

Safety of DOE Reactors Questioned

An independent review finds DOE's management of the weapons program to be "confused . . . ingrown . . . self-regulated." Herrington pledges reform

"A high degree of confusion both within DOE [Department of Energy] and among the contractor staff" makes it hard to judge whether nuclear reactors that produce bomb material are being run safely, according to a National Research Council (NRC) report issued on 29 October.

The NRC panel, chaired by attorney Richard Meserve of Covington & Burling, declined to rule on the big issue—whether or not the reactors are safe enough. Instead, it criticized the "conceptual soundness of DOE's approach" to safety issues, focusing on 11 technical points of special concern.

The study, commissioned last year by DOE Secretary John Herrington as a self-critique after the Chernobyl tragedy, leans heavily on technical analysis. But it does not mince words on policy recommendations. Many problems have been obscured for years by an "ingrown . . . loose-knit . . . self-regulated" system whose errors have been hidden from view, the report says. It found little risk of a Chernobyl-like catastrophe, but listed many technical problems that need fixing. It also recommended sweeping managerial changes.

Secretary Herrington's response was swift and positive. He called the report "impressive and constructive" and said, "the department has every intention of responding expeditiously to the recommendations and concerns that have been expressed." He promised to create an independent panel to watch over DOE's nuclear facilities in the future. The department also will draw up an "action plan" within 60 days to carry out many of the recommendations.

Not so enthusiastic was the E. I. Du Pont de Nemours Company. Du Pont announced on 29 October that in 1 year it will quit as manager of the Savannah River Plant in South Carolina, one of the installations under review. Du Pont's board of directors voted not to renew a government contract that expires in September 1988. Du Pont has run the plant for a token fee of \$1 a year since 1950, when—as one observer says—it taught the government how to manufacture plutonium. Three reactors at the site (the K, L, and P reactors) still produce plutonium and tritium for U.S. strategic forces. Wes-

tinghouse manages a fourth plutonium reactor (the N reactor) at the Hanford Reserve in eastern Washington. It is on standby pending the outcome of this review.

Although Du Pont has had an excellent safety record, the company apparently wants to quit while ahead. In a statement quoted by the *Energy Daily*, Du Pont's chairman Richard Heckert deplored proposals in Congress to do away with a total waiver of liability for operating the South Carolina plant. Heckert said the "contentious environment in which we operate Savannah River is consuming more and more management time in an activity that is not for profit and not part of our business mission."

The most compelling example of bad management cited in the NRC report involves the interplay between Du Pont and DOE over the safety of the emergency core cooling systems at Savannah River. According to the report, researchers at Du Pont's

Du Pont plans to quit managing the Savannah River Plant next year.

Savannah River Laboratories knew by 1981 that the assumptions underlying the design of the emergency system were faulty. They suspected that in a crisis involving fuel core overheating, an increase in vapor pressure could retard the flow of water down the narrow coolant channels, leading to "dryout" and further fuel heating. Experiments done in 1979 (two decades after the reactors were built) indicated that this was not a problem. But by 1981, Du Pont researchers realized that the experimental data could not be trusted. For the next 5 years they worked slowly and quietly, with little financial support, to establish the validity of the 1979 data. They failed. Meanwhile, the reactors ran at full power.

In November 1986, DOE learned of the emergency cooling problem and immediately ordered a power cutback of 20%. In March 1987, the NRC panel took another look at the data and sent an extraordinary

letter to Herrington urging further action. Herrington ordered a power cutback to 50% that remains in effect today.

This case, according to the NRC report, is "indicative of the underlying nature of the DOE-contractor relationship," one in which the government relies too much on good faith and not enough on expert, independent analysis. Some of the broad corrective measures suggested by the NRC are:

■ **Set a safety goal.** In principle, DOE wants its reactors to be as safe as commercial reactors, but the idea has been poorly articulated. DOE officials gave "contradictory statements" about its meaning to NRC reviewers. Clarity and specificity are needed.

■ **Make safety orders coherent.** The confusion over goals has led to a "significant ambiguity" in departmental standards and a "lack of vigorous and timely implementation." The report mentions the "delay upon delay" over more than 7 years in carrying out an order requiring that electrical controls be tested for survivability in an accident.

■ **Verify compliance with orders.** Until recently, DOE headquarters made little effort to audit field offices or contract workers for compliance with safety rules. In the 6 years before the Chernobyl accident there were only two safety reviews at the Savannah River Plant and just one at Hanford.

■ **Develop an expertise in antiques.** The reactors that produce weapons material are different from commercial reactors in three respects: design, unique modifications, and extreme age. In writing standards, DOE cannot rely heavily on data from the commercial world because its reactors—different at the outset—have been pushed into an operational realm for which there is no precedent. Great "technological vigilance," including additional research, is required.

■ **Consult outside experts.** DOE has no independent safety review panel for the defense nuclear program. The department should create one, making the bulk of its work available to the public.

Herrington has already agreed to carry out the final recommendation on independent oversight, and several congressional bills propose to make it a permanent feature. ■ **ELIOT MARSHALL**