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Construction monitoring over Barakah nuclear power plant

The Barakah nuclear power plant is the United Arab Emirates's first nuclear power station. It consists of four APR-1400 nuclear reactors. Total capacity is 5,600 MW which is intended to supply up to 25% of UAE's energy needs. The site is in the Gharbiya region of Abu Dhabi.

Figure 1. KOMPSAT-3(Pink) and KOMPSAT-3A(Gray) images used for the study

This study contains three images of the Barakah nuclear power plant captured by **KOMPSAT-3 and 3A** from the year of 2015 to 2020. Those images are used in this study to monitor construction process over time.

Figure 2. Full-size image taken respectively in 2015(left, KOMPSAT-3) and 2020(right, KOMPSAT-3A)

Emirates Nuclear Energy Corporation (was selected to build four APR-1400 nuclear reactors consecutively. ENEC) awarded a coalition led by Korea Electric Power Corporation (KEPCO) a $20 billion bid to construct the first nuclear power plant in the UAE in December 2009.

Construction of the first unit started on 18 July 2012. In the following year of 2013 on May, the second unit was begun to be built and expected to take five years but it actually took less than that. Moreover, construction of unit 3 was held in September 2014. Finally, unit 4 started construction in September 2015.

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PRODUCT USED

- KOMPSAT-3
  - EO Satellite
  - 0.7m resolution
  - Level 1O
- KOMPSAT-3A
  - EO Satellite
  - 0.55m resolution
  - Level 1O

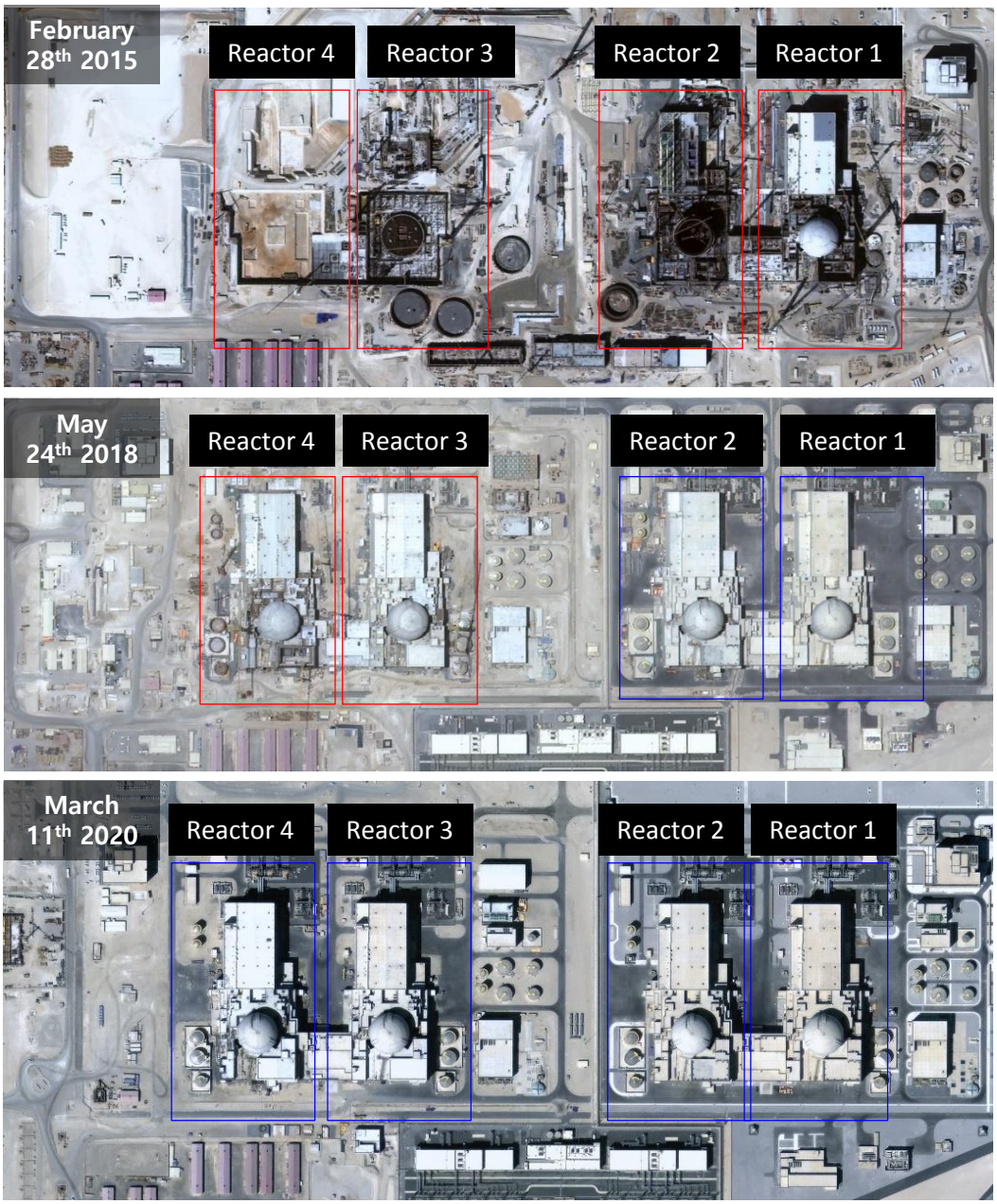

Figure 3. Time series images over the Barakah nuclear power plant
(Top to bottom : KOMPSAT-3, KOMPSAT-3, KOMPSAT-3A images)

From the top, the images were taken on February 28th 2015, May 24th 2018, and March 11th, 2020. On February 28th 2015, Reactor 1, 2, 3 were under construction while the reactor 4 was undergoing ground preparation for building the structure. On May 24th 2018, two units were completed, and the other two were going through construction for finalizing the project. Finally, on March 11th, 2020, all four units were completed successfully.

Conclusion

In conclusion, it is proved that KOMPSAT-3 and KOMPSAT-3A satellite imagery with respectively 70cm and 55cm resolution is useful for construction monitoring. In particular, it is effective to detect construction progress over some period of time when construction in large area is being held.

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