

AEC REPORT CONFIRMS LABOR COMMITTEE CLAIM THAT FUSION POWER IS POSSIBLE BY 1980

New Solidarity has obtained a copy of "Subpanel 11 — Fusion Energy" report prepared for the Chairman of the U.S. Atomic Energy Commission (AEC) on October 27, 1973 — part of a comprehensive Federal energy research and development program recommended to the President on December 1, 1973. The report details a "crash" program for producing controlled thermonuclear fusion reactors. This Subpanel 11 report prepared by 24 leading scientists and engineers confirms *New Solidarity's* claim that fusion power can be realized before 1980.

Fusion, the process which fuels hydrogen bombs and the sun's inferno, will not only provide humanity with an economic safe clean energy supply 500 billion times present world consumption, but it will also make possible a new technology — the fusion torch — in which common rock would replace high-grade ores for the production of raw materials. (A recent study at the Battelle Pacific Northwest Laboratories shows that fusion torch can also "burn up" dangerous radioactive wastes now produced by dangerous nuclear fission reactors.)

At the Joint Meeting of the American Physical Society and American Optical Society in Washington, D.C. two weeks ago, *New Solidarity* exposure of the CIA-controlled AEC sabotage of fusion research brought a mixed response. The AEC attempted to obfuscate NCLC's* exposure with an announcement that the experimental date from Sandia Labs, which had been suppressed, were now released. More significantly, Dr. Trivelpiece of the AEC stated that the 1973 U.S.-USSR protocol on joint fusion research could be interpreted to include laser-fusion. Previously, U.S. policy excluded laser-fusion research from joint Soviet-American research. The appropriate Soviet authorities are being approached by *New Solidarity* to confirm whether or not this change in U.S. policy is actually being implemented.

The Subpanel 11 report points out that: "Based upon the present understanding of magnetic plasma confinement, there appear to be no plasma physics reasons why a power producing fusion reactor could not be built today. However, it cannot yet be guaranteed that this can be accomplished in an economic, reliable system for practical use" (emphasis theirs). Furthermore: "Fusion temperatures have been attained in magnetically confined plasmas since the early 1960's. During the 1969-71 period, near maximum theoretically possible plasma confinement was achieved in a number of different, relatively small experiments. In the past year, remarkable progress was made in scaling to larger plasma sizes, successfully testing new heating techniques, and achieving stable plasmas in improved geometries. All of these accomplishments were in accordance with preoperational theoretical prediction, an attainment not previously realized. These successes profoundly affect the assessment of when practical fusion power plants might be built." Also: "The European program is now unifying under EURATOM and is about twice the size of that in the US. The Japanese effort is possibly 20 to 30 per cent of the US program, while that in the Soviet Union is between two and three times larger. *The Soviet effort encompasses the same features as that in the US, with emphasis on the Soviet developed Tokamak concept, the Stellarator, and laser fusion. The USSR has about 50 major CTR and plasma research experiments in operation at seven major research centers; the Soviets have obtained results on a par with, and in many cases have surpassed, the US program*" (emphasis theirs).

Confirmation of these experimental successes should be achieved in the next six months in the French Tokamak now operating. Experiments at Lawrence Livermore and Los Alamos will also demonstrate the viability of two other fusion reactor design concepts. (Not to mention Soviet experiments now on line.)

The Necessity for New Technology

"Once the plasma related problems are solved by either magnetic containment or laser fusion, the other principal research problem that must be solved before the achievement of fusion power is the materials radiation damage problem. This will require extensive experimentation with a variety of metals and alloys, and in the final analysis the nature of the solution to this problem will probably be a determining factor in fusion power economics. *"It is the opinion of the Subpanel that the development of the necessary new technologies will then become the critical factor in developing magnetically confined plasma fusion power systems."* For example, "massive development programs in superconducting magnets and associated refrigerators, reactor coolant technology, shielding, tritium handling, plasma heaters, sophisticated control systems and associated diagnostic sensors, materials development, and energy storage."

In short, *"the Subpanel believes that the primary implementation barrier will be the development of an industrial base to produce fusion power systems."* Also, certain capitalist prerogatives would have to be held in abeyance: "This is the program in which administrative problems such as patent rights would have to be put aside."

The "crash" program proposed in Subpanel 11 report would produce a Physics Test Reactor by 1978-79 and an Experimental Power Reactor by 1980. According to the panel's estimate once fusion reactor "feasibility" has been demonstrated it would take another 10 years to create the industrial base to produce functioning fusion power plants. The crash program itself would cost only a conservative \$16 billion over 15 years.

A serious "brute force" program would allocate \$16 billion per year with expenditures in the \$100 billions in the later years of the program. Fusion will provide humanity with the basis for a whole new mode of production and must be approached from that total perspective.

In their timidity, the panel's "crash" program diverts immediately to fusion research only two existing particle accelerators (to test reactor materials). All other research facilities would have to be built from the ground up. The proposed NCLC brute force program would divert most, if not all, existing military, aeronautic, and space laboratories together with appropriate industrial research and development facilities to fusion research.

Computers which are essential to theoretical plasma physics work and reactor design, under the panel's plan would be built over three years. The NCLC program would immediately divert the existing Illyac and CDC 7600 computer facilities combined with a crash program to produce the necessary computer facilities, within one year.

The Manhattan Project — the crash program to produce atom bombs during World War II — confronted the problem of creating a new industrial base. Project scientists solved that problem, though, within two years through "brute force" parallel development of working capacity.

1990's — Too Late

The Subpanel's crash program projects the industrial base to mass produce fusion reactors for the 1990's. The NCLC program would create this capacity parallel to

physics test reactor experimentation. For example refractory metals or alloys such as niobium or vanadium would probably be needed for high temperature reactor wall material. The NCLC program would create the industries to produce these metals before it had been experimentally resolved which alloy could withstand the fusion plasma conditions.

To alleviate the waste inherent in the NCLC brute force program, fusion torch technology with high temperature plasmas now being produced would be immediately applied to the appropriate chemical industries. This would not only productively create the necessary industrial base for all possible designs of fusion reactors but also provide the necessary working experience with high temperature plasmas so that many reactor systems could be tested before incorporation into a fusion power plant.

With the maximum level of manpower and industrial resources focused on the development of several different reactor designs, it is likely that most of the materials and technological problems can be resolved within two to three years. (The U.S. already has several national labs which were produced by the Manhattan project to solve just these types of problems.)

In the NCLC program most existing laboratory facilities and manpower presently engaged in the aero-space-defense industries would be redirected together with all military labs and fast breeder nuclear fission facilities to fusion research. Training and retraining programs would be initiated to produce the necessary number of physicists and engineers. While the industrial base to mass produce each of the possible fusion reactor designs would be created, basic research would be expanded by a factor of 50 rather than the AEC proposed increase by a factor of 3.

The Subpanel II crash program would build 3 Experimental Fusion Power Plants, the first by 1980. The NCLC program would produce 10 such plants by 1979 at the latest. In fact most of the power plant prototypes could be built with existing materials; incorporating the materials which are developed simultaneous with the testing of prototype reactors into the first generation of the 100 functioning 5000MW power plants produced in year 5 of the NCLC program.

As the AEC report points out: "Because certain aspects of laser-fusion-research are classified, the Atomic Energy Commission monitors all privately sponsored laser-fusion research in the United States...Because of these security considerations and associated patent questions, most industrial institutions participating in this area must enter into extensive no-cost contract negotiation with the AEC. This has been a serious deterrent to industrial involvement." In fact, as the report goes on to reveal, Rockefeller's own Exxon Oil controls the major civilian effort in this area of fusion research.

Laser-fusion could be demonstrated as scientifically feasible within one year with development of large, efficient laser and associated optical system being the "pacing effort in the development of laser-fusion reactors." It is therefore possible that this approach could succeed within a few years.

Scientists Kneel Before Rockefeller

The failure of the fusion subpanel to commit the resources necessary to produce controlled fusion in the shortest possible time is a direct result of the capitalist-dominated mainstream of scientific thought of the last 40 years. It is not coincidental that the last major breakthrough in physics, the general theory of relativity, occurred in 1917. Attached to a decaying capitalist system, science has been limited to producing efficient weapons systems (now measured by mega-deaths per

mile), rather than producing the breakthroughs necessary for human reproduction.

The total breakdown of the morality of these scientists is evidenced by the fact that the hegemonic faction of physicists involved in fusion advocate Zero Growth — the Rockefeller-sponsored fascist policy of mass murder. The leading AEC advocate of the fusion torch, William Gough, in his article "Environmental Interrelationships" demands that scientists further investigate capitalist techniques for mind control rather than the real question of human survival.

"Since it is in the mind that individual and social values are rooted, the research may provide a new means of obtaining consensus of value questions." Suggested research areas are: "1) biofeedback control of the brain... 2) psychedelic chemicals, and 3) conventional techniques of meditation, hypnosis, yoga, etc."

Mr. Gough has made leading contributions in demonstrating that fusion will provide man with an almost infinite source of energy and raw materials (even biological), limited only by the total mass of the earth (and eventually the universe). Yet he and his colleagues do not have the guts to stand up to Rockefeller and fight for the only rational development which will support the continued existence of humanity. Only the politically conscious vanguard of the working class will provide the moral strength and energy for the realization of fusion power. The only other alternative is Rockefeller-controlled descent into cannibalism typified by the later years of Hitler's Third Reich. Fusion is, at this point in history, the cornerstone of socialist program. As the entire capitalist debt structure veers toward total collapse, fusion research will be the first to go. The leading physicists of the AEC are begging Rockefeller for whatever they can get. They have thus proved two things with their report — 1) that the implementation of fusion power is objectively possible in the next five years, and 2) that this necessary advancement will only be realized under the leadership of the international working class.

* See IPS, Vol. I, No. 2 for a report on the meeting and the text of the National Caucus of Labor Committees' Fusion Power Draft Resolution.

Eleven documents and graphs from the AEC report of Subpanel 11— Fusion Energy— appear in the Appendix.