"These people have too many reservations . . . shared too generally, for me to pass off," Rittenhouse said. "These reservations [concern] portions of the LOCA. Maybe they're just not sure what's going on."

Some of the most damaging criticism of the way the AEC handled the core cooling question has found its way into the hearing record in the form of internal AEC correspondence and memoranda. The commission itself released a large number of such documents after Cherry threatened to sue for them under the Freedom of Information Act. Other revealing letters, reports, and memos have arrived in unmarked envelopes in Cherry's morning mail. "The AEC leaks like a sieve," he says.

One document which the AEC released during this period was a "Dear Jim" letter, which Alvin M. Weinberg, the director of Oak Ridge National Laboratory, wrote to AEC chairman James Schlesinger on 9 February. In it, Weinberg expresses a "basic distrust" of the sort of computer calculations that the Hanauer group advocated for evaluating ECCS performance, "especially where the calculations have not been checked by full-scale experiments . . . and the consequences of failure are serious."

Weinberg makes a second point worth quoting at length, for it hints at one major cause of the AEC's present embarrassment:

> I have one other point, I believe ORNL and the other National Laboratories should have been as intimately involved in the preparation of the interim criteria as we have since been in the preparation of AEC testimony for the hearings. That we were not so involved reflects a deficiency in the relation between Laboratory and Commission that troubles me. I continue to believe that the rather independent expertise of the national laboratories—an expertise which can only be maintained through complete access to information—must be called upon fully by the Commission even when this may uncover differences of opinion between the laboratories and the staff of the commission.

So far, dissent has been concentrated in the laboratories, but it is by no means limited to them. The most severe and detailed criticism of the AEC's handling of the ECCS affair has come from two members of the commission's own regulatory staff, Morris Rosen and Robert J. Colmar. Until the staff was reorganized earlier this year, Rosen headed the systems performance branch of the Division of Reactor Standards and Colmar was his deputy. Together they were directly responsible for day-to-day evaluation of backup cooling systems.

The hearing record shows that last 1 June, Rosen and Colmar fired off a strongly worded memo to the Hanauer task force urgently protesting that the criteria it was about to issue were not conservative enough and would not prove "technically defensible" as a basis for reactor licensing. They contended that the computer models that figured so prominently in the criteria were crude and arbitrary, and rested on only a thin foundation of experi-

APS Challenged on Bulletin Censorship, Charter Changes,

At last week's American Physical Society meeting in Washington, D.C., the society's liberal wing acted less flamboyant than in the past but, nonetheless, gave APS leaders a run for their money. If the APS is any index, protest in scientific societies is alive and well.

Despite the provocations of the Indochina bombing, the physics activists last week focused on APS internal affairs: Censorship by the *Bulletin* of publication of the abstracts for the Forum on Physics and Society, and a proposed broadening of APS's constitutional statement of goals that would legitimize and extend the society's nontechnical activities.

The militant actions of the past, such as the 1969 march on the White House, have been known to leave crusty APS leaders howling—but these internal business dealings seem to have succeeded in aggravating some ulcers, too.

The censorship fight was a first test of the forum, the safety valve, quasi-division of APS organized in January for talking about physicists, instead of physics. At issue were the abstracts of a forum session, with Jay Orear of Cornell as chairman, on "Some recent case histories" relating physicists and public affairs. Raphael Littauer of Cornell would present the final edition of his much-publicized study of the air war in Indochina; William C. Davidon, of Haverford, who was at one time named a coconspirator in the plot to kidnap Henry Kissinger, would talk on the war and scientific workers; Leonard Rodberg of the Institute of Policy Studies would talk about the Pentagon Papers, and Pierre Noyes of the Stanford Linear Accelerator (SLAC) would discuss the legal—or rather the illegal—aspects of the Vietnam war. It was all to be very topical and newsworthy. But when W. W. Havens, executive secretary of APS, received the abstracts of these talks in February, as he said later, "I did not think the abstracts advanced the objectives of the society," which according to the APS constitution, article II, are "the advancement and diffusion of the knowledge of physics."

The real sticker, it turned out, was Davidon's abstract, which mentioned "inactivating equipment intended for killing or harming people" as a "needed" activity. (Davidon's actual talk was about a real incident, an alleged wrecking of 300 bomb casings at the American Machine and Foundry plant at York, Pennsylvania, for which 2000 people, by signing a statement, took responsibility.) Bomb sabotage, it should be noted, is not a subject that crosses the desks of executive directors of the APS every day, and Havens naturally referred it, with the whole package of forum abstracts, to the APS executive committee, which vetoed their publication.

The censorship of the abstracts looks like a form of sabotage of the new forum, but forum spokesmen prefer to call APS leaders "confused" as to how to react to the challenge it poses. In recent years, a group of left-liberal activists, including Brian Schwartz of the Massachusetts Institute of Technology, Martin Perl of SLAC, Seymour Koenig of IBM, and others, have been urging APS to take more responsibility for social issues where physicists

mental verification of questionable relevance to the huge power reactors currently being built.

They argued that uncertainties of ECCS performance appeared so great, and the sophistication of present computer models so poor, that a more prudent course of action would be to institute a moratorium on reactor design changes and power-level increases. At the same time, they urged a rapid acceleration of core cooling research.

Hanauer has acknowledged that the task force received and discussed the memo. But its advice is not reflected in the regulations the task force issued 18 days later.

It appeared at one point that the AEC would not allow Rosen and Colmar to testify at the hearing. A lower-level decision to this effect is said to have been reversed by L. Manning Muntzing, the new director of regulation.

The two engineers testified on 12 and 13 April, and from all appearances the passage of 10 months had only heightened their qualms. Rosen presented an 80-page critique of the interim criteria in which he charged that "undeniably serious gaps" exist in knowledge of ECCS reliability. He said that he found it "disturbing and discouraging" to see the dissenting views of what he believed to be a large majority of experts available to the regulatory staff "still being basically ignored."

"Margins of safety once thought to exist do not," Rosen warned, "and yet reactor power levels continue to increase, resulting in an even more tenuous situation."

(In an interview, Rosen and Colmar attached an important caveat to this statement. They said that, in their opinions, the probability of an individual reactor suffering an uncontrollable accident is low enough—and the present number of reactors is small enough—so as not to pose an undue risk to public safety. "We're not saying reactors working today are going to blow up," Colmar emphasized. "What concerns us is the future situation, when 100 reactors are running in the mid-1970's and a thousand by the end of the century.")

For his part, Colmar traced the history of the AEC's apprehensions and the genesis of his own dissent. On the strength of his story, he and Rosen would seem to rank in the major league of government whistle-blowers.

Colmar testified that in February 1970 he was assigned to evaluate a new and relatively sophisticated computer model of a loss-of-coolant accident which Westinghouse had developed for its reactors. Colmar said Westinghouse was highly enthusiastic about the model, which it called SATAN, partly because the company thought it demonstrated more-than-adequate capacity in backup cooling systems and perhaps even enough to permit a simpler, less costly design.

Colmar soon came to precisely the opposite conclusion. Westinghouse was reading its own model incorrectly, and far from showing excess cooling capac-

by Activists Concerned about War, Physicists' Role

are involved. Last January, the APS approved the forum, largely as an institutionalization of some informal sessions that Schwartz has been organizing at APS meetings for the last several years. Then, in February, the executive committee vetoed publication of the abstracts. At a Sunday meeting, the APS Council turned around and set up some appeal procedures for what to do when this happens again.

The real issue underlying the censorship, and one faced by other science societies, is whether and how APS should respond to pressure to include political and social material in its publications, meetings, and structure. Some in APS officialdom believe, as do many professional society leaders, that the antiwar movement and employment crisis, both of which have sparked these pressures, will just go away; hence, APS can get away with inaction. However, the activists want to broaden APS permanently, and this is what the second major issue at the meeting, the March amendment, was all about.

Sponsored by Robert March of the University of Wisconsin, the amendment would add to the APS's constitutional statement of goals (which is now only the advancement of physics) "the enhancement of the quality of life for all people," and assisting the membership in "pursuing these humane goals" and that APS will "shun those activities which are judged to contribute harmfully to the welfare of mankind." Such an addition, March says, would strengthen the hand of the forum and, in effect, justify its existence in APS. The proposed amendment is worded so blandly that one physicist termed it a "motherhood statement." Yet for something as American as apple pie, it has managed to find enemies in the APS, and it is given slight chance of winning the two-thirds vote it needs to pass.

Like their counterparts in one wing of the student antiwar movement, the APS activists have, in the more recent, so-called quiet years, turned to educational reform as the best way to reform the system. The forum held another session on physics education, where March, along with Earl Callen, of American University, and Leonard Eisenbud of the State University of New York, Stony Brook, talked about their attempts to reach out to the nonscience student, the antiscience student, and even the technically immersed graduate student in physics who has no overall scheme or philosophy of what he is doing and is unable to communicate with laymen. The session drew a fair amount of interest and attention, despite the fact that it was more about education than physics, and therefore outside the current purview of APS.

The APS reformers may think themselves an isolated fringe of the physics community but they may not be. As it happened, the establishment at the meeting, in the form of the Center for the History of Physics, was passing out copies of an old speech by J. Robert Oppenheimer, who, in a 1962 speech, spoke warmly of the "hardly paralleled dedication and responsibility of physicists to the great, dark, tangled and ununderstood cause of a peaceful world."—DEBORAH SHAPLEY