in the section are solid-state physics, directed by Dean L. Mitchell (formerly of the Naval Research Laboratory) with associate Richard Silberglitt; solid-state chemistry (director to be named) and quantum solids and liquids, directed by Thomas A. Kitchens, who is on leave from Brookhaven National Laboratory.

▸ Materials Research Laboratories. This section, unaffected by the reorganization, is headed by Roman J. Wasilewski with assistance from staff associate William Bernard.

▸ Metallurgy and Materials. Heading the section is Charles A. Wert, on leave from the University of Illinois. The programs and their directors are: metallurgy, Robert J. Reynik; ceramics, Paul K. Predecki (formerly of the University of Denver), and polymers, Paul H. Lindenmeyer (on leave from Boeing).

Two others assigned to the division are Wendell S. Williams (on leave from the University of Illinois) and William T. Oosterhuis. Williams is a task coordinator for energy research—one of six such coordinators who are working out of the NSF Energy-Related General Research Office. Oosterhuis is the staff associate for special projects.

Two recent grants affecting the division are an award of $242 800 to the Materials Research Laboratory at Pennsylvania State University (making it the 15th NSF supported MRL) and a $350 600 grant to the University of Wisconsin for the operation and maintenance of the synchrotron radiation facility at the physical sciences laboratory. It was previously supported by the Air Force Office of Scientific Research.

AEC study assesses risk to public as small

The Atomic Energy Commission has released a 14-volume reactor-safety study with an overall conclusion that "the risks to the public from potential accidents in nuclear-power plants are very small." Preparation of *An Assessment of Accident Risks in US Commercial Nuclear Power Plants* was a two-year, $3-million effort under the direction of Norman C. Rasmussen (MIT). The conclusions and statistics were developed for 100 operating nuclear generating plants—the number projected to be in operation in 1980 and twice the number in operation now.

The study was conducted for water-cooled reactors only. Although gas-cooled and liquid-metal fast breeder reactors are being developed, they are not expected to be operational during the 1970's, according to the study, and were not considered. In estimating the risks involved, the study includes probabilities of injury, death and property damage in case of a reactor accident and found these risks to be small compared to non-nuclear accidents of similar consequences, such as fires, dam failures and hurricanes.

The report states that the risks from nuclear-power plants are primarily from release of radioactivity and that "the only way potentially large amounts of radioactivity can be released is by melting the fuel in the reactor core." The probability of a core-melt accident, says the study, is one in 17 000 per reactor per year, or one accident in 170 years for the 1980 projected complement of 100 plants. Estimated fatalities among the 15 million people living within 20 miles of reactor sites is 0.3 per year (as compared to 560 per year for fire or 4200 for automobiles for the same number of people). Because no accidents or fatalities have yet occurred, a technique called "event trees and fault trees," developed by the Department of Defense and NASA, was used to estimate probabilities. This involves postulating an initial failure (event tree) and then determining the likelihood of safety-system failures (fault trees) along various pathways representing sequences of events after the initial failure.

Comments on the report have been invited until 1 November with a final version to be issued several months after the comments are received. Copies of the main report are available from NTIS, Dept. of Commerce, Springfield, Va. 22151 for $7.60 (main report) and $174.50 for a set of appendices. A 30-page popular summary is available free from the AEC Technical Information Center, Oak Ridge, Tenn. 37830. —RAS

Reactor problem

Cracks detected in auxiliary pipes of three boiling-water nuclear-power reactors have prompted the AEC to issue an inspection order to all such power plants in the US. The action comes one month after the release of an AEC reactor safety study (see main story).

The directive, issued on 19 September, affects 15 nuclear plants that have the particular pipe in question—a four-inch equalizer line that is used during the plant's start-up procedure. The plant operators are required to carry out a detailed inspection of the pipes within 60 days or sooner if the station is already shut down or is to be shut down within the period. As of 1 October, according to an AEC spokesman, six of the 15 plants have reported no cracks, leaving six plants yet to report.

The three stations where cracks were initially detected in September are at the Dresden and Quad Cities Nuclear Power Stations, both operated by the Commonwealth Edison Co in Illinois, and the Millstone Nuclear Power Plant, operated by the Northeast Nuclear Energy Co in Connecticut. The AEC says that radioactivity has not been released due to the cracks and that the core-cooling capability has not been affected.

Teem

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basic physical research," he continued, "because it is no different from any other part of the economy in that there is a significant problem with inflation. Since most of the physical research in the US is supported out of the federal budget and since most areas of the budget are difficult to cut, it is one of the discretionary areas. The pressures are going to be very, very real on physical research, not only on the AEC or ERDA, but also on other agencies." Unlike some scientists, however, Teem does not believe that physical research is going to be a scapegoat in any attempts to cut the budget. "I see every indication that people recognize that basic research is important to the long-range economic health of the nation, not only to its energy problems," he said. "I don't feel the negative vibes some people seem to have."

Frontier areas. Despite hard times financially for all areas of physics, and particularly high-energy physics, Teem is excited and optimistic about the vitality of physics research. Areas in which there is a keen sense of anticipation, according to Teem, include the medium-energy field, applications of superconductivity, design of materials from first principles, and a basic understanding of catalysis.

"In high-energy physics, particularly, this is a very exciting time," Teem emphasized. "There is a sense of opening up and bringing things together which has not been there in the last five or ten years. Time will tell whether this unification is, indeed, realized."

He points to results coming in from the Fermi Lab in Illinois and from the Intersecting Storage Rings at CERN. "This is coupled with the fact that there were early indications from the electron–positron rings in Italy, followed by experiments at the CEA [Cambridge Electron Accelerator], which have now been extended and confirmed at the SPEAR [at the Stanford Linear Accelerator Center], on hadron production higher than that predicted by any of the quark models. We are seeing definite disagreements that hopefully will now lead to insights into why many of the quark ideas have been qualitatively confirmed but never quantitated."

One of the problems in high-energy physics, Teem acknowledged, is the need for expensive facilities to carry out the research. Teem views this need as part of the "general, unequivocal character of high-energy physics. You gain insight by moving into new energy