

## **Pakistan Appears to be Building a Third Plutonium Production Reactor at Khushab Nuclear Site**

**Time for a universal, verified halt to production of plutonium and highly enriched uranium for nuclear weapons**

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Commercial satellite imagery from DigitalGlobe taken on June 3, 2007 indicates that Pakistan appears to be building a third plutonium production reactor at the Khushab nuclear site (see Figure 1). On July 24, 2006, ISIS published imagery revealing the construction of a [second heavy water reactor at Khushab](#). The second heavy water reactor, which Pakistan began building between 2000 and 2002, is still under construction in the June 3, 2007 imagery. When operational, this reactor could be as large as several hundred megawatts thermal, notwithstanding claims by Pakistan of its intended initial power capacity.

The third reactor appears to be a replica of the second heavy water reactor and is located a few hundred meters to the north, though construction is progressing much more quickly than the second. A GeoEye image of the same area in Khushab taken in August of 2006 shows only a faint dirt foundation and no structures (see Figure 2). Almost all of the third reactor construction visible in the June 3, 2007 image has taken place in the last 10 months.

The similarities between the second and third reactor construction projects indicate that the power of the third plutonium production reactor is likely to be similar to that of the second reactor (see Figures 1, 4, 5 and 6). The first Khushab reactor went critical in 1998 and looks significantly different from the second and third reactors (see Figure 3). The facilities at this site are not safeguarded by the IAEA and support Pakistan's nuclear weapons program.

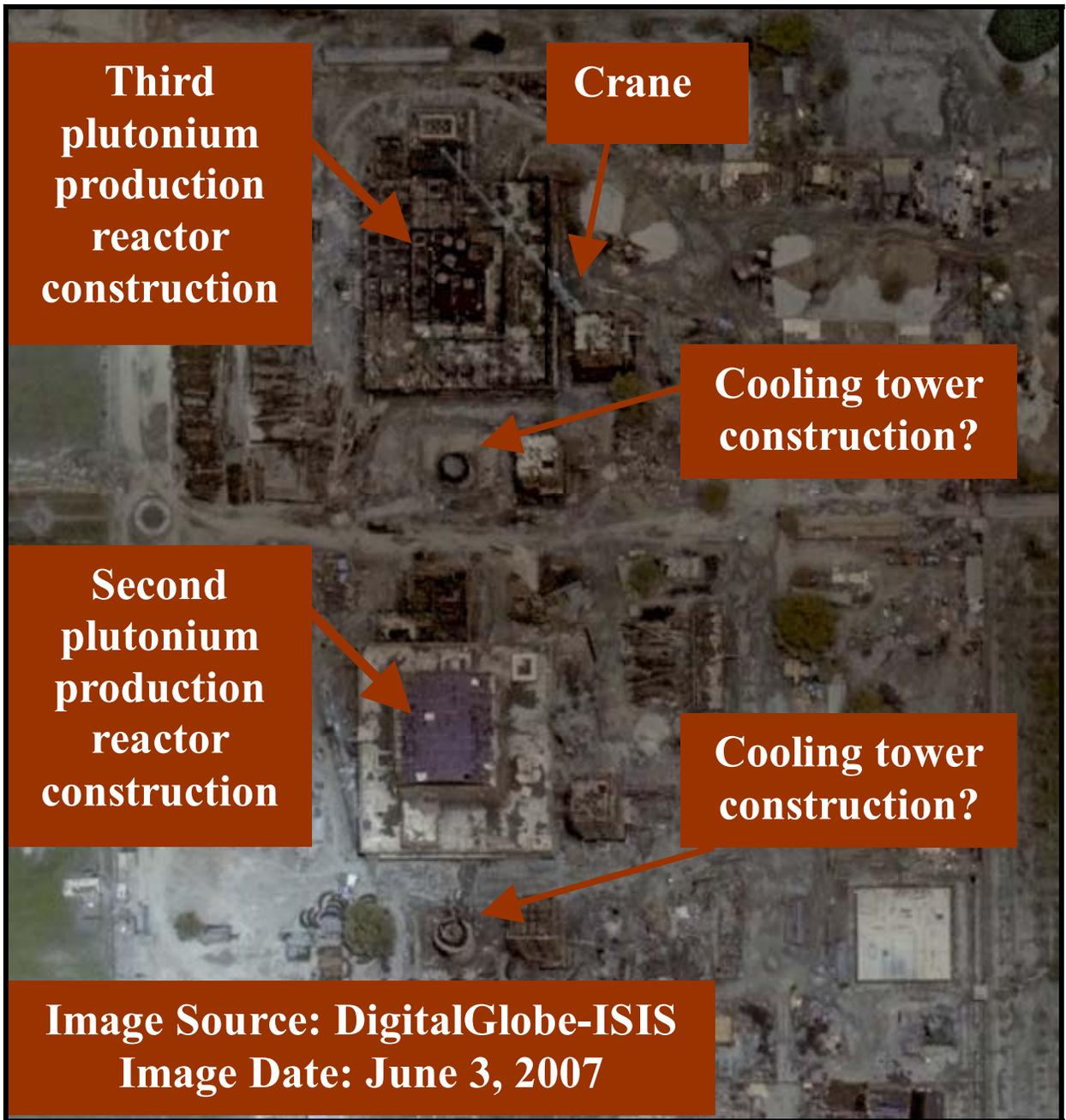
ISIS reported in January 18, 2007 the resumption of construction of what appears to be a [plutonium separation facility at Chashma](#), a facility approximately 80 km west of Khushab. This reprocessing facility, which would be Pakistan's second and is also unsafeguarded, is likely related to the construction of the two additional reactors at Khushab. When the reactors come on line, Pakistan's demand for reprocessing capacity would increase significantly. The expanded construction at Khushab, and apparent resumption of activity at the Chashma plutonium separation plant, all occurring within the last six years, imply that Pakistan's government has made a decision to increase significantly its production of plutonium for nuclear weapons.

## Why More Plutonium?

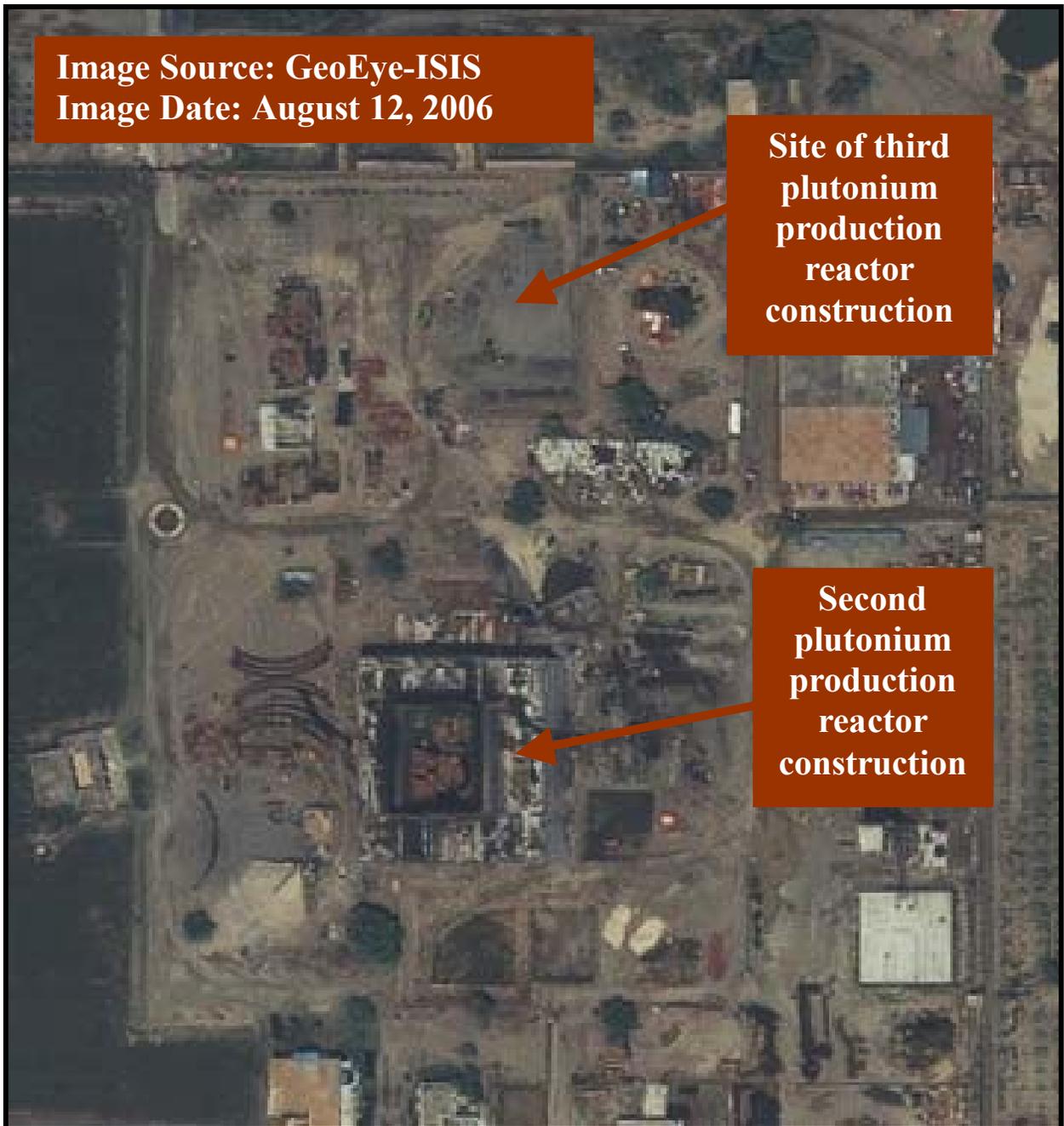
Pakistan may have concluded that it needs the plutonium to improve the quality of its nuclear arsenal and build a new generation of lighter, more powerful weapons. Plutonium-based weapons can have more explosive yield in smaller, lighter packages than weapons based on highly enriched uranium, which is currently Pakistan's principal nuclear explosive material and produced in abundance at its gas centrifuge plants. For example, Pakistan may want warheads small enough to fit on cruise missiles it is currently developing. It also may want larger yield (50-100 kiloton) fission weapons that can cause far more damage to Indian cities than its current relatively low-yield weapons. In addition, plutonium-based fission weapons would enable Pakistan to build deliverable thermonuclear weapons. Although these new types of weapons would enable Pakistan to build a nuclear arsenal more threatening to India and thus one perceived to better deter it, their development would in fact create greater instability in the region and eventually less security for Pakistan.

The recent activity at Khushab and Chashma should be viewed as a sign of an accelerated nuclear arms race between India and Pakistan. ISIS reported on January 18, 2007 India's intensified efforts [to increase its uranium enrichment capability](#) at the Rare Materials Plant (RMP), an effort that relies on illicit international smuggling to obtain certain dual-use items for the plant and has through carelessness leaked sensitive centrifuge design information. Recent debate on the proposed U.S.-India peaceful nuclear agreement has highlighted India's desire to maintain a massive plutonium production capability for weapons that can add to an already large stock of weapons plutonium.

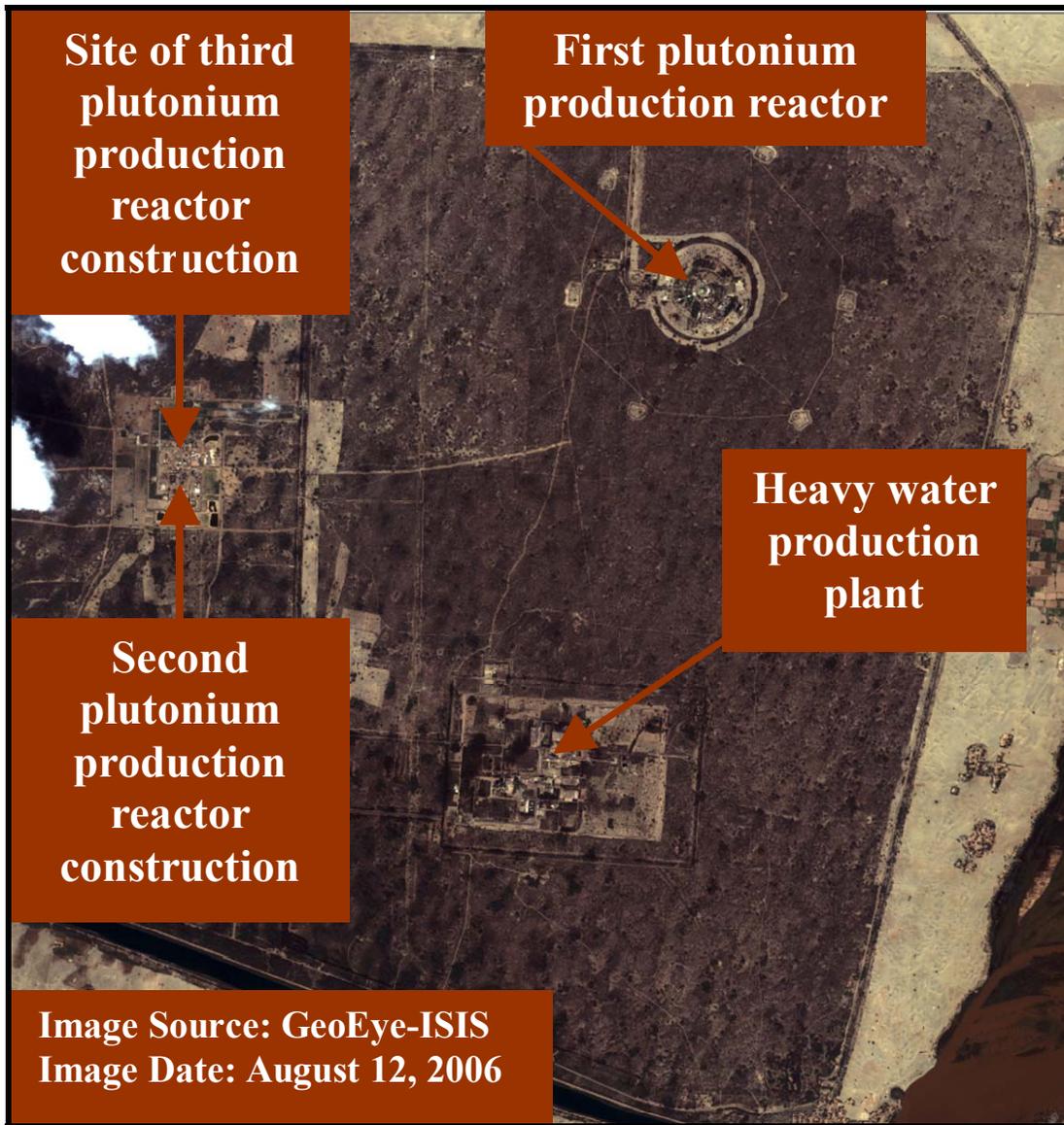
Both Pakistan and India appear on the verge of greatly expanding their production of nuclear explosive materials and nuclear weapons, including more powerful weapons. A negotiated agreement that results in a verified, universal halt to the production of plutonium and highly enriched uranium for nuclear weapons should be a priority for any country concerned about the dangers posed by growing stocks of fissile materials, particularly in states with excessive, dangerous nuclear arsenals. Rather, the Bush Administration continues to minimize the risks of the Indian and Pakistani arsenals as it seeks to conclude an unprecedented nuclear cooperation agreement with India and maintain the war on terror in Pakistan and Afghanistan. Such a shortsighted approach to nonproliferation policy has deeply troubling consequences, not the least of which is a dangerous buildup of plutonium and highly enriched uranium stocks on the subcontinent.



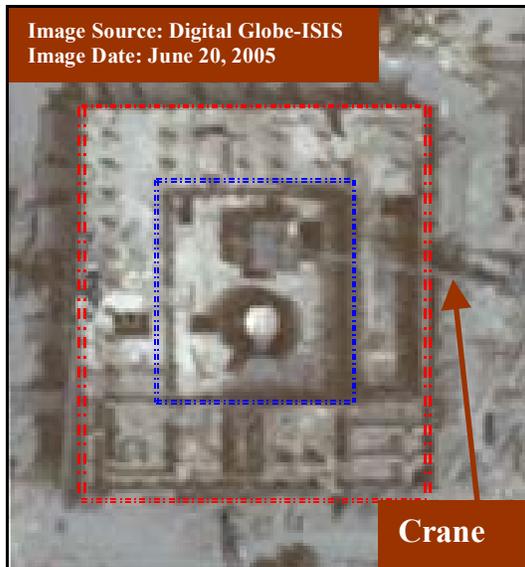
**Figure 1. Construction of a third plutonium production reactor can be seen a few hundred meters to the north of the second reactor.**



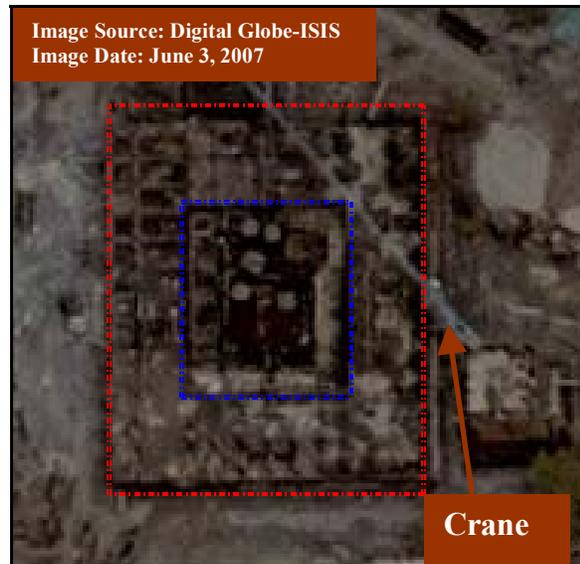
**Figure 2. This August 12, 2006 image shows a faint dirt outline of a foundation, but there are no structures.**



**Figure 3. An overview of the Khushab nuclear site on August 12, 2006.**



**Figure 4.**  
**Second Khushab reactor**  
**on June 20, 2005.**



**Figure 5.**  
**Third Khushab reactor**  
**on June 3, 2007.**



**Figure 6. Second Khushab reactor**  
**on April 19, 2004.**

Comparing images of the second Khushab reactor at different stages of construction, found in figures 4 and 6, to an image of the facility in figure 5 shows a striking similarity in terms of exterior shape and conformity of the inner structure. This conformity can be seen, despite the many tarps covering the construction site in figure 6. Additional features suggesting that the buildings are replicas are the structures adjacent to right bottom corner of each facility (see figure 1). The round objects in the image in Figure 5 are difficult to discern, but they could be storage tanks located in a basement associated with a heavy water reactor.