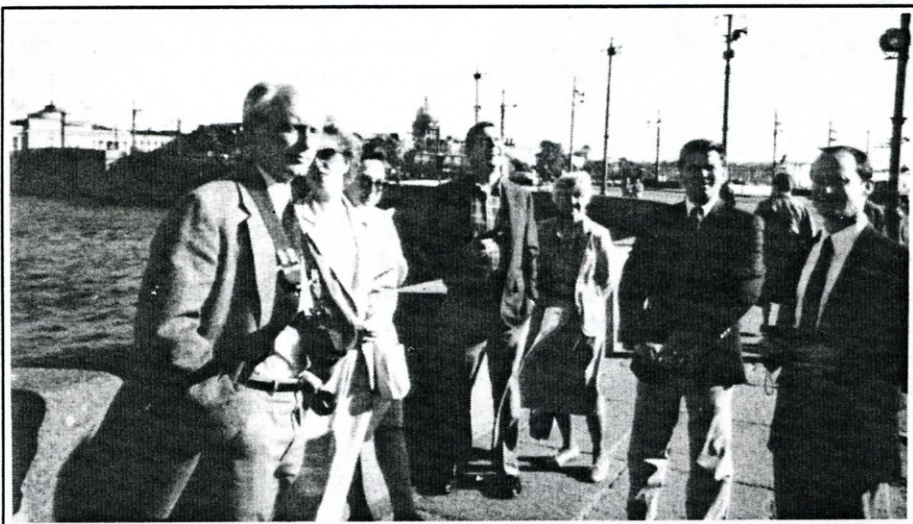


US/USSR CIT Dialogue

DOE Lauds PPPL Preparation

by Phyllis Rieger



(PHOTO BY MILT MACHALEK)

Standing on the banks of the Neva River are: (l to r) Tip Brolin, Anne Young, Ludmila (translator), Charlie and Judy Bushnell, Tom James and Rick Temkin.

Possible Soviet contributions to the Compact Ignition Tokamak (CIT) Project were explored at US/USSR discussions during the week of June 12-18 in Leningrad and Moscow.

Thomas R. James, US Department of Energy CIT Program Manager, headed a US delegation of Tip Brolin, Milt Machalek, Charlie Bushnell, Dan Huttar and Ken Young, with R.J. Temkin of the Massachusetts Institute of Technology (MIT). They traveled to the Soviet Union to continue a dialogue that began in December 1986 when a USSR delegation first visited the US to exchange technical information on ignition planning progress and design studies.

The June meeting is the 4th dialogue to explore possible US/USSR technical exchanges on ignition and specifically, the CIT program. Discussions focused on possible candidate areas for USSR participation in CIT. One possibility is the USSR

contributing hardware (for example, fly-wheel-generator sets and associated power supplies) for CIT. At the same time, the trip provided the US delegation with the opportunity to evaluate the USSR's design, fabrication and manufacturing capabilities. In fact, US participants were allowed to tour the Elektrosila Works where large generators are produced. The Soviets are historically quite secretive about showing foreigners their facilities in heavy industry.

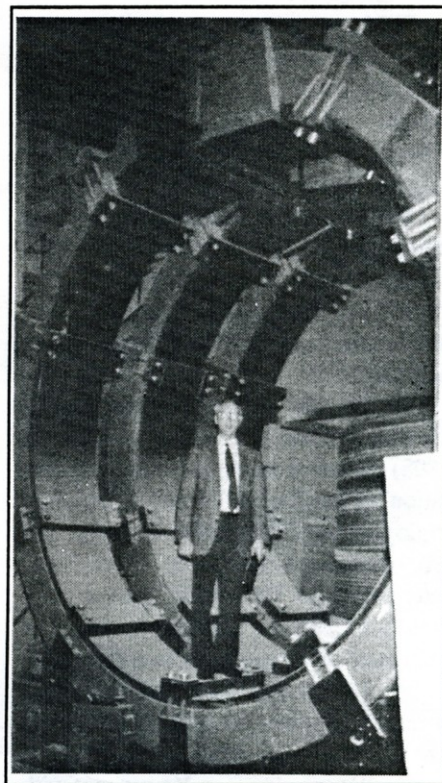
Successful Dialogue

"Quite successful," is how Milt Machalek described the collaboration dialogue. "Of course this trip is only one step of many involved in possible joint US/USSR efforts," emphasized Milt who said, "The Soviets exhibited enthusiasm and were responsive to answering our questions. It was a very informative discussion."

He outlined the group's week-long discussions which began with formal presentations by the US delegation in Leningrad on June 13th. "All formal discussions took place at the House of Scientists of the Academy of Sciences," said Milt who explained the "House" is literally an old palace.

CIT Status Report

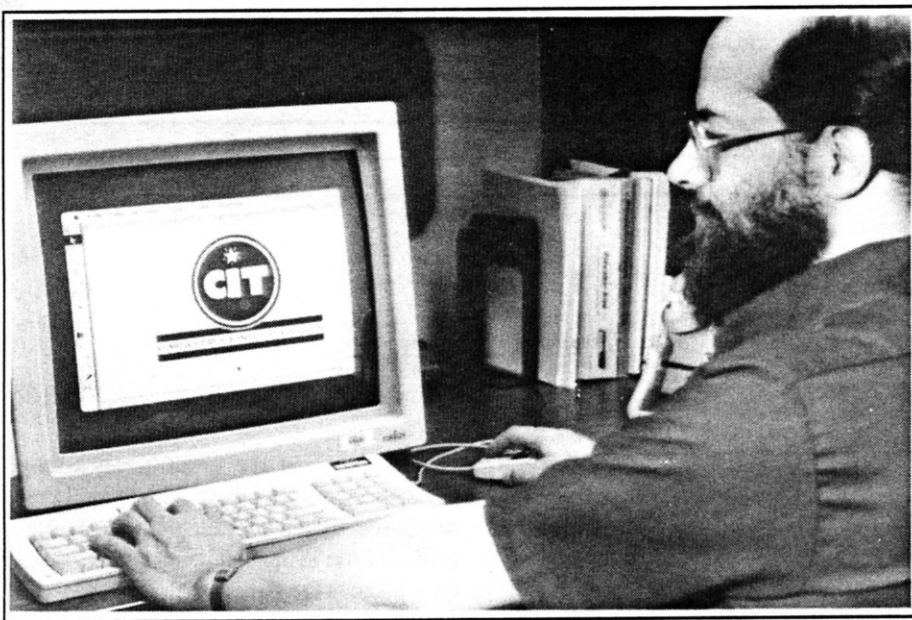
Discussions kicked off with a general status report of CIT given by Tip Brolin, followed by Charlie Bushnell outlining the CIT research and development program. Dan Huttar gave an overview of the



(PHOTO BY MILT MACHALEK)

Tip Brolin stands inside spare of the inductive energy storage coils for TSP (T-14) tokamak.

(continued)



(PHOTO BY DIETMAR KRAUSE)

PPPL's computer specialist Andy Baird designed viewgraphs used for PPPL presentation in both English and Russian.

electrical power system requirements and conceptual design. Dan's presentation highlighted the need to augment the PPPL site energy supply and power conversion systems for full power operation of the CIT. During the afternoon several Soviet presentations were made.

PPPL participants used viewgraphs which were designed by PPPL's Andy Baird and which featured both English and Russian translations. PPPL's John Boychuk prepared the Russian translations for the viewgraphs.

Milt said, "We perceived the Soviets appreciated this special effort." He also explained most Soviet scientists speak English but discussions were consecutively translated into English and Russian during the week.

On Tuesday the group visited the Elektrosila Works, the largest and oldest (1898) electrical machine building "association" or "collective" in the USSR which employs over 10,000 people and produces turbo-generators in the range of 60 megawatts (MW) to 1200 MW. Following a brief factory tour a detailed review was conducted of a proposed two-flywheel-per-generator design for CIT. Discussions on electrical power for the CIT continued during the next two days.

On Wednesday Ken Young met with a group of about 20 Soviet diagnosticians. After his talk and 13 separate Soviet pre-

sentations and many informal conversations, an agreed summary of the diagnostic discussions was written. Other discussions during this time centered on electron cyclotron resonant heating with Rick Temkin of MIT.

Some of the delegation visited the A.F. Ioffe Physical-Technical Institute of the USSR Academy of Sciences. There is a strong diagnostic group there specializing in neutral particle analyzers.

On Thursday the group went to the D.V. Efremov Scientific Research Insti-

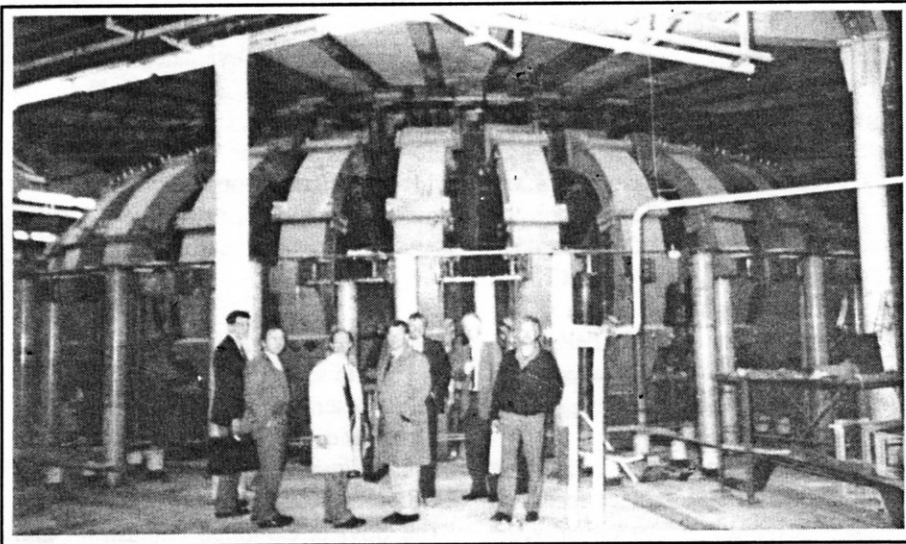
tute of Electrophysical Apparatus, founded by Elektrosila to do research in electrical equipment for scientific applications. The Efremov Institute not only has designed and built large parts of the major particle accelerators in the USSR but has also designed and built much of the large tokamaks in the USSR. In addition, the Efremov Institute carries out research in fundamental and plasma physics. The primary area of fusion physics in this institute is compact tori with the final goal of a reactor-size compact torus. The Record of Discussion of the Exchange was developed and signed by both US and USSR representatives prior to this group's departure from Leningrad.

On To Moscow

Thursday night the US delegation traveled 400 miles to Moscow via the Soviets' Red Arrow high speed train to visit the Troitsk Laboratory, part of Moscow's I.V. Kurchatov Institute of Atomic Energy. Troitsk is a "scientific city" of some 30,000 inhabitants with about 100 physicists employed there. According to Milt, "As far as we know, our delegation was the first, large technical group of Americans to visit the Laboratory."

The reason for the visit was to see the TSP facility, the Soviets' latest tokamak. The TSP experiment, or "Strong Field Tokamak," was previously called T-14. Four flywheel-generators provide stored

(continued)



(PHOTO BY MILT MACHALEK)

Delegation stands in front of TSP (T-14) inductive energy storage coils. The tokamak device sits on top of these coils on the floor above.

energy for the TSP facility, each unit providing 215 MW maximum pulsed power. Two units have been installed, two are still being built. The flywheel-generators are the product of the Elektrosila Works in Leningrad and are similar to ones being suggested for use on CIT as part of a possible US/USSR collaboration. TSP obtained its first plasma 36 hours before the end of calendar year 1987.

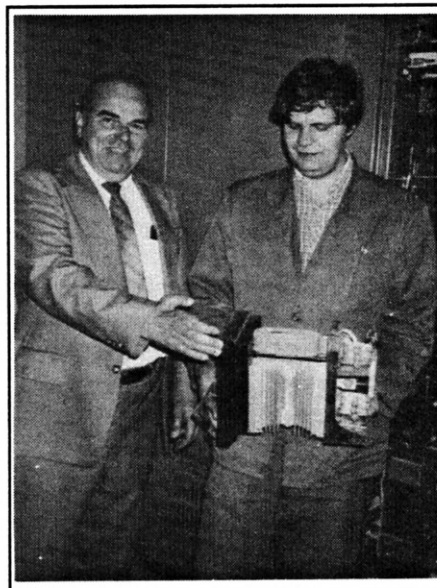
Charlie Bushnell visited the V.I. Lenin Electrotechnical Institute in Moscow and talked about coil design with the Soviets who proposed a new concept of multilayered ribbon coils. He expressed an interest in touring the Institute after he had heard on Monday a Soviet presentation of a paper, "Toroidal Magnetic System Comprised of Multilayered Ribbon Coils." Charlie brought back a copy of the paper, which was later translated into English by PPPL engineer George Levitsky.

Besides the USSR trip, some members of the delegation also visited the Joint European Torus (JET) in Culham, England, and other facilities in Garching, West Germany.

Valuable Insight

Milt said, "We felt the trip offered valuable insight into the future of fusion energy, especially the CIT. It was an exceptionally intense trip with a lot of planning involved. We all felt our trial run presentations at PPPL before we left made our presentations before the Soviets more effective. After the trip Tom James of the US Department of Energy complemented us on our 'excellent leadership' and 'preparation'."

The US and USSR fusion programs continue to explore within their respective governmental structures the acceptability of a pioneering US/USSR CIT collaboration.



(PHOTO BY MILT MACHALEK)

*At Troitsk Laboratory, Dan Huttar examines a thyristor subassembly of a power converter that is used to charge the inductive storage feature of the TSP (T-14) machine. **

Storage Areas Inventoried

In order to effectively keep the lower C-Site storage yard and the gravelled area in the lower C-Site parking lot (A and B, respectively, in the figure) neat and clean at all times, tighter controls and new storage procedures have been established (see below). A one-time review of all items in these areas is being conducted between now and October 1.

Generally, only those areas specifically assigned to "Responsible Area Managers" may be used by them as storage areas. Accordingly, all items in

unassigned areas, such as the gravelled area of the lower C-Site parking lot, will be moved or disposed of in conjunction with the ongoing general review and cleanup of PPPL storage areas. With regards to the lower C-Site storage yard, the following new procedures are now in effect:

- Storage requests for the lower C-Site storage yard must be submitted to Plant Maintenance and Engineering (PM&E). After approval, PM&E will forward the requests to the Materiel Control Office for recording and tracking.
- A periodic inventory of the lower C-Site storage area will be conducted by PM&E, with Materiel Control Office assistance. Any "nonapproved" items found will be disposed of by PM&E.
- Signs will be posted near the lower C-Site storage yard stating the conditions under which items may be stored.

Any questions regarding policy or procedure should be directed to Eileen Rabiger, ext. 2808.



Is Your Phone Extension Listed Correctly?

If your telephone extension is listed incorrectly in the PPPL Telephone Directory, Molly Tompkins would like to know. Molly is located in room B133 at C-Site. She can be reached on extension 2694. *

The PPPL HOTLINE is issued by the Princeton University Plasma Physics Laboratory, a research facility supported by the United States Department of Energy. It is primarily an internal publication. Correspondence and requests to reprint material should be directed to Carol Phillips, Editor, PPPL HOTLINE, P.O. Box 451, Princeton, NJ 08543 or telephone 609-234-2754; Interoffice correspondence should be addressed to Room B366, James Forrestal Campus, C-Site.

Photos screened by Greg Czechowicz.
Layout by Carol Phillips.

Let's Talk Benefits

Periodically, the PPPL Benefits Section will provide the HOTLINE with important information regarding employee benefits. This will include important changes in benefits, reminders about approaching deadlines and open enrollment periods, and general information.

We hope this column will keep you better informed on your benefits. Bobbie Forcier in the Benefits Section is always willing to help you on an individual basis. Call her at ext. 2101 and watch for "Let's Talk Benefits."

Tax Reform Deadlines Approach

After sending your 1987 tax return off to the IRS, you'd think you could forget, for the time being, about the dramatic changes to the tax code wrought by the Tax Reform Act of 1986. But many of these changes are being phased in and go into effect in future tax years. Deadlines for some new provisions are now approaching, and it may be necessary to take action soon to avoid losing tax advantages.

SRA Cash Withdrawals

For the rest of 1988, withdrawals from tax-deferred annuities, including TIAA and CREF Supplemental Retirement Annuities (SRAs), are permitted, but a 10% tax must be paid in addition to the ordinary income tax if the withdrawal is "early" (that is, if it doesn't meet certain conditions, including some of those listed below). Starting January 1, 1989, the new law entirely prohibits a cash withdrawal from a tax-deferred annuity unless you are 59-1/2 or older, separated from the service of your employer, are disabled, withdraw the funds because "hardship" (not yet defined by the IRS), or the money is distributed as a death benefit. If you're considering making a withdrawal from your SRA, contact the TIAA-CREF Benefit

Payment Information Center to obtain the forms (1-800-842-2777); if you decide to make a withdrawal before the new restrictions take effect, the distribution must be made by TIAA-CREF by December 31, 1988. To ensure that your check can be issued by then, all forms, properly completed **should be received by Friday, December 16, 1988.**

It's possible that the rules governing withdrawals will be less harsh than they appear now. As currently drafted, the Technical Corrections Act pending in Congress would permit continued access (subject to the 10% penalty rules) to amounts accumulated in your SRA before 1989.

The Grandfather Rule and the Excise Tax

Some people may be subject to an excise tax, created by the 1986 Tax Reform Act, when they begin receiving income from their retirement plans. This extra tax kicks in if taxable benefits from all tax-favored retirement savings vehicles — including qualified retirement plans, Keogh plans, Individual Retirement Accounts, and tax-deferred annuities — exceed the ceiling established for a particular year. For example, in 1988 a 15% excise tax is imposed on taxable benefits received above \$150,000 or \$117,529 indexed to rise with the Consumer Price Index, whichever is greater in the years benefits are received.

However, anyone who, on August 1, 1986, had more than \$562,500 in tax-favored savings can use a special grandfathering rule included in the Tax Reform Act which might result in a more favorable tax treatment when they receive benefits. But this rule must be elected on a tax return for a tax year ending before January 1, 1989, even if benefits won't be received for several years. In addition, a 15% excise tax is imposed against a person's estate if, in death, there is an excess accumulation (above a maximum determined by the IRS) in these tax-favored retirement savings vehicles. If you believe this rule will affect you, consult your tax advisor to de-

termine whether electing the grandfather rule will be to your advantage.

Also, people already receiving benefits as of August 1, 1986 may still be eligible for grandfathering, if the value of their benefits was more than \$562,500 as of July 31, 1986. The IRS provides a form on which to make the election, and TIAA-CREF can assist you in determining what the value of your TIAA-CREF accumulation was on August 1, 1986.

An IRS Deadline Is Extended

When was the last time you paid attention to a half-birthday? Well, there's one half-birthday that the IRS would like you to pay attention to — 72-1/2. Generally, the Tax Reform Act requires all TIAA-CREF policyholders to begin receiving annuity income by April 1 of the year following the year they turn 70-1/2. Starting January 1, 1989 policyholders are subject to severe tax penalties if they fail to start by the required deadline, or if they start but receive distributions below certain minimums specified by IRS regulations.

The IRS has extended one of these deadlines, however. Those who reach age 70-1/2 during 1987 were required to begin benefits by April 1 of this year. Now, the IRS has given policyholders in this category until December 31, 1988 to begin receiving benefits. (This applies only to 403b plans, Princeton's Plan is a 403b Plan.) Those who fit this category should contact TIAA-CREF's Benefit Payment Information Center (1-800-842-2777) to obtain the forms necessary to begin income by the end of the year.

Aside from the extension, as this new tax provision is being phased in it involves some complicated transition rules. If you have not started receiving annuity income and are approaching age 70-1/2, or are already 70-1/2, please call the Benefit Payment Information Center to find out how they apply to you.

(Information reprinted from The Participant, August 1988, a TIAA-CREF publication.) ♦

Can You Help Bob?

Bob Reed is looking to ride with someone from the Burlington area starting October 1. Bob is on second shift — 4:00 p.m. to 12:00 midnight. He can be reached at PPPL ext. 3444 or his home number, 386-7139.