

Sox Lead World Series 2-0, Game 3 Saturday

MIT's Oldest and Largest Newspaper



The Weather

Today: Morning sunshine, 58°F (14°C)
Tonight: Light rain likely, 53°F (12°C)
Tomorrow: Warm and windy, 72°F (22°C)
Details, Page 2

Volume 127, Number 49

Cambridge, Massachusetts 02139

Friday, October 26, 2007

Sophomore Allegedly Stabbed by Wellesley Student Seven Times

Nick Semenkovich NEWS EDITOR

A sophomore was stabbed seven times in his Next House residence on Tuesday, Oct. 23, prompting a review of housing security policies.

Anna L. Tang, a Wellesley College junior who was taking classes at MIT, allegedly stabbed her ex-boyfriend, Wolfe B. Styke '10, as he slept. On Tuesday, Tang was charged in the Cambridge District Court with home invasion and armed assault with intent to murder.

At 6:28 a.m. on Tuesday morning, Cambridge Police received a 911 call from Styke indicating that he had been stabbed and identifying Tang as his attacker. Arriving at the second floor of the east wing of Next House undergraduate dormitory, Cambridge Police found Styke standing at the door to his room and "bleeding profusely from multiple stab wounds," according to a police report. Styke suffered severe but non-life threatening stab wounds to his neck, chest, right upper arm, left rear shoulder, and left leg.

Styke told a Cambridge Police officer that he did not know where Tang was. At that point, Tang, who was standing approximately 20 feet down the hallway, said, "Here I am." Tang was then placed under arrest and her jacket and backpack, which were both covered in blood, were taken as evidence. Her backpack contained a small folding buck knife, according to the police report. Tang told the arresting officer that she had multiple knives and lost control of the first one during the attack, according to the report.

Wolfe is recovering at Massachusetts General Hospital and is in serious condition, according to the Associated Press. In a statement issued by Pamela Dumas Serfes of the MIT News Office, MIT is "heartened by the progress he has shown in his recovery" and is "cooperating fully with the Cambridge Police Department and the Middlesex District Attorney's office on their investigation."

"Our hearts and minds go out to the people at MIT affected by this," said Arlie Corday, a spokesperson from the Wellesley Office for Public Affairs. Wellesley is "trying to help our students to cope with this news." Disciplinary action is premature at this point, Corday said.

Tang is currently being held at the MCI-Framingham correctional facility, pending a 58A dangerousness hearing on Tuesday, Oct. 30. Meredith Lerner from the Middlesex District Attorney's Office said that a dangerousness hearing is a bail review and gives the Commonwealth more time to gather evidence.

Tang's defense attorney, John Valerio of Andover, did not return a call for comment yesterday. Residents of Next House held an impromptu prayer session the mid-night after the assault, said Samuel H. Poon '09 who lives next door to Styke. "We prayed a word of blessing for him and his family," Poon said.

Then narrative from the police report and full text of the MIT statement can be found on page 12. Court documents regarding Tang's arrest, booking, and criminal docket are available

Stabbing, Page 12

Abnormal Radiation Level Reported

MIT's Nuclear Reactor Laboratory Reports High Readings for One Worker



The control room of the MIT nuclear reactor is shown in this Tech file photo.

By Joyce Kwan NEWS EDITOR

The MIT Nuclear Reactor Laboratory is currently being inspected by the Nuclear Regulatory Commission after a worker was exposed to unusually high levels of radiation.

After a regulatory check that occurs every three months, a worker's dosimeter, a pen-like device used to measure radiation exposure, had an accumulated reading of about 4 rem of radiation. The NRC annual occupational limit for radiation exposure is 5 rem per year, according to an NRC press release. Typically, readings of 0.5 rem or less are expected.

Readings for all other workers were normal for the same time period, July to September 2007, according to an MIT press release.

Although this atypical reading was below the federal safety limits, the Institute voluntarily notified its own safety officials and the U.S. Nuclear Regulatory Commission," the MIT press release states.

MIT reported the readings on Oct. 17, according to the NRC press release. Claude R. Canizares, associate provost and vice president for research, said that it is not known if the anomalous reading is accurate, but authorities are acting on the assumption that it is.

The situation is not considered very serious, but its cause needs to be determined, Canizares said. The situation "poses no danger to public health and safety or to the environment," according to the MIT press release.

The worker's exposure to radiation will not surpass the allowed dose for the year, Pamela D. Serfes, executive director of the MIT News Office, told the Boston Globe. The worker, described by Serfes as an operator, has suffered no ill consequences.

According to the NRC press release, the NRC will review how the laboratory implements its radiation protection program in addition to looking for factors that may have caused the anomalous reading. The NRC expects the inspection to take two to three weeks. A public report

Reactor, Page 10

Twenty Percent Donate In Underclassmen Giving

Approximately 20 percent of freshmen, sophomores, and juniors donated to this year's Underclassmen Giving Campaign last week, topping the participation rate of last fall. A total of \$3,521 was raised to fund Public Service Center expedition grants for the January Independent Activities Period.

The giving campaign, which lasts two weeks — one week during the fall semester and one week during the spring — was first piloted last year. The pilot was considered successful as the goal of 20 percent participation over the course of those two weeks was met.

During the first week of last year's campaign, approximately 15 percent of underclassmen donated about \$2,500. The two-week total last year was \$3,880. This money funded about nine PSC grants, said Rosheen B. Kavanagh of the MIT Alumni Association. Kavanagh is in charge of the UGC and the Senior Gift.

This year, students gave a total of 630 gifts, with 31 percent of freshmen donating \$1,770, 17 percent of sophomores donating \$1,035, and 12 percent of juniors donating \$715.

An addition to this year's campaign was the ability for students to donate online; approximately 50 students donated online. All other students donated in Lobby 10 last week.

The UGC was started to develop a sense of philanthropy among underclassmen at MIT, as seniors contribute to the Senior Gift. The class project and goals for the Class of 2008's Senior Gift will be announced on Nov. 8, Kavanagh said.

—Angeline Wang



Yale Professor Charles Perrow (right) gave the Arthur Miller Lecture on Science and Ethics on "The Next Catastrophe: Reducing Our Vulnerabilities to Natural, Industrial, and Terrorist Disasters" in the Media Lab's Bartos Theater on Monday, Oct. 22. He is the author of a book with the same title.

In Short

Facilities will split into two pieces beginning Nov. 5. MIT Police Chief John DiFava will head up the Operations and Security division, which will include Repair and Maintenance, the Campus Police, Parking, Custodial, and Grounds. Capital Projects and Strategic Planning will form the other division, which will be run by Dick Amster, formerly of Turner Construction. MIT's position of Chief Facilities Officer had been vacant since the departure of William J. Anderson, who left the Institute earlier this year.

Free taxicab rides will be provided from 6 p.m. tomorrow until 3 a.m. the following day by the Cambridge Taxi SafeRide Home Program on account of the Red Sox and the World Series. Any MIT student or affiliate needing a ride should call 617-876-2000 and mention the name of the program. Maximum \$35 value on cab fares.

Rock Band Video Game Tour is stopping at MIT on its 24-city nationwide tour. The top two student bands that perform from the entire tour will be selected to be on MTV. The event will be from 11 a.m. to 6 p.m. today at the Zesiger Fitness Center.

MIT received a B+ on this year's college sustainability report card, produced by the Sustainable Endowments Institute. MIT failed the category "endowment transparency." The report card is available at http://www.endowmentinstitute.org/sustainability/profiles2008.html.



The Green Building lights up in support for the Red Sox.

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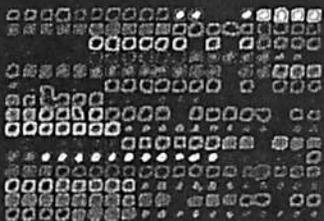
News One Laptop Per Child foundation seeks buyers for low-cost laptops.

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TECHNOLOGY-DRIVEN STATISTICS

Clay Public Lecture



Tuesday, October 30 at 7 pm

Professor Terry Speed
University of Colorado, Berkeley and Walter & Eliza
Hall Institute of Medical Research, Melbourne, Australia

Harvard University
Science Center, Hall B
One Oxford Street, Cambridge, MA

Forty years ago, biologists collected data in their notebooks. If they needed help from a statistician in analyzing and interpreting it, they would pass over a piece of paper with numbers on it. The theory on which statistical analysis was built a couple of decades earlier seemed entirely adequate for the data. When computers became widely available, analysis became easier and a little different with the term "computer intensive" entering the lexicon. Now, in contemporary biology and many other areas, new technologies generate data whose quantity and complexity stretches both our hardware and our theory. Genome sequencing, gene chips, mass spectrometers and a host of other technologies are now pushing statistics very hard, especially its theory. Terry Speed will talk about this revolution in data availability, and the revolution we need in the way we theorize about it.



Terry Speed has a joint appointment between the Department of Statistics, University of Colorado, Boulder and the Walter & Eliza Hall Institute of Medical Research, Melbourne, Australia. He is also a senior research advisor at the National Cancer Institute, Bethesda, Maryland. He received his Ph.D. from the University of California, Berkeley in 1984. He is currently a senior research advisor at the National Cancer Institute, Bethesda, Maryland. He is also a senior research advisor at the National Cancer Institute, Bethesda, Maryland.

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ems.mit.edu/apply.php

Applications are due by **Midnight on November 1st**.

Questions? Contact Jennifer Young (Class Officer):
jyoung09@mit.edu

Safety at Reactor Lab Being Inspected

Reactor, from Page 1

is issued approximately 30 days after completion of the inspection. The average American citizen receives approximately 0.36 rem per year from the environment, medical X-rays, and other day-to-day sources, according to an NRC fact sheet. About 50 rem can decrease the red blood cell count. Licensed to operate in 1958 by the Atomic Energy Commission, NRC's predecessor, the MIT Nuclear Reactor Laboratory conducts research in the fields of nuclear energy systems, nuclear science, nuclear medicine, and radiation science and technology.

Solution to Crossword

from page 7

INDELICATE	HERE
MAURITANIA	AVES
AMENGORNER	STMP
GENTE	MISLEADER
ERNE	EEK
SSA	ULAH
CSA	SEP
STREETSOFLAREDO	
CHE	ERR
REGAN	AERIE
ABACUS	NED
PRIESTESS	ALATE
PINA	ANTIPROTON
EDEN	STALEMATES
REDS	HOMEREMEDY

Solution to Sudoku

from page 7

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BELLONA

MIT research reactor incident exposes worker, NRC says

Part of: [Nuclear USA , Bilateral Programmes](#)

BOSTON - The Massachusetts Institute of Technology (MIT) was cited for two violations at its nuclear research reactor after a worker was exposed to a startlingly high dose of radiation in October, federal inspectors with the US Nuclear Regulatory Commission said in interviews Friday.

[Charles Digges, 21/12-2007](#)

Thought the incident was rated as "not serious" by regulators, it points to the leitmotif of dangers associated with research reactors and the relative independence from strict safety guidelines that their commercial counterparts are forced to adhere to.

One of the most prestigious technological universities in the world, MIT's campus is located on the banks of the Charles River in Cambridge, Massachusetts and surrounded by an urban population of more than 2 million in the Boston area. The MIT reactor is the second largest research reactor in the United States, second only to the research reactor at the University of Missouri, Columbia.

A special NRC inspection triggered by the irradiation of the worker found the MIT had fallen short in making reasonable checks to assess the scale and extent of radiation levels present in work areas surrounding the 49 year old research reactor as required by NRC regulations, said agency spokesman Neil Sheehan.

MIT also failed to provide the injured worker adequate safety training as required for all employees who are likely to receive a dose of more than 100 millirems of radiation exposure in a year, Sheehan said.

Worker in good condition, but information sparse

The university would not immediately release the name or position of the exposed worker, but a spokeswoman for the press office said the worker had recovered from the incident.

MIT's Nuclear Reactor Laboratory Director David Moncton, who is authorised to comment further on the incident, had not returned Bellona Web phone messages by this printing. An update will be issued if Moncton can be reached.

The failings leading to the radiation exposure incident are listed in the NRC report as Severity Level IV violations, said Sheehan, which is a category reserved for incidents of very low safety significance.

History of the incident

On October 17th, MIT reported that one of the reactor's operators had a radiation measurement of more than four rems for the period between July 1st and September 30th.

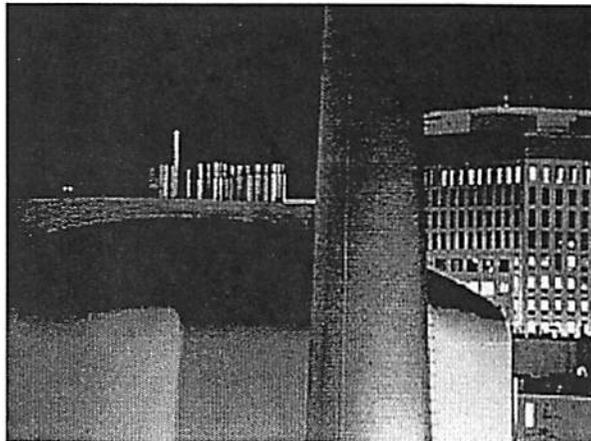
That accounts for more than 80 percent of the total radiation that a worker can be safely exposed to during an entire year, said Sheehan. All other employees' radiation exposure measurements for the same time period were normal, he said.

"The NRC inspection team noted various weaknesses" in MIT's program to monitor radiation levels, according to the NRC report released Thursday, which also described the school reaction to the high radiation exposure as "prompt, comprehensive, and technically sophisticated."

The school notified its own safety officials and the federal commission.

"The university will have to respond to the violations" within 30 days, Sheehan said. "We will use that information to determine whether further enforcement action is necessary to ensure compliance with agency requirements."

Dangers of research reactors



MIT's research reactor.

web.mit.edu

Related articles

[United State Global Threat Reduction Programme takes giant steps, NNSA says \(10/10-2008\)](#)

[Global Threat Reduction Initiative repatriates Russian HEU from Czech Republic\(11/12-2007\)](#)
[Washington and Moscow agree to repatriate Russian-origin HEU from 17 countries\(27/05-2004\)](#)

[Norwegian radiation authorities issue lightning fast permit for reactivation of a leaking reactor \(31/01-2004\)](#)

[Norway imports Russian uranium\(13/05-2002\)](#)

Research reactors, including the one at MIT are much smaller in size than their commercial counterparts that are used for energy production. But they deal with atypical fuels and many produce highly enriched uranium and plutonium – which depending on institutional security can pose high safety and proliferation risks.

Sheehan identified MIT's reactor as an HWR reflective type reactor. This, said Niels Bøhmer, Bellona's nuclear physicist, means it is a heavy water reactor running on uranium and capable of producing both weapons grade uranium and plutonium.

MIT's five-megawatt reactor, which went online in 1958, uses weapons grade, highly enriched uranium as fuel, according to the University's newspaper, The Tech

Poor training at research reactors, Bøhmer is a problem of international scale, as are general safety problems for workers.

"The management of these reactors tends to be ad-hoc and they are typically old and lack more modern safety features of commercial power plants," said Bøhmer.

"When viewing incidents at research reactors at an international level, what happened at MIT – as constituted by an IAEA report on research reactors – is a typical incident."

Bøhmer noted that the report on research reactors worldwide by the IAEA cited fire safety violations and high vulnerability of workers to irradiation as their chief dangers, given that each research reactor is tended to by individual institutions that often do not have or observe codified national nuclear safety codes.

"And such safety codes are hard to nail down by the very nature of the reactors. Is for experimental purposes," said Bøhmer. "They deal with new combinations of fuel – not always safe."

In the United States, said Sheehan, all research reactors fall under the purview of the NRC, and said he was "sure there had been other incidents" at the MIT reactor, given it's age.

Nuclear proliferation

Nuclear proliferation is also another danger of research reactors, and have been identified by the IAEA and Bellona. Primary among these dangers is the fact that HEU is stored in universities and research institutes as opposed to fortified military compounds, making the fuel far more vulnerable to terrorist seizure.

Nuclear Reactor Laboratory Director David Moncton told The Tech in a 2005 interview that the MIT reactor has at most two kilograms of fresh HEU on site at any time - a small fraction of what is needed for a bomb. He said the fuel is delivered on a just-in-time basis, so that the reactor does not need to stockpile fuel, the newspaper reported.

To mitigate the dangers of at least Russian origin HEU at research reactors throughout the world, the United States, Russia and the IAEA signed off on the Global Threat Reduction Initiative to repatriate Russian origin HEU from 20 reactors in 17 countries.

The programme is moving successfully, and last week, the Czech Republic sent some 80 kilograms of HEU back to Russia for storage and eventual reprocessing.

As the agency responsible for overseeing safety at research reactors in the United States, the NRC's Sheehan said that the post 9/11 world had seen serious upgrades to security at US research reactors. He said this included 24-hour surveillance patrols, NRC safeguards and strict access restrictions, but refused to disclose further details about security at the MIT reactor.

Recent incidents at MIT's reactor

The last recorded incident of a notice of violation sent to MIT regarding the use of its experimental reactor by the NRC was dated October 2003 of a July 2003 incident during which a reactor operator was found asleep at the controls.

MIT was assessed a \$5,500 fine for the incident, and it was assigned a Severity Level III violation by the NRC.

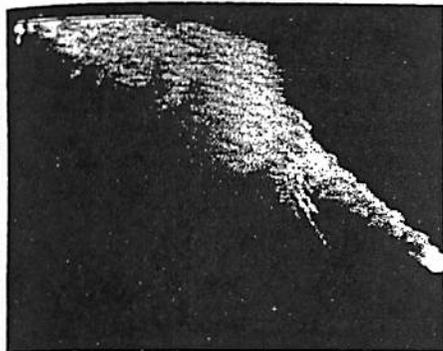
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Shuttle explodes moments after launch

MIT grad McNair among seven presumed dead



The space shuttle Challenger seconds after the explosion.

By the Tech staff
Ronald E. McNair PhD '76 was among seven astronauts who died when the space shuttle Challenger exploded minutes after its launch from Florida's Kennedy Space Center yesterday morning. The crew included Air Force Maj. Francis R. Scobee, the shuttle commander; Navy Cmdr. Michael J. Smith, pilot; Dr. Judith A. Resnick, mission specialist; McNair, mission specialist; Gregory B. Jarvis, payload specialist; Air Force Col. Ellison S. Onizuka, mission specialist; and Christa McAuliffe, payload specialist.

Text of President Ronald Reagan's eulogy of Challenger's crew, Page 9.

American astronaut in space, did his graduate work in physics at MIT's Spectroscopy Lab.

McAuliffe had been selected by the National Aeronautics and Space Administration (NASA) Teacher in Space Program from over 11,000 applicants to become the first private citizen in space.

The shuttle lifted off flawlessly at 11:38 am, apparently unaffected by the equipment problems

that had earlier plagued Challenger and caused a launch delay.

One minute and 12 seconds into the flight, Scobee notified Mission Control: "Roger, go to throttle up," signifying the application of full throttle, and maximum stress, to the Challenger. This transmission was the last heard from the shuttle.

The unused, highly-explosive (Please turn to page 3)



Ronald E. McNair PhD '76.

Photo courtesy NASA

MIT reacts to shuttle crash

By the Tech staff
Yesterday's crash of the space shuttle Challenger will set back the National Aeronautics and Space Administration's (NASA) shuttle program by "anywhere

from six to twelve months," said Joseph H. Binsack PhD '66, associate director of MIT's Center for Space Research (CSR).

Several other researchers at MIT responded similarly. CSR

Director Gordon H. Pettengill '48 predicted that NASA will not launch any more space shuttles until it determines the cause of the accident.

NASA will probe for a good explanation of what caused Challenger to explode, Binsack said. Once NASA has identified the source of the explosion, it will search for a way to ensure that such an incident does not happen again, he continued.

"No one in their right mind would go ahead with the space program without analyzing the data and coming up with some very good hypothesis of what happened," Binsack said.

NASA had planned 15 shuttle missions for this year. It will probably cancel all of the missions in the next couple of months, Binsack said.

Binsack and Pettengill would not speculate on what might have caused the apparent explosion of the Challenger's main fuel tank. "We don't get involved with the propulsion systems," Pettengill said.

"We've been watching the films just like everyone else," Binsack added. "There's just a lack of information so far."

George L. Sarver III G, a student at the MIT Space Systems Laboratory, said he and his col-

(Please turn to page 8)

Cambridge evaluates MIT's nuclear reactor

By Earl C. Yea
An ad hoc committee appointed by the Cambridge City Council has begun a safety investigation of MIT's nuclear reactor, according to David B. O'Connor, director of the city's Department of Emergency Management and

member of the committee.

"There's been an increase in international terrorism, and in light of world events, the study is an excellent idea at this time," O'Connor said.

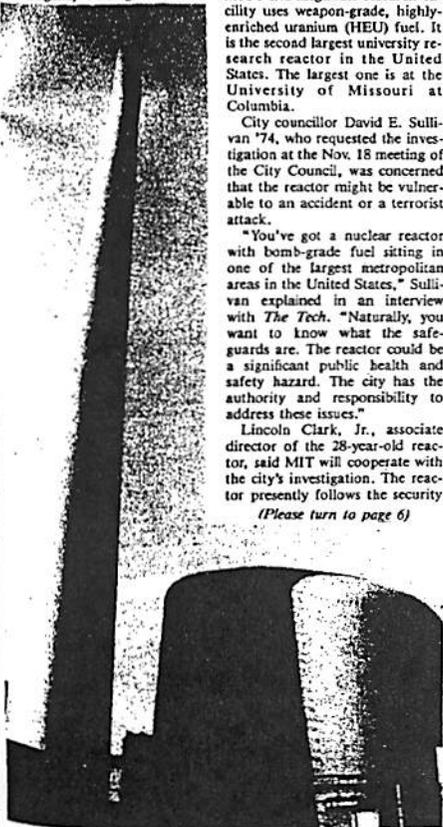
Located at 138 Albany Street, MIT's five-megawatt research facility uses weapon-grade, highly-enriched uranium (HEU) fuel. It is the second largest university research reactor in the United States. The largest one is at the University of Missouri at Columbia.

City councillor David E. Sullivan '74, who requested the investigation at the Nov. 18 meeting of the City Council, was concerned that the reactor might be vulnerable to an accident or a terrorist attack.

"You've got a nuclear reactor with bomb-grade fuel sitting in one of the largest metropolitan areas in the United States," Sullivan explained in an interview with *The Tech*. "Naturally, you want to know what the safeguards are. The reactor could be a significant public health and safety hazard. The city has the authority and responsibility to address these issues."

Lincoln Clark, Jr., associate director of the 28-year-old reactor, said MIT will cooperate with the city's investigation. The reactor presently follows the security

(Please turn to page 6)



Tech photo by Mike Klug

MIT's research nuclear reactor on Albany Street.

Ronald E. McNair

Ronald E. McNair PhD '76 is one of seven astronauts believed killed in yesterday's crash of the space shuttle Challenger. McNair, who came to MIT as a Ford Foundation fellow, specialized in chemical and high-pressure carbon dioxide lasers. He performed some of the earliest experiments in laser spectroscopy; Michael S. Feld '63, his thesis advisor, now directs the Spectroscopy Lab where McNair completed his graduate work in physics.

An interview with McNair about the personal growth involved in meeting challenges appears on page 19.

Originally from Lake City, SC, McNair earned a bachelor's degree in physics from North Carolina A&T State University in 1971, where he was a Presidential Scholar. He spent his junior year with the MIT physics department through a special MIT exchange program.

McNair joined the physics staff of the Hughes Research Laboratories after leaving MIT. The National Aeronautics and Space Administration selected McNair as an astronaut candidate in 1978, and he completed his training in 1979.

He made his debut in space on Feb. 3, 1984, as a mission specialist on board Challenger Flight 41B. The crew tested the jet backpacks used to repair the Solar Max satellite last year, and McNair controlled the shuttle's mechanical arm which aided in the testing. He was the second black American in space.

McNair held a fourth degree black belt in karate and played saxophone for a jazz band.

He is survived by his wife, Cheryl Moore, and his son Reginald, who will be four next month. He was 35 years old.

Group revises pornography policy

By Andy Flsh

First of two parts.

An advisory committee has proposed a revision of MIT's policy on sexually explicit films which would exempt educational presentations from the policy's restrictions and change the composition of the pornography screening committee.

The draft is only an intermediate step in the revision process, according to Janine M. Nell G, president of the Graduate Student Council and member of the advisory committee. The GSC and the Undergraduate Association (UA) are sponsoring a Feb. 5 forum to discuss the proposed policy.

UA President Bryan R. Moser '87, another member of the advisory committee, emphasized that the proposal "could completely change" following the forum. The UA and GSC would revise the policy based on student input, he said. "The new policy is coming from the students."

The group which proposed the revisions included Nell; Moser; Finley R. Shapiro G and Associate Professor of French Isabelle de Courtivron, members of the Committee on Student Affairs; Campus Activities Advisor Barbara M. Fienman; and Dean for Student Affairs Shirley M. McBay.

The present policy, created by the Office of the Dean for Student Affairs in August, 1984, provided for a committee to screen all x-rated or unrated sexually explicit films prior to public showing on campus.

Proposed changes

The advisory committee recommended several revisions.

● Composition: The statement alters the screening committee's composition by (1) removing explicit membership of student groups such as the Lecture Series Committee and (2) mandating equal representation of men and women. The screening committee

has consisted of three LSC members, three other students, three faculty members, and three staff members.

There would no longer be any positions reserved for LSC members. (Please turn to page 7)

inside

Does Paul Gray listen to you? Page 2.

Hayden Gallery laid bare. Page 11.

The crystalline song of the ice princess. Page 12.

Tracksters got sweet, revenge after three years. Page 22.

Council fears uranium theft

(Continued from page 1)
arrangements required by the Nuclear Regulatory Commission (NRC), he added. The Council has the right to ensure that MIT takes sufficient safety precautions, he said.

"Cambridge has always been interested in the safety of the reactor," Clark explained. "People have been brought up to be concerned about nuclear reactors, but we are convinced that the reactor will not cause a safety problem to the general public."

An accident-caused leak of radioactive material would be extremely unlikely to spread beyond the reactor building, he indicated.

O'Connor explained, however, that the committee is more concerned with the possibility of theft or sabotage to the reactor rather than the safe operation of the reactor. "The real issue is the physical security [of the reactor]," he said.

Sullivan questioned whether the reactor has adequate security to stop a determined terrorist. "If a terrorist wanted to strike somewhere in this area, the nuclear reactor at MIT would be a good place to start," Sullivan proposed in the November 1985 *Boston Magazine*. "Right now, if somebody wanted to drive a truck loaded with a bomb up to the reactor, what's to stop them?"

The building containing the reactor is protected by a two-foot wall of steel-reinforced concrete, according to Clark. In addition, the core of the reactor, the unit in which nuclear reactions take place, is further surrounded by a five-foot concrete enclosure, Clark said.

"If someone ran into the building with a bomb, that would damage the wall, but that's about it," Clark said. "Radioactive material wouldn't escape."

Critics concerned with HEU theft

Daniel Hirsch, director of the Adlai Stevenson Program on Nuclear Policy at the University of California, claimed that HEU stored at university research reactors is particularly vulnerable to theft. Campus police are trained for routine patrol situations, not for "preventing theft of material that can be used to make nuclear weapons," he told *Boston Magazine*.

The MIT Campus Police maintains 24-hour surveillance of the facility with armed patrols conducting periodic checks on the reactor, Clark said. Access to the facility is limited to people participating in an experiment and those involved with the reactor's maintenance and operation, he added. All other visitors must be escorted, he continued.

MIT police officers responsible for patrolling the reactor receive additional training, according to MIT police officer Ted Lewis. The special training, which is jointly designed by reactor officials and the MIT police chief, mainly focuses on the safe handling of radioactive material, he added.

Could terrorists build bomb?

Building a nuclear weapon requires somewhere between 10-20 kilograms of HEU, depending on the level of uranium enrichment, according to Bernard T. Feld, professor of physics.

The MIT reactor is permitted to store up to 29 kilograms of HEU, according to Clark. But most of the HEU fuel is radioactive and therefore difficult to steal.

"All but 1.5 kilos [of uranium] are radioactive," Clark explained. "So the fuel's mostly self-protecting."

Feld agreed that handling radioactive fuel directly out of the reactor would most likely be a

fatal. Terrorists could steal radioactive fuel only if they have a "relatively sophisticated remote control system" or if they are willing to commit suicide, he explained.

But Hirsch contends that even small amounts of bomb-grade material are dangerous in the wrong hands. "The easiest precaution is to replace the fuel with lower grade uranium that can't be used for a weapon," Hirsch said.

Clark: HEU needed for research

The MIT reactor is used for a wide range of research experiments in fields such as medicine, geology, nuclear physics, and radiochemistry, Clark described.

The facility also produces large quantities of isotopes, mainly for medical applications. For example, the Harvard Medical School is using an MIT-produced radioactive isotope to develop an arthritis treatment, he said. The reactor also puts radiation in gold seeds which are used for treating brain cancer patients in Boston-area hospitals, he added.

The reactor would be shut down if it were restricted to using low or medium-enriched uranium, Clark said. The lower the enrichment of the uranium, the bigger the reactor must be in order to accommodate a nuclear reaction.

"MIT's [reactor] was built for high-enriched uranium," Clark indicated. "If we had to go to low-enriched uranium, it would mean that we have to rebuild the reactor."

Physics laboratories in the United States are currently exploring the possibility of using low-enriched uranium for producing a fission reactors for use in research reactors similar to MIT's, Clark explained.

"When such a fuel is available, we would be glad to use it," Clark said. "It would be an expensive proposition, but we would do it if required."

NRC security slows investigation

The ad hoc committee is presently studying NRC regulations governing the storage of HEU for university research reactors, O'Connor said. The committee only recently received permission from the NRC to examine these regulations, O'Connor said.

The committee plans to inspect the reactor upon completion of its study of the regulations, he added. An NRC representative will be required to accompany the committee when it visits the reactor, he remarked.

"The federal regulations, quite wisely, restrict the dissemination of NRC information," O'Connor explained. "I think that that [the security] is quite appropriate."

The fact that the city is studying the reactor does not necessarily mean that MIT has been negligent in its reactor protection. "It's an opportunity for MIT to ensure better communication and cooperation with the city. We're here to help. We're here to work with them," he said.

O'Connor estimated that the study will take two or three months. "We want to look at things carefully and come back with a complete report," he said. "We don't want to include self-defeating information that would publicize MIT's security precautions," he added.

The other members of the committee are: Thomas Scott, Cambridge Fire Chief; Henry Gallagher, Cambridge Acting Police Chief; Melvin H. Chalfen, Cambridge Health Commissioner and MIT physician.



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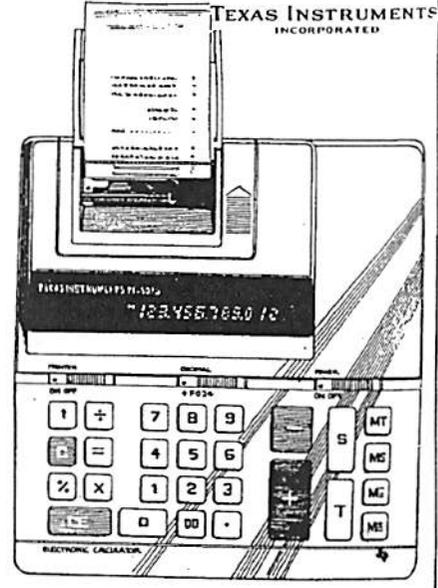
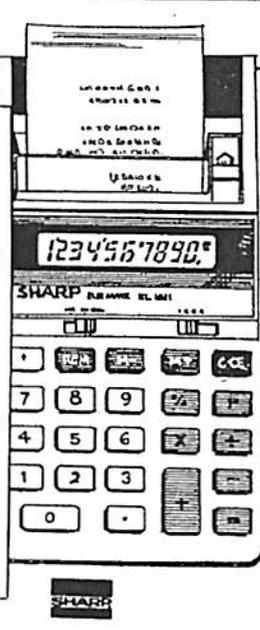
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