Study Disputes Reagan Lie Detector Policy

A new congressional study has found conflicting evidence for the accuracy of lie detectors and concludes that the evidence is weakest for the kind of dragnet that the Reagan administration has ordered throughout the government for national security purposes. The conclusions of the report, prepared by the congressional Office of Technology Assessment (OTA), are controversial and, in fact, have been rejected by at least one member of the scientific advisory panel that oversaw the study.

The report, which is a review and analysis of the various validity studies of lie detection, concludes that the strongest evidence comes from research on criminal investigations, where there is a specific crime and a narrowed field of suspects. In such investigations, the report states, lie detectors spot liars at a rate better than chance but with a significant number of errors: Correct detection of guilt ranged from 17 to 100 percent. In cases of general personnel screening, however — either screening of job applicants or periodic testing of employees for unspecified crimes — there exists no scientific evidence to justify the use of lie detectors, the report concludes.

Such screening has become a political issue in the past several months because of the Reagan administration's move to significantly expand the use of lie detectors by all federal agencies. Last year, the Department of Defense (DOD) proposed revisions in its lie detector regulations that would permit pre-employment and periodic screening to determine eligibility for high security jobs. And in March, President Reagan issued a National Security Decision Directive, known as NSDD-84, which instructed directors of all federal agencies to use lie detectors in investigations of specific leaks. Finally, last month, the administration announced that all agencies will be permitted to use lie detectors to conduct periodic dragnets to nab workers breaching security.

Currently, the OTA report indicates, the federal government conducts more than 22,000 lie detector examinations annually (excluding the Central Intelligence Agency, for which data were unavailable). More than 18,000 of those are conducted by DOD, including some 9,000 by the National Security Agency. In response to the administration's actions last spring, Rep. Jack Brooks (D-Texas), chairman of the House Committee on Government Operations, used an amendment to the defense spending bill to prohibit expanded use of lie detectors by DOD until April, 1984, and in the meantime he requested the OTA validity study.

The major argument of the report is that lie detection is theoretically impoverished. According to Boston University psychologist Leonard Saxe, the principal author of the report, there exists no technology for the detection of lying—despite widespread public perceptions to the contrary. Lie detection makes use of a machine called a polygraph, which measures activity of the autonomic (or involuntary) nervous system. Changes in these measurements are taken to indicate fear or nervous arousal; lying is inferred from the fear.

Detecting lies, the report states, is actually a complex psychological process—one which requires that the subject believe in the validity of the test; as a result, whether or not the test is successful depends largely on the examiner's skill in psychologically priming the subject for the test. Because individuals differ both psychologically and physiologically, the test can be expected to identify a certain number of innocent people as guilty and to miss some of the guilty. The report notes that there is insufficient evidence to eliminate the possibility that, with drugs or mental training, people can "beat" the polygraph.

According to Joseph P. Buckley, an adviser on the study and president of the Chicago-based John E. Reid and Associates, a polygraph testing company, the authors ignored important viewpoints in drafting the report. He argues that the basic psychological and physiological principles are well-founded and that there is no reason to assume that they would change from one kind of testing situation to another. More to the point, he says, the OTA researchers, by focusing on validity, ignored abundant evidence of the test's usefulness: That is, most criminal histories are detected not because a subject lies but because, once in the testing situation, the subject admits to having committed a crime. —*W. Herbert*

Eating a hole in the salt dome solution

In many respects layers of subsurface rock salts, known as bedded salts, are desirable as potential sites for isolation of high level nuclear wastes. The salt deposits seal around material imbedded within them, have low water content, and are not found, in general, in areas where crustal movement occurs. Now, however, analysis of the salt beds in such salt domes and their response to heat and radiation has revealed a troubling drawback that may dim their appeal as waste repositories. The bedded salts are easily damaged by ionizing gamma radiation from the packaged waste, which changes the electrical charge of atoms. Researchers find the damage is enhanced by heat emitted from waste containers. Under various conditions this may create highly alkaline or acidic brines that may eat through the exterior of the all-important waste package and hasten corrosion.

At the annual meeting of the Geological Society of America in Indianapolis this week, Samuel V. Panno of Brookhaven National Laboratory in Upton, N.Y., described results of experiments simulating the interactions of salt and salt brine chemistry at different temperatures and radiation levels. Under normal conditions the salt is fairly stable; however, many salt crystals include microscopic pockets of brine. Though the response of the salt units' fluid inclusions apparently varies widely from site to site, Panno says the brine tends to flow slowly toward the container filled with heat-emitting waste. "The salt is extremely reactive," he says. "The combination of heat and radiation changes the pH." (pH is a relative measure of alkalinity or acidity, with a pH of 7.0 considered neutral.)

In the experiments, when irradiated rock salts and brines were exposed to the cumulative radiation levels expected to occur in a repository over a 100-year period (10^{10} rads), the pH of the brine rose to 9.6. The increased alkalinity, Panno believes, is due to the formation of sodium hydroxide (NaOH). Earlier this year, other researchers from Brookhaven concluded that when dissolved by heat, salt brines and rock salts surrounding a high level nuclear waste package could reach a pH of up to 14—an alkalinity level sufficient to "compromise the performance of the waste package."

The researchers also find that at early stages of waste storage, when the radiation levels are highest, a different response may occur. In that event, brine in the presence of rock salt may cause increased acidity — perhaps due to the formation of hydrochloric acid — drawing the pH levels as low as 3.5. Panno says the results do not rule out the possibility of using bedded salts as waste repositories. However, the findings are significant because an increased rate of corrosion could speed the release of radionuclides, the radioactive component of waste. Federal regulations require that the waste package must remain intact for 300 to 1,000 years, and that the radionuclides must be released at a slow and constant rate. —*C. Simon*