

## CHERNOBYL INSTABLE

A new town that did not work: the industrial settlement just upstream from Chernobyl. The reason for failure: poor siting.

To gain access to large volumes of water, a massive reactor complex—with its own requirements for secure foundations—was built on a shallow landfill on top of a river bed, in the middle of meanders. Downstream and alongside, a giant cavity was excavated from the mud of the river bed so that a water supply for the steam driving the turbines could be recycled. This seemed to be a clever arrangement, for the complex could be isolated among marshlands far from any prominent river, far from view. Forgotten was the fact, plain to any child, that mud in a river bed will tend to ooze downstream, particularly during spring floods, and that anything siting on a tongue of mud just upstream from a giant excavation can expect to be moved. As French and German nuclear authorities have confirmed to us, quietly, this happened. A shifting foundation led to dislocations of external water supply, hence to an unexpected shutdown of the reactor—during which 'the operators on site' made a mistake.

These photographs, from a French satellite passing over the site several weeks after the accident, then four months later, show evidence of the cause. From left to right, along the axis of the Pripyat River, with meanders about equidistant on both sides, the later image shows massive new plugs of concrete. The diversion itself is caused by concrete-embankments. Then, in a line, appears: (1) the broad flat concrete square, holding rigid the waters a meander that—unlike others—forms (2) a curious bulge; just downstream, at (3), a flat hollow once filled with water is dried and later plugged in with concrete; (4) downstream, parallel to the lake divider, more concrete emplacements; at the downhill side of the reservoir, where pressure to dislocate might be greatest, appears (5) a new, 200-meter long concrete buttress; and further down, by Chernobyl itself, (6) appears another concrete emplacement. All changes align with the Pripyat, as revealed in larger satellite views; the alignment passes directly through the fatal one reactor, No. 4.

A clue of the problem appears as the dark tracery at right angle to the river axis from No. 4. With the first public Chernobyl imagery, this tracery was attributed to smoke. But evidence from before and here, much later, shows a continuing presence. The dark line appears more as a fissure, or upwelling of moisture, in the landfill—a point of dislocation perpendicular to the line of movement.

The disaster was architectural. Given that the entombed reactor will be hot for a hundred years, and that the concrete plugs into the river channel are not expected to last nearly that long, more drama may yet ensue—not just for the Ukraine, but for most of Europe.

Kenzo Tange once designed a Tokyo Bay megastructural city that any satellite would reveal, and any Doxiadis-scale thinker would undertake. But the buildings envisioned were to be set over water, on artificial ground, in a region vulnerable to earthquakes and tidal waves. How stable could such giant structures be? How stable, by comparison, would be the structures evident from satellites to lie on faultlines, like Indian Point nuclear power station? With satellites the crucial site and foundation research, preliminary to any major project, can be economic—and customary.

Peter Fend