, environmental, food control, foreign affairs)
- Others
Introduction

UAE activities since last EPReSC meeting

Conclusion
EPR activities since last EPReSC meeting: EPREV follow up mission (September 2019)

- Some numbers about the UAE efforts in response to the 2015 EPREV report (only during 2019):
  - 18 focal points assigned by stakeholders
  - 11 meetings among focal point and subject matter experts
  - > 300 hours-person in deliberations
  - A number of documents elaborated, revised and improved
  - > 50 documents shared with IAEA

- IAEA overall impressions
  - “The team is genuinely impressed with the commitment to EPR in the country
    - Version 4 of the off-site plan
    - Version 3 of the on-site plan
    - Numerous drills and exercises
  - It is clear that there is excellent cooperation between organizations at all levels of government and with the operating organization
  - Clear and measurable progress has been made for every finding from the 2015 EPREV mission”

- 10 out 11 2015 EPREV findings closed
EPR activities since last EPReSC meeting: Full scale exercise (November 2019)

- **Rehearsal**
  - Implemented on October 1st
  - NAWAH, off-site entities and national levels entities activated their emergency operations centres as applicable
  - IAEA also participated and commended the rehearsal

- **Exercise**
  - Implemented on November 5th
  - NAWAH, off-site entities and national levels entities activated their emergency operations centres
  - Evaluation activities performed by FANR and NCEMA
  - As requested by the IAEA, a ConvEx-2e was implemented in order to:
    - Support IAEA’s role on prognosis and assessment
    - Enhancing FANR capabilities to liaise with the IAEA
EPR activities since last EPReSC meeting: Arrangements for the workshop on transition and termination

- An international “workshop on Emergency transition and termination in the UAE” is under implementation
- It is planned to be implemented in February 2020
- The main purpose of the Workshop is to analyse the existing status and evaluate gaps in the UAE infrastructure which may need to be addressed in the near future
- Participants will include among others:
  - Representatives from Japan, Ukraine and Belarus who will share their experience on the topics.
  - ICRP scientific secretary
  - Representatives from the IAEA
  - Relevant UAE entities
EPR activities since last EPReSC meeting:
Kick-off meeting for the ConvEx-3-2021

- In preparation for the meeting and for the arrangements in the coming years. The UAE entities approved a COnvEX-3/2021 project charter defining the project management foundation.
- The first coordination meeting for the ConvEe-3/2021 was implemented in Abu Dhabi from 20 to 21 November.
- IAEA invited all IACRNE members and GCC countries.
- FANR invited to all relevant UAE participants.

Some conclusions:
- The exercise dates were initially discussed (2021 Q4).
- A Join UAE presented national objectives, organization and envisaged players.
- An overall joint work plan was developed and agreed.
- A general timeline was discussed.
- The next coordination meeting soon next year.
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Conclusion

- The UAE system for handling nuclear emergencies is well-established.
- EPREV mission in 2015 and the follow up in 2019 were very useful in terms of the implementation of further improvements.
- Transition and termination are areas that need some improvement. Accordingly, the UAE is taking concrete actions towards evaluating the gaps which may need to be addressed in the near future.
- UAE is honored to host ConvEx-3/2021 and is working hard towards its implementation in coordination with the international community.
Emergency Preparedness and Response: UAE Practical Approach
Shaima Abdulla Al Mulla
Nawah Emergency Preparedness Director
Safety Moment

Safety is the overriding priority at ENEC, Nawah and Barakah One Company.

We are committed to the safety of:

• Our employees
• The community
• The environment
Agenda

• Nuclear Emergency Preparedness in the UAE
• Practical Application of Emergency Preparedness
• Unified Stakeholder Response
• Onsite Emergency Response Organization
• Facilities and Equipment
• Drill and Exercise Program Performance Monitoring
• Offsite Emergency Response Organization
Nuclear Emergency Preparedness in the UAE

The overall objective of Emergency Preparedness in the UAE is to ensure that the Barakah Nuclear Energy Plant along with their offsite stakeholders are capable of implementing adequate measures to protect public health and safety in the event of a radiological emergency.

Emergency Preparedness does not consider probability of an event and is the last line of defense to protect the health and safety of the public. As such it requires:

- a constant state of readiness
- well trained responders
- State-of-the-art facilities, systems and equipment
Nuclear Emergency Preparedness in the UAE

The overall goal is to be recognized as a world leader in Nuclear Emergency Preparedness; through international recognition by consistently meeting or exceeding the performance standards of the top nuclear power plants in the world. This will be facilitated by:

- A multi-cultural organization
- Top experienced professionals in Emergency Preparedness
- World-class emergency response systems, equipment and facilities
Practical Application of the Emergency Preparedness Program

Emergency Preparedness practical approach for all activities associated with developing, conducting, supporting and maintaining Emergency Preparedness Program is accomplished by the following;

• Maintaining the Onsite Emergency Response Plan, and its associated implementing procedures
• Assuring the 24/7 operational readiness of Barakah emergency response facilities, systems and equipment
• Effectively trained response personnel assigned to the Onsite Emergency Response Organization (ERO) and assist the training efforts of the Offsite Response Organization (ORO).
Practical Application of the Emergency Preparedness Program (Cont…)

• Develop, conduct, and evaluate emergency preparedness drills that effectively implement the Onsite and Offsite Emergency Response Plans.

• Assist the Offsite Stakeholders in the development and implementation of their emergency preparedness and public education programs.

This comprehensive program focused on these areas, allow for a straightforward approach that effectively demonstrates our commitment to protect the health and safety of the public and environment from a potential radiological event in the area surrounding the Barakah Nuclear Energy Plant.
Unified Regulatory Requirements

Federal Law by Decree No. (6) of 2009 concerning the peaceful uses of nuclear energy

FANR REG - 15
Offsite Emergency Response Plan
Offsite Supporting Plans
Offsite Emergency Preparedness Implementing Procedures

FANR REG - 12
Onsite Emergency Response Plan
Onsite Emergency Preparedness Implementing Procedures

Offsite Emergency Response Organization

Onsite Emergency Response Organization
Unified Coordination

Managing and Leading the Offsite Emergency Preparedness Program

NCEMA, in coordination with Nawah and MOI, is responsible of the establishment and management of the Emergency Preparedness of the Offsite Emergency Response Organization.

Managing and Leading the Onsite Emergency Preparedness Program

Nawah Emergency Preparedness is responsible of the establishment and management of the Emergency Preparedness Program of the Onsite Emergency Response Organization.
Unified Emergency Plans and Procedures

1. Assignment of Responsibility
2. Onsite/Offsite Emergency Organization
3. Emergency Support & Resources
4. Emergency Classification
5. Notification Methods and Procedures
6. Emergency Communications
7. Public Education and Information
8. Emergency Facility and Equipment
9. Accident Assessment
10. Protective Response
11. Radiological Exposure Control
12. Medical and Public Health Support
13. Recovery and Reentry
14. Exercise and Drill
15. Radiological Emergency Training
16. Responsibility for the Planning

Barakah NPP Onsite Emergency Plan

National Offsite Emergency Response Plan for Barakah NPP

On-site and Offsite Emergency Plan Implementing Procedures

IAEA
NRC
FANR
On-Shift Emergency Response Organization (ERO) Staffing

Diagram represents the emergency plan minimum on-shift staffing levels

On-shift ERO staffing and training for permanent and contract staff is the responsibility of the line organization

Emergency Preparedness provides
- Program oversight
- Training modules
- Train the trainer support
- Conducts training as available
On-Site Emergency Response Organization Staffing

On Call ERO Staffing based on 5 teams of 44 members.

Emergency Operations Facility
18 Positions

Technical Support Center
13 Positions

Media Center
2 Positions

Operational Support Center
11 Positions
Emergency Response Organization Training

Initial ERO Training
• Quarterly
• Computer based General Training Module
• 24 Position specific modules

Continuing Training
• Annual
• Performance and Team based
• Classroom and specific skills refresher
• Topics from Drill and Exercise performance issues

Specialized Training
• Controller/Evaluator
• Field Monitoring
• Core Damage
• Dose Assessment
• Severe Accident Management
Onsite Emergency Response Facilities

Main Control Room (MCR)
- Initially responsible for the Identification and Classification of Emergency.
- Placing the plant in a stable condition

Operation Support Center (OSC)
- Activated at an Alert or Higher
- Provides support teams to mitigate emergency consequences

Technical Support Center (TSC)
- Activated at an Alert or Higher
- Provides Technical Support for the Main Control Room
- Provides Onsite Radiological Support

Emergency Operations Facility (EOF)
- Activated at a Site Area Emergency or General Emergency
- Provides Protective Action Recommendations to Offsite stakeholders

Environmental Laboratory
- Analyze environmental samples during normal and post accident operations.
Emergency Response Facilities

Barakah Nuclear (MCR, TSC and OSC)
Emergency Response Center At Ruwais
Main Control Room (Yellow)
Technical Support Center (Blue)

Auxiliary Building EL-156’
2019 Drill and Exercise Schedule

6 Drills conducted between February and July

Dress Rehearsal drill conducted on 1st of October 2019

FANR Exercise conducted on 5th of November 2019
Drill and Exercise Performance Measurement Risk Significant Planning Standards

- Drill and Exercise performance is based on cornerstone objectives known as Risk Significant Planning Standards (RSPS).
- During the development of the Emergency Preparedness cornerstone, the most risk-significant objectives were identified as being distinct from other drill and exercise objectives.
- RSPS were developed by subject matter experts, regulators and the public. The Barakah Nuclear Energy Plant planning standards are below and are align with industry standards:
  
  • Classification – Can the event be classified correctly?
  • Notification – Can the Offsite Stakeholders be notified promptly?
  • Dose Assessment – Can the magnitude of a radiological release be defined?
  • Protective Action Recommendations – Can the public be adequately protected from the event?
**Definition of Each Classification Level and Actions Taken in Each One**

**Notification of Unusual Event (NOUE)**
An event that is in progress or has occurred, which indicates a potential degradation of the level of safety of the plant or indicates a security threat to facility protection. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

**Alert**
An event involving an unknown or significant decrease in the level of protection for the public or onsite personnel. When an Alert is declared, the state of readiness of the onsite and offsite emergency response organizations is increased and additional assessments are made.

**Site Area Emergency (SAE)**
An event resulting in a major decrease in the level of protection for the public or onsite personnel.

**General Emergency (GE)**
An event resulting in an actual release, or substantial probability of a release, requiring implementation of Urgent Protective Actions offsite.

**In emergency cases (Notification of Unusual Event and Alert)**
*Offsite authorities are not required to respond.* Barakah will augment on-shift resources, activate and staff the Technical Support Center (TSC) and the Operations Support Center (OSC), and place the EOF staff and other emergency response personnel in a “standby” status, as appropriate to the situation at hand.

**In emergency cases (SAE and GE)**
*Offsite authorities will augment their resources, mobilize all personnel who would assist in an evacuation of the general public from the affected areas, initiate the public warning process, and activate and staff the EOC.*
Protective Action Recommandations (PARs) & Protective Action Decisions (PADs)

(1) Classification
The Emergency Response Organization (ERO) classify the emergency case using the Emergency Action Levels used in BNPP.

(2) Identifying Affected Groups
The ERO identify the affected groups using the BARAM/RASCAL software.

(3) Issuing PARs
Using RASCAL/BARAM initial results, the ERO identifies the best protective actions needed and send their recommendations to the Incident Commander.

(4) Issuing PADs
The Emergency Director is responsible of issuing the Onsite PADs.
The Incident Commander is responsible of issuing the Offsite PADs.
Offsite Emergency Response Organization

**Reception Center**
Activated in Site Area Emergency or above.
Deals with the decontamination, accountability and temporary care of the evacuated personal.

**Ruwais and Madinat Zayed Hospitals**
Activated in Site Area Emergency or above.
Deals with radiological contamination injuries.

**Notification Point**
Receives notifications from BNPP, then notify the Offsite responding entities after taking the Incident Commander confirmation.

**Emergency Response Center (EOC)**
Activated at Site Area Emergency (SAE) and/or General Emergency.
Implements Protective Actions Decisions for the Public.

**NOC Media Cell**
Activated in Site Area Emergency or above.
Deals with the Media, issues press releases, arrangement of press conferences.
AT SITE Moment

Excellence

A personal commitment to continuous improvement significantly contributes to our overall success because it forces each of us to constantly be thinking about how we can do things better.

To ensure the continuous improvement, you have to do the following:

1. Select the appropriate process for improvement.
2. Evaluate Process
3. Analyze: Identify and verify the root cause(s).
4. Take Action: Plan and implement actions that correct the root cause(s).
5. Study Results: Confirm the actions taken to achieve the target.
6. Standardize Solution: Ensure the improved level of performance is maintained.
7. Plan for Future: Plan what is to be done with any remaining problems
8. Evaluate the team’s effectiveness Set a target for improvement
Any Questions?