

Barakah Unit1 Start-up Key Messages August 2020

The first reactor of the Barakah Nuclear Energy Plant has been successfully started up. This will be announced to the media on 01 August 2020.

Strategic Messages:

1. Start-up marks the point at which nuclear fission occurs, as part of the process towards generating clean electricity.
2. This is a historic milestone for the Nation, as ENEC works to deliver on the vision set by the Leadership in 2008 to deliver a new form of clean, abundant electricity for the Nation.
3. Nawah's qualified and certified team of UAE National and international expert nuclear operators will slowly increase the nuclear fission and start to produce electricity, prior to connecting to the UAE grid.
4. Commending the UAE's Leadership and the highly efficient Emirati cadres working on this project, alongside the achievements of team members of the international workforce.

Sub-messages:

- **Barakah Nuclear Energy Plant is a historic project that enhances the UAE's leading role in the global clean energy transition**
 - o The UAE is the first in the Arab World and 33rd internationally to produce clean electricity from nuclear energy.
 - o Emirates Nuclear Energy Corporation is proud to have developed the UAE Peaceful Nuclear Energy Program for the United Arab Emirates according to the highest international standards of safety, security, transparency and nuclear non-proliferation.
 - o The Barakah plant, when fully operational, will generate 25% of the nation's electricity, while preventing the release of 21 million tons of carbon emissions annually, which is equivalent to removing 3.2 million cars off the road.
- **Joint collaboration of Emirati and international expertise in achieving these accomplishments during this crucial phase.**
 - o UAE Nationals make up more than 60% of the total 3,000-strong workforce. Females account for 20%, which is considered to be one of the highest percentages in this sector on an international level.
 - o The project has created high value careers throughout the construction and operation of the Barakah Nuclear Energy Plant.

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- o In October 2019, and January 2020: 72 Senior Reactor Operators (SROs) and Reactor Operators (ROs) were certified by FANR of which 30 are UAE Nationals. SROs and ROs complete a training program that lasts up to 7 years, developed by ENEC and Nawah, according to FANR's regulations. They are certified and licensed by FANR.
- o November 2019: 31 Field operators engineers were qualified for initial fuel load, 28 of them are UAE Nationals. Their responsibilities include handling and monitoring the fuel and monitoring any fire hazards.
- **Highlight the partnership of UAE and South Korea in peaceful nuclear energy sector**
 - o ENEC awarded the Prime Contract for the construction of the Barakah plant to Korea Electric Power Corporation (KEPCO) in 2009. The contract is worth \$20 billion.
 - o KEPCO have over 40 years of experience and expertise in constructing and operating nuclear energy plants.
 - o The APR1400 technology used at Barakah is the same as the Shin Kori 3&4 units – the reference plant Barakah is based on, which started operating in 2016.
 - o In 2016, ENEC and KEPCO signed a joint venture agreement to ensure the long-term sustainability of the UAE Peaceful Nuclear Energy Program. Through the JV, ENEC owns 82% of Nawah Energy Company (the operating and maintenance subsidiary of the Barakah plant) and 82% of Barakah One Company (ENEC's financial and commercial subsidiary), with KEPCO owning an 18% stake in each company.
 - o In 2019, The Barakah One Company (ENEC's financial and commercial subsidiary) signed an agreement with KEPCO to evaluate opportunities to for exporting nuclear technology to other countries.
- **Barakah Nuclear Energy Plant is not just a power plant, but a social, educational and economic stimulus as well.**
 - o Since its development, the UAE Program, through the development of ENEC and the Federal Authority for Nuclear Regulation (FANR) has contributed to the UAE's capabilities of working in several new fields such as nuclear medicine, space program and nuclear engineering.

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- **Barakah Nuclear Energy Plant is an example of the country's capabilities of developing a safe large-scale international project despite the current COVID-19 pandemic.**
- **The reactor of the first unit has been successfully started up, which is a crucial step in producing clean electricity using nuclear energy in the United Arab Emirates for the first time in its history.**
 - Unit 2 construction is complete and undergoing operational readiness preparations. The overall construction completion of the four plants exceeded 94% as of May 2020.
- **The four units will meet up to 25% of the nation's electricity demands through the production of 5,600 megawatts of emissions-free baseload electricity.**
 - Nuclear energy technology:
 - Uranium is mined, then processed and made into small pellets the size of an adult fingernail
 - Each uranium pellet contains the same amount of energy as:
 - One ton of coal
 - 474 liters of oil
 - 481 cubic meters of natural gas
 - One Uranium pellet can power an Emirati home 24 hours a day for 4 months
 - The APR-1400 reactor design uses 241 fuel assemblies at a time.
- **Since the inception of the UAE Peaceful Nuclear Energy Program, ENEC and Nawah have developed a wide range of educational opportunities for students in UAE universities.**
 - To date, over 500 UAE Nationals have benefited from the Energy Pioneers Program (380 students have graduated and 125 students are currently in the program)
 - In November 2019 the Emirates Nuclear Technology Center was launched at Khalifa University in Abu Dhabi, which supports the long-term sustainability of the UAE Peaceful Nuclear Energy Program by creating a dedicated innovation hub for peaceful nuclear technologies.
 - Khalifa University now has a nuclear engineering department and offers degrees in: Undergraduate in Nuclear Engineering, MS.c. in Nuclear Engineering, Doctor of Philosophy of Engineering – Nuclear Engineering.

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- Abu Dhabi Polytechnic has established the Advanced Energy Engineering Technology department and offers a Higher Diploma in Nuclear Technology.
- In 2016, ENEC sponsored a cutting-edge virtual classroom at Khalifa University (KU) to enable students to work at Barakah and continue their studies.
- ENEC's student outreach program has provided sessions in more than 60 schools and universities attended by more than 2,000 students.
- **The Barakah Nuclear Energy Plant has contributed to enhancing safety procedures and the highest international standards in the country**
 - In January 2020, the World Association of Nuclear Operators (WANO) confirmed that Unit 1 of the Barakah plant had cleared the Pre-Start Up Review (PSUR), and was ready to start up.
 - In February 2020, FANR awarded Nawah the Operating License for Unit 1.
 - In March 2020, the fuel load for unit 1 was completed and the process verified by the International Atomic Energy Agency (IAEA)
 - ENEC has implemented a number of safety layers which would prevent anything similar to previous well-known accidents including:
 - The modern plant design with the latest safety systems. The APR1400 reactor design is certified by the US-based Nuclear Regulatory Commission
 - Operator training and robust policies and procedures that embed safety as the overriding priority
 - Embedding of a healthy nuclear safety culture
 - Independent national and international regulatory and supervision organizations ensuring that the plant and its staff maintain the highest industry standards of safety and quality
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