Energy Insider by William Engdahl

Soviet Union far ahead in PNE use to develop energy

In early December the Dow-Jones wire services carried an item taken from the reputable French *Bulletin de l'Industrie Petrolière.* The wire story sent jitters through the New York Stock Exchange, with Exxon dropping two points and Standard Oil of California, four.

The French article which sparked the short-lived excitement was based on an earlier report from a Malmö, Sweden research firm, Petrostudies. According to that report the Soviets have discovered an oil field in Western Siberia of an estimated 619 billion tons, approximately 4.5 trillion barrels of oil. If accurate, this would make it the largest field in world history and more than twice current estimated total world recoverable oil reserves.

Within hours, the Petrostudies report was denied or dismissed as "ridiculous" by authorities from the U.S. Geological Survey to the Soviet Academy of Sciences. But, aside from the sensational headlines, there may be a far more significant story going largely unnoticed in the United States.

Soviet PNE program

In the process of evaluating the first report, I spoke to a leading geologist with the U.S. Geological Survey in Reston, Virginia.

Jack Rachlin, who specializes in Soviet geology, pooh-poohed the Petrostudies report as being apparently unfounded, but directed my attention to a paper which he and another colleague presented earlier this year. Rachlin's work was the subject of a little-noticed summary article in the June 16, 1980 *Oil & Gas Journal* titled, "Salym: potential West Siberian oil giant."

What is somewhat buried in the *Oil & Gas Journal* report, but is explicit in the original U.S.G.S. paper, is their evaluation that the Soviets have been deploying what are referred to as underground Peaceful Nuclear Explosions (PNEs) in the vicinity of the Salym oil field of Western Siberia as a part of an ongoing series of experiments on petroleum development: "A seismic event of October 4, 1979, east of the Ural Mountains, was described by the U.S. Department of Energy as an underground nuclear explosion. The location of this event by the U.S. Geological Survey places it in the oil-rich Middle Ob region of West Siberia in the vicinity of the Salym oil field"* (see map).

If this is accurate as our best informed geological estimates indicate, what does this mean? Since the earliest days of the Eisenhower Atoms for Peace effort in the 1950s, the peaceful application of nuclear explosions has been the subject of immense promise for accomplishing tasks that would be prohibitively costly by conventional means. The United States' efforts in this direction were dubbed "Operation Plowshare."

I spoke with a leading authority at one of the U.S. national scientific laboratories on the relative state of the art between the U.S. and U.S.S.R. in peaceful nuclear applications. His statement is sobering: "There is no question in my mind," he stated, "the Soviets are aggressively pursuing PNEs in a variety of applications. There is no question it's true that they have a tremendous lead."

One reason for their lead is the fact that since approximately 1972, the United States, "for political reasons," has essentially halted all active PNE testing, despite the fact that they are known not to produce any significant increase in radioactivity because of the physics of underground detonation. Current Defense Secretary Harold Brown, in cooperation with the Carter State Department, has been instrumental in effectively aborting valid U.S. efforts under the false rubric of nonproliferation.

Oil recovery

How could such an underground nuclear explosion aid in oil recovery? As Rachlin told me, as early as 1967, two years after substantial oil finds were discovered in

that region of Western Siberia, Soviet geologist A. E. Kontorovich calculated that "the liquid fractions of petroleum of the Upper Jurassic bituminous shales of West Siberia total 2 trillion tons." This translates into more than 14 trillion barrels of oil potential, a considerable increase even from the enormous 4.5 trillion tons calculated by the Petrostudies report.

The significant question, as Rachlin confirmed, is how much of this potential oil wealth is economically recoverable.

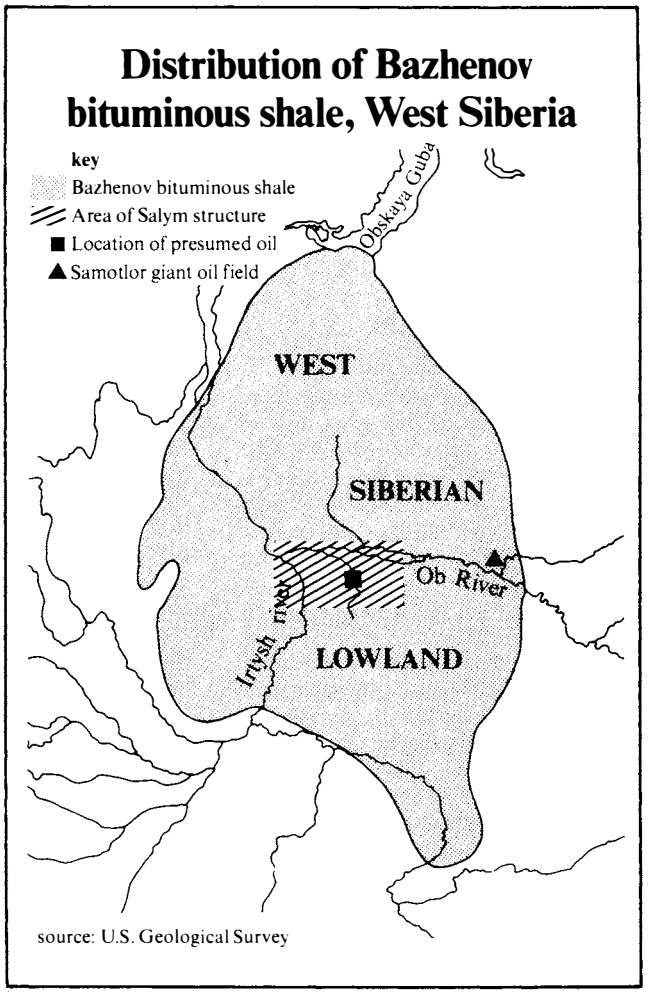
It is, in effect, locked into tight bituminous shale rock at a depth of approximately 8,400 feet. "The explosion at the Salym field," Rachlin states, "may have been an experiment to stimulate production by extensive fracturing of the tight bituminous shales. Such an explosion could in effect produce a rubble chimney and fracture envelope tens of meters in radius. This fracturing could raise production rates, make larger or additional areas of the Bazhenov Formation susceptible to production and decrease exploitation costs." In short, there is overwhelming evidence, corroborated by some of our best scientific experts here, that the U.S.S.R. is applying PNEs to tap this huge oil potential in Western Siberia.

PNE technology

The fact that the United States presently has all but halted work in this peaceful application of nuclear force is a scandal of enormous dimensions. In a 1975 review, Milo Nordyke of Lawrence Livermore Laboratory, considered the top U.S. expert on the Soviet PNE program, reviewed Soviet data on the peaceful uses of nuclear explosions for the *Annals of Nuclear Energy*. His material was drawn from public presentations to meetings of the International Atomic Energy Agency and various scientific publications. Nordyke noted that even five years ago or earlier, the Soviets were publicly reporting results of experimental explosions designed, among other things, for applications in the petroleum, gas, minerals industries; in water resource development including creation of crater-lip dams for water storage reservoirs; and creation of a canal linking the Pechora and Kama rivers to the Volga River and the Caspian Sea.

In the petroleum field, Nordyke cites reported experiments involving underground nuclear detonation to bring runaway gas wells under control and oil field stimulation by breaking underlying barriers so water will force oil to top. Other projects have been concerned with creation of underground storage of oil or gas in salt domes.

Commenting on these developments in 1975, Nordyke noted that "the Soviet PNE program appears to be very broadly used to assist in the development of their natural resources with a number of technical areas being developed simultaneously."



In this context, then, the evaluation of the U.S. Geological Survey that the Oct. 4, 1979 seismic event in the proximity of the Salym oil fields "suggest another experiment concerned with petroleum development" assumes a far more significant character than the Petrostudies report. It suggests the appropriateness now of a full review of the earlier decision to mothball our Operation Plowshare peaceful nuclear explosion program.

It also points up the fallacy of the notion, widely circulated during the past decade by the Club of Rome, Aspen Institute, Ford Foundation, and similar think tanks which peopled top Carter administration posts, that the world, and the Soviet Union in particular, is running out of oil and therefore will be forced to compete for Persian Gulf resources.

* James W. Clarke and Jack Rachlin, "Salym—potential giant oil field in West Siberia, possible reservoir stimulation experiment using a nuclear explosion." U.S. Geological Survey Open-File Report 80-145, 1980.