

Monitoring Activity at Yongbyon Nuclear Site

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Recent commercial satellite imagery shows that North Korea's 5 megawatt-electric (MWe) reactor at the Yongbyon nuclear site appears operational. There have not been recent outward signs of the expansion of the centrifuge facility, suggesting that construction of the building is complete and that North Korea could now be installing equipment or even centrifuges inside.

5 MWe Reactor and Light Water Reactor (LWR)

Since August 2013, commercial satellite imagery has shown that water is being discharged near the 5 MWe Yongbyon reactor. This outflow water is being discharged into the river through a pipeline buried east of the reactor. Imagery dated April 7, 2014 shows that water was being discharged, suggesting that the 5 MWe reactor was operating on this date (see figure 1).

This water discharge is most likely from a secondary cooling system used to cool the carbon dioxide gas from the 5 MWe reactor core. ISIS assesses that the 5 MWe reactor's secondary cooling system may be receiving water through a very long piping system connected to a water intake house 1.5 km north of the reactor. This pump house underwent significant changes in October 2010 and in October 2012 and is connected to the 5 MWe reactor area by what looks to be a buried pipeline (see figure 1) that runs parallel to a road. Several circular objects appear along the piping line, which could be used to further direct the water flow.

The presence of the inflow piping and the discharge of water from the outflow piping system signify testing or on-going operation of the 5 MWe reactor, where the water would discharge excess heat produced in the reactor. In recent imagery, there is no sign of steam being emitted from the reactor's turbine building. Steam emission would suggest that the reactor is producing electricity and regular steam emission would indicate that the reactor is operating more regularly. However, the lack of steam does not exclude regular operation.

Centrifuge Plant

The gas centrifuge enrichment plant at Yongbyon is believed to be producing low enriched uranium (LEU) fuel for the light water reactor (LWR) or for further enrichment to weapon-grade uranium at Yongbyon or elsewhere. In August 2013, ISIS noted that North Korea had been [expanding](#) its gas centrifuge plant at Yongbyon, therefore potentially doubling its enrichment capacity. In a December 2013 [ISIS Imagery Brief](#), ISIS highlighted that North Korea had renovated an additional section of the old roof in the original building that appears to be part of the centrifuge plant.

Recent imagery from April 7, 2014 (figure 2) has not shown any significant alterations to the outside of the gas centrifuge enrichment building. This could signify that the expansion is outwardly finished and that North Korea could now be concentrating on installing equipment and even centrifuges inside the expanded building.

The image shows a number of new objects that appear stacked near the enrichment building and several train cars on nearby rail tracks. These objects could not be identified or linked to the centrifuge facility. The objects

appear too long to be uranium hexafluoride (UF₆) cylinders. Each is about 10 meters in length, which is far longer than standard UF₆ cylinders.

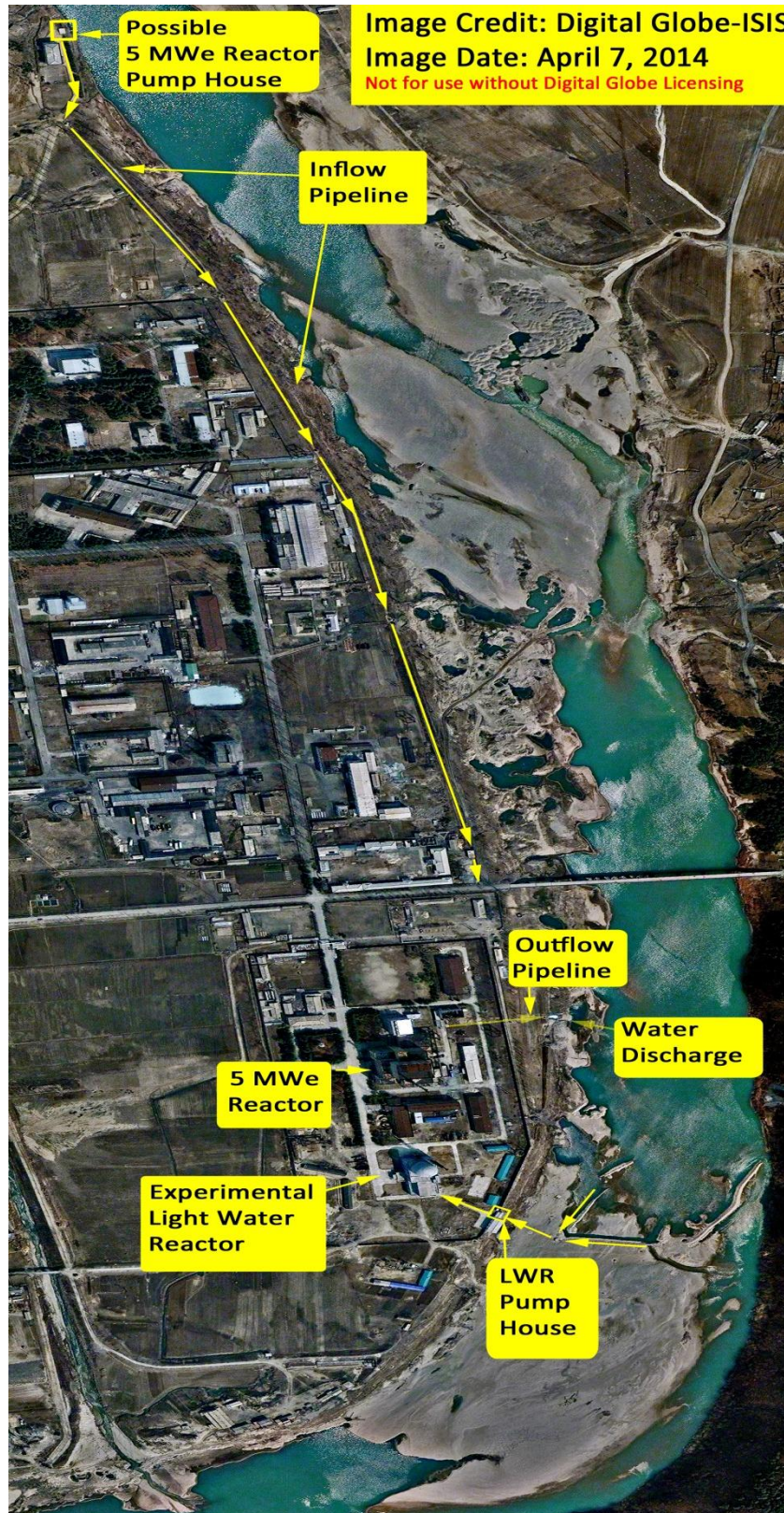


Figure 1. Digital Globe imagery showing North Korea's Yongbyon 5 megawatt-electric (MWe) and experimental light water reactors, and the respective water inflow and outflow systems of the 5MWe reactor on April 7, 2014.

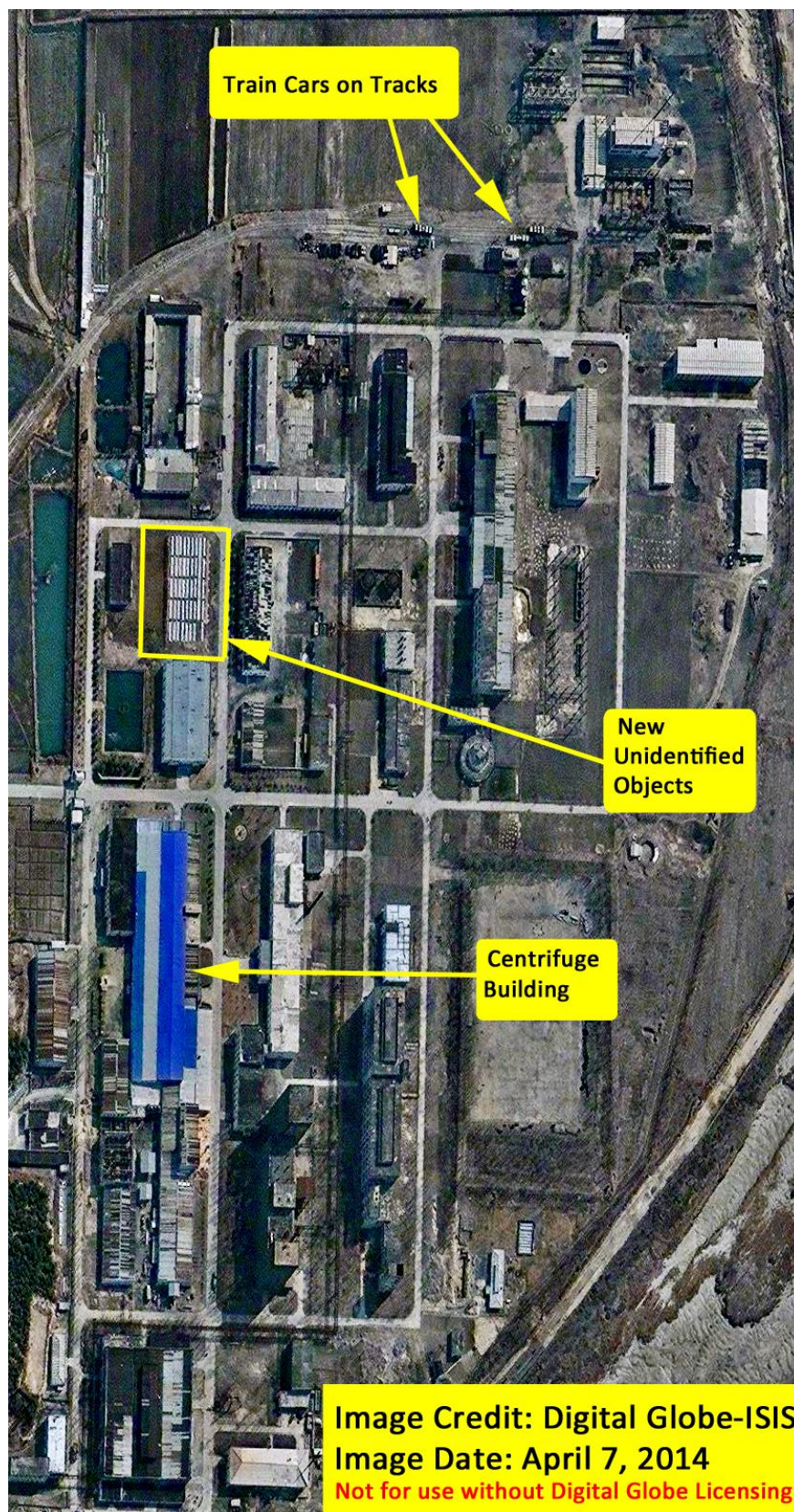


Figure 2. Digital Globe Imagery showing the status of North Korea's Yongbyon Fuel Fabrication Complex and Uranium Centrifuge Plant (bright blue roofed building) on April 7, 2014.