

annual supply levels adequate only for the requirements up to the year 2000, assuming the highest growth projections. NASAP estimated that uranium supply will satisfy demand in the US at least until 2010 without resorting to the breeder. During that two-year interval, forecasts of future world energy demand dropped sharply, and many countries revised downward their plans for installing nuclear power.

One interesting approach to breeder deployment has been put forth by IBM physicist Richard Garwin. He says that we can greatly reduce the hazard of proliferation associated with the breeder reactor by delaying its deployment and designing reactors that produce less weapons-usable plutonium. Nuclear power experts have traditionally encouraged early deployment of the breeder and development of high breeding ratios (the ratio of isotopes consumed to isotopes produced) in order to generate enough plutonium to fuel succeeding generations of breeders. But Garwin's calculations show that by fueling not only the first generation but each deployed liquid-metal fast breeder reactor initially with U^{235} rather than with reprocessed plutonium, we can sustain a reactor for more than 2000 years of operation at 1000 MW(e), even if there were no excess plutonium production in the mature LMFBR (that is, a breeder ratio of one). According to Garwin, his proposal to start the reactor operating with enriched uranium would allow a large,

rapid deployment of breeders when they are economically desirable without the necessity of premature commercial breeder operation or plutonium separation. An available uranium resource of 3.5 million short tons of U_3O_8 would fuel 1000 LMFBR's for more than 2000 years even if their breeding performance were far worse than has already been demonstrated, he says.

Garwin's approach to breeder deployment has several nonproliferation advantages: We would not need to separate plutonium now to fuel future breeders. Nor would we need to deploy first-generation breeders now, when they are not economically competitive with either LWR or fossil plants. Finally, opting for lower breeding ratios can eliminate the production of excess Pu that could be diverted for weapons uses.

The emphasis of breeder research should therefore shift from trying to raise the breeder ratio to modifying the design of the LMFBR to make it cheaper, safer and reduce the uranium investment required to fuel a new LMFBR, Garwin says.

Garwin's proposal will have a hard time winning acceptance. Both the INFCE and the NASAP studies recognized that breeder deployment decisions will be made for reasons of energy security as well as for economic considerations, and that different countries will reach different conclusions as to the timing and need for the breeder.

—MEJ

said universities will be hardest hit by the cuts, because the national labs are working under contracts that cannot easily be broken.

—MEJ

Cornell synchrotron seeks beam proposals

Proposals for experiments to be conducted at the Cornell High Energy Synchrotron Source (CHESS) facility, are now being considered. At present, three beam lines are fully operational and can supply radiation to four experimental stations. Intense polarized radiation in the hard x-ray energy range (a few keV and above) is available at these stations, and the characteristic energy of the radiation lies in a range of up to 35 keV. Proposals that would exploit this feature of the facility will receive preference. CHESS will provide the capability to facilitate studies in EXAFS, x-ray topography, small-angle scattering, Compton scattering, deep level spectroscopy and x-ray crystallography, but experiments need not be limited to these areas. Details on the current instrumentation and available facilities can be obtained from the director, B. W. Batterman, telephone (607) 256-5161.

Beam time will be allocated according to the recommendations of a review panel and the expected schedule of operation of the CESR storage ring. Proposals should be submitted by 15 August to Proposal Secretary, CHESS, Clark Hall, Cornell University, Ithaca, New York 14853.

House group cuts DOE 1980 funds

In its attempt to reduce Federal expenditures the House Appropriations Committee has cut the Department of Energy's Fiscal Year 1980 appropriation for physics research by \$19 million. While considering DOE's 1980 supplemental request and proposed rescissions, an appropriations subcommittee decided to make the additional cuts in the energy research budget. The action was unusual in several respects: For one, it was made halfway through the fiscal year, when some of the money involved had already been promised to national laboratories and universities. Also, the Committee was unusually specific in its proposed cuts, at times getting down to the project level. Such specifics are usually left to the Committee on Science and Technology.

The Appropriations Committee reduced the high-energy physics budget by \$8 million, \$4 million of which is to be removed from Brookhaven's Isabelle construction project budget until 1 October. This will result in a slower construction schedule, Edward Frieman, Director of Energy Research, told

PHYSICS TODAY, and raise the total cost of the project by \$5 million. Heavy-ion physics is reduced \$1 million. Another \$1 million is to be gained by deferring the construction of the National Superconducting Cyclotron at Michigan State University. And \$2 million is to come out of the magnetic fusion program. The Committee recommended that DOE make this cut by stretching out the development and construction schedule of the Elmo Bumpy Torus proof-of-principle project.

Following the Committee's action DOE appealed the rescissions (repeal of funds) to the Senate Appropriations Committee, but as of this writing, the Senate is not expected to disagree with the cuts.

The cutbacks could have some severe effects if they are made law, according to DOE, including staff layoffs and equipment shutdowns. Ronald Young, with DOE's Office of Energy Research, told us that, as an example, SLAC may have to extend its regularly scheduled maintenance shutdown to the end of the fiscal year in September. Frieman

Langenberg named NSF deputy director

Richard C. Atkinson has resigned as director of the National Science Foundation and is now chancellor of the University of California at San Diego. Atkinson had been NSF director since 1977 and served for two years before



LANGENBERG