Institute for Science and International Security

ISIS IMAGERY BRIEF

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Steam Venting from Building Adjacent to 5MWe Reactor: Likely Related to Reactor Restart

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ISIS was approached over the weekend by the Kyodo News regarding reports of steam rising from the Yongbyon 5 megawatt-electric (MWe) graphite moderated reactor. The reactor was disabled in 2007 and its cooling tower was demolished but recent statements by the North Korean government indicated that it planned on restarting the reactor in the near future. The organization 38North.org has also been tracking what appeared to be construction meant to connect the 5MWe reactor to the pump house originally built to supply water for the cooling system of the Experimental Light Water Reactor currently in the final stages of construction. The water provided by the pump house would supply the secondary cooling system of the 5MWe reactor enabling it to resume operation and the further production of plutonium.

The latest DigitalGlobe satellite imagery from August 31, 2013 shows two columns of steam rising from a building adjacent to the 5MWe reactor (figure 1). The venting of steam is most likely connected to the operation of the reactor. A close up of the source building of the steam shows what appear to be two vents on the roof that would act as the release points for the steam generated by the reactor's operation (figure 2).

The August 31 imagery also shows that the light water reactor (LWR) appears to be externally complete. However, work is likely still ongoing inside the reactor building. The LWR is estimated to start up in the second half of 2013 or first half of 2014. North Korea has also recently expanded its gas centrifuge enrichment plant which is believed to be producing low enriched uranium fuel for the LWR.

The restart of the 5MWe reactor and the expansion of the Yongbyon fuel fabrication facility housing North Korea's known enrichment facility provide North Korea with the ability to expand its stocks of plutonium as well as produce more highly enriched uranium for nuclear weapons. Any resumption of negotiations should include a halt to both facilities, and a commitment that the LWR would be used for peaceful purposes only. Given that North Korea will likely need 2-3 years before it discharges irradiated fuel containing plutonium and another 6-12 months to separate the plutonium, there remains time to negotiate a shutdown of the reactor before North Korea can use any of this new plutonium in nuclear weapons. If a shutdown is achieved in the next six months, the reactor would have produced very little plutonium.

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Figure 1. DigitalGlobe imagery showing the venting of steam from a building adjacent to the 5MWe reactor indicating that the reactor might have restarted operation.

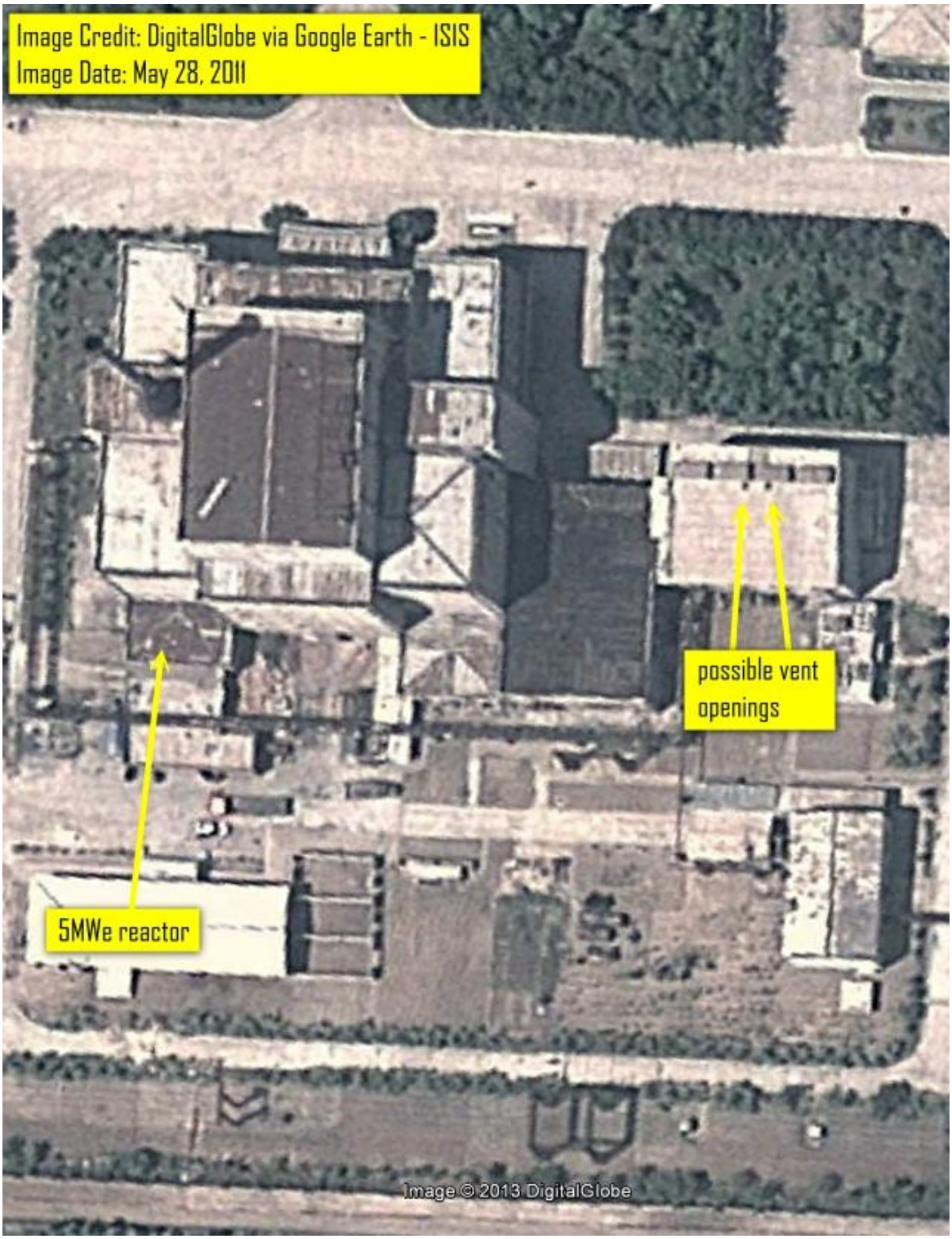

Figure 2. Close up Google Earth image from May 28, 2011 of the 5MWe reactor the adjacent building with what appear to be two vent openings on its roof. The vent openings are consistent with the columns of steam seen rising in the August 31, 2013 imagery.