

Originally Processed With FOIA(s):
2005-0336-F

FOIA Number:
2005-0336-F

FOIA MARKER

**This is not a textual record. This is used as an
administrative marker by the George Bush Presidential
Library Staff.**

Record Group/Collection: George H.W. Bush Presidential Records
Collection/Office of Origin: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files

OA/ID Number: 62043
Folder ID Number: 62043-004

Folder Title:
Physical Science: Energy [1 of 2] [1991]

Stack:	Row:	Section:	Shelf:	Position:
	0	0	0	0

"Document Control"

TYPE: INFORMATION

DOCUMENT NUMBER: 9125218

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: DECKER, Douglas A.: JOHNSON CONTROLS

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 12/20/91

SUBJECT: RE: DR. BROMLEYS INABILITY TO ATTEND THE JOHNSON
CONTROLS ENERGY CONSERVATION FORUM. THEY ARE
PROVIDING HIM WITH THE MATERIALS DISTRIBUTED AT THE
FORUM.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS:

OSTP RECEIVED: 12/23/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES-ENERGY

CENTRAL FILES:

Johnson Controls, Inc.
Controls Group
507 East Michigan Street
Post Office Box 423
Milwaukee, WI 53201-0423
Tel: 414/274 4000

5218I

RECEIVED

91 DEC 23 P 3: 49

JOHNSON
CONTROLS
MAIL ROOM

MAIL ROOM

The Honorable D. Allan Bromley
Assistant to the President for Science
and Technology
The White House
Washington, D.C. 20500

December 20, 1991

Dear Mr. Bromley:

We sincerely regret that you were unable to attend the Johnson Controls Energy Conservation Forum on October 28. As an update, enclosed are copies of the materials that were distributed at the event. Excerpts from Dr. Schlesinger's luncheon speech are also included.

The forum was an unqualified success, and initial reports are that it was very beneficial to all participants.

With the President's recent signing of the Executive Order on Federal Energy Management, which affects all federal agencies, we all agree that significant progress has been made in addressing federal energy efficiency. This is an important first step. However, significant challenges remain concerning its implementation.

The Administration's support of our industry/government coalition advocating federal energy conservation is instrumental to its continuing success.

If you have any questions or require additional information concerning the forum, please do not hesitate to contact us directly.

Best wishes for the holiday season.

Sincerely,

JOHNSON CONTROLS, INC.

Douglas A. Decker
(encl)

Douglas A. Decker, P.E.
Business Development Manager

Encl.

JOHNSON
CONTROLS

Encoding Vol

TYPE: INFORMATION

ORIGINATOR: 02

"Document Control"

STATUS C

DOCUMENT NUMBER: 9124600

DIRECTORATE STATUS

FROM: HURT, Nathan H.: AMERICAN SOCIETY OF MECHANICAL ENGINEERS

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/29/91

SUBJECT: RE: THE SOCIETY'S POSITION ON THE "NATIONAL ENERGY
SECURITY ACT OF 1991".

DIRECTORATE
ASSIGNED:

STAFF
ASSIGNED:

ACTION
REQUIRED:

STAFF
ACTION:

OSTP DUE DATE:
DATE COMPLETED:

SENDER'S DUE DATE:

STAFF DUE DATE
DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES
NATIONAL SECURITY
INDUSTRIAL

Carl Bretscher

WHITE HOUSE TRACKING #:

CONTACT PERSON:
PHONE:

EXT:

REMARKS:

OSTP RECEIVED: 10/31/91 DEPT RECEIVED
FILE: P-PHYSICAL SCIENCES-ENERGY

CENTRAL FILES:

11/8
Dear P-100
Please draft a
reply for DAB's signature
(a la "we supported
S. 1220 and regret its
demise")
Thanks
Karl

Gally

Could you see to it
that this gets
taken care of?

Thanks

Don Ryan

4600

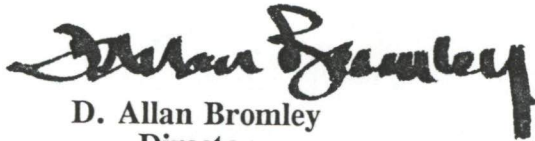
EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

November 18, 1991

Dear Mr. Hurt:

I appreciate your letter of October 29 and share much of your view on the energy policy legislation introduced by Sens. Johnston and Wallop. As you know, the Administration strongly supported this bill and regrets its demise.

Sincerely,



D. Allan Bromley
Director

Nathan H. Hurt, P.E.
President
The American Society of Mechanical Engineers
Suite 906
1828 L Street, N.W.
Washington, D.C. 20036-5104

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9124600
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: HURT, Nathan H.: AMERICAN SOCIETY OF MECHANICAL ENGINEERS

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/29/91

SUBJECT: RE: THE SOCIETY'S POSITION ON THE "NATIONAL ENERGY
SECURITY ACT OF 1991".

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley Carl Bretscher
PHYSICAL SCIENCES
NATIONAL SECURITY
INDUSTRIAL

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS:

OSTP RECEIVED: 10/31/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES-ENERGY
CENTRAL FILES:

4600



The American Society of
Mechanical Engineers

RECEIVED

October 29, 1991

91 OCT 31 AIO: 14

Suite 906
1828 L Street, N.W.
Washington, D.C. 20036-5104
202-785-3756

Dr. D. Allan Bromley
Office of Science and Technology Policy
Old Executive Office Building
17th Street & Pennsylvania Avenue, N.W.
Washington, DC 20500

OFFICE OF THE
DIRECTOR

Dear Dr. Bromley:

The Senate will shortly be taking up consideration of S.1220, the "National Energy Security Act of 1991," introduced by Sens. Bennett Johnston (D-LA) and Malcolm Wallop (R-WY). Though imperfect, this comprehensive bill can provide the necessary framework for creation of a workable national energy strategy and deserves vigorous debate rather than a threatened filibuster.

Increasing dependence on foreign oil and the rebirth of OPEC as a political force threatens this nation's long-term energy security. To deal with this threat, the United States needs a national energy policy.

The American Society of Mechanical Engineers (ASME), in testimony and statements presented previously to Congress, urged that the federal government adopt a national energy strategy to guide our country's near- and long-term energy policies. We see the President's proposed National Energy Strategy, together with the Johnston-Wallop bill, as the first chance in more than a decade for Congress to produce a comprehensive, long-term energy policy for the nation.

We recognize that many areas of S.1220 remain contentious, and ASME does not endorse all elements of the bill. However, the bill's provisions can serve as the means to develop a legislative direction for an energy policy that ultimately balances enhanced energy production strategies (including increased use of renewable energy sources as well as development of indigenous resources) with a national program to reduce energy consumption. In addition, any meaningful policy must balance long-term energy security with preservation of the environment.

We urge you to support expeditious consideration of S.1220, and to work with the House of Representatives so that a comprehensive energy policy can be sent to the President for his approval.

The ASME as a knowledgeable technical resource stands ready to help policy makers assess the potential impacts of the provisions of the proposed legislation.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Nathan H. Hurt', is written over a light blue horizontal line.

Nathan H. Hurt, P.E.
President

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9124613
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: RODGER, Alan S.: GEOSPACE COUPLING GROUP, BRITISH ANTARCTIC
SURVEY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/25/91

SUBJECT: RE: HIS VIEWS REGARDING THE PROPOSED MOVE OF THE
GEOPHYSICS LABORATORY.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 10/31/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES-GEOPHYSICS
CENTRAL FILES:

4613
11 Fairway
Girton
Cambridge
CB3 0QF
UK.

RECEIVED

91 OCT 31 A10:13

OFFICE OF THE
DIRECTOR

Dr D Allan Bromley
Assistant to the President for Science and Technology
Office of Science Technology Policy
Old Executive Building
17th Street and Pennsylvania Avenue NW
Washington
DC 20506
USA

25 October 1991

Dear Sir

I believe that the US Air Force is considering refocussing and relocating the division involved in basic and applied geophysics research to New Mexico. I thought that you might like a few personal observations made by an independent and unbiased observer.

1. The Requirement for Solar Terrestrial Physics (STP) Research

I believe that STP research still has a crucial role to play in many areas critical to military work such as in communications (ground to ground and ground to satellite), global positioning and the lifetime and general well-being of satellites. We are still quite a long way from being able to predict the detailed geospace environment in a particular place at a specific time after a given disturbance upon the sun. However, the STP community has made enormous strides in recent years, and I believe there is a 'new era' of understanding just around the corner. It would be very sad if one of the main players, namely the Air Force, in these studies withdrew support at such a crucial time.

2. The Quality of Research

I have worked in solar terrestrial physics for nearly 20 years. I have been very impressed with the quantity and quality of this work coming into the open literature from the Phillips Laboratory and its previous incarnations. This factor was exemplified to me in the last month as I acted as guest editor a special issue of an international journal. I selected the best people in the various topics to act as referees and find that many of them came from the Phillips Laboratory, and the Laboratory supplied more than any other research organisation.

3. The Effects of the Move

In the UK a decade ago, there was a move to rationalise research establishments with the usual arguments concerning the greater cost-effectiveness provided by the economy of scale. These did not materialise and many of the high quality staff left the organisation rather than move leaving the less able staff still on complement. Even after all this time, I do not believe that the calibre of staff has recovered totally.

I trust that these points will be taken into account when coming to your final decision.

Yours faithfully,

Alan Rodger

Alan S Rodger
Head, Geospace Coupling Group
Upper Atmospheric Sciences Division
British Antarctic Survey

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9124433
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: BISCONTI, Ann S.: U.S. COUNCIL FOR ENERGY AWARENESS

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/07/91

SUBJECT: DR. BISCONTI IS PROVIDING STATISTICS WHICH SHOW
SUPPORT AMONG A MAJORITY OF AMERICANS FOR NUCLEAR
POWER.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES
ENVIRONMENT

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 10/16/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES-ENERGY
CENTRAL FILES:



U.S. Council for Energy Awareness

RECEIVED

91 OCT 16 P 3: 56

4433
Suite 400
1776 I Street, N.W.
Washington, DC 20006-2495
(202) 293-0770

Ann S. Bisconti, Ph.D.

Vice President, Research and Program Evaluation

October 7, 1991

OFFICE OF THE
DIRECTOR

The Hon D. Allan Bromley
Assistant to the President for
Science and Technology
Office of the President
Washington, DC 20506

Dear Mr. Bromley:

A new Gallup poll found that almost three-fourths of Americans (73 percent) believe nuclear energy should play an important role in meeting the nation's energy needs. That's the highest number since the question was first asked and 8 points more than Cambridge Reports found a year ago.

Many Green Consumers (70 percent) agree. Green Consumers — people who call themselves environmentalists and have donated to or been active in a group or organization working to protect the environment — include 27 percent of all adults, more women than men, and large numbers of college graduates.

Almost two-thirds of Americans are now aware that using nuclear energy to generate electricity cuts greenhouse gas emissions, and nearly three-fourths agree we should use more nuclear energy if that is true.

Large majorities in all population groups believe we should use more nuclear energy if that will cut greenhouse gas emissions and air pollution — including 71 percent of men, 70 percent of women, and 66 percent of Green Consumers. Regional support ranges from 66 to 80 percent.

I hope that this information is useful to you.

Sincerely,

Ann S. Bisconti

ASB/cjc

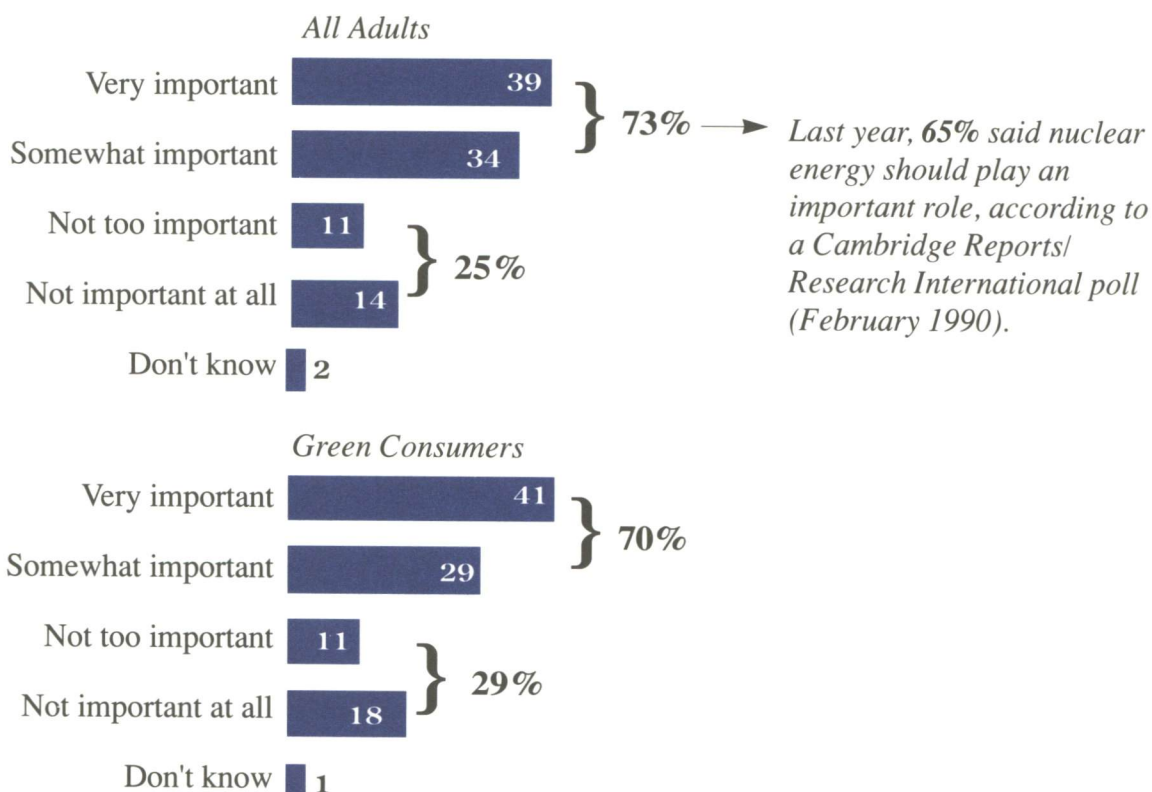
Enclosure

U.S. Public Opinion

Source: The Gallup Organization, July–August 1991, telephone interviews with a nationally representative sample of 1,000 adults. The margin of error is ± 3 percentage points.

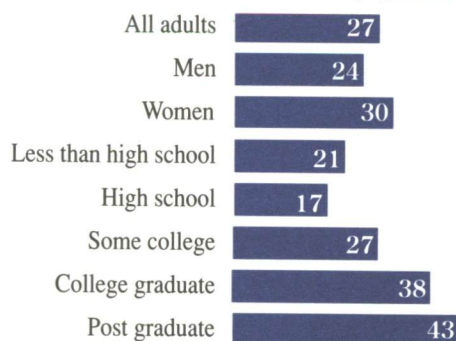
Role nuclear energy should play:

■ "How important a role should nuclear energy play in meeting America's future energy needs?"



Green Consumers are those who identified themselves as environmentalists and have donated to or been active in a group working to protect the environment over the past year.

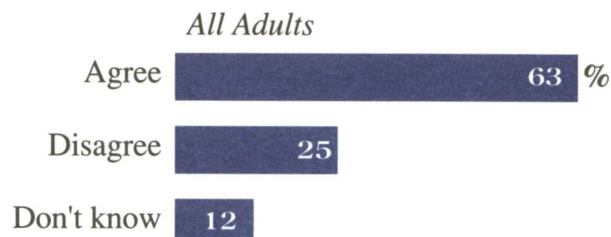
Percent of Green Consumers in each population group:



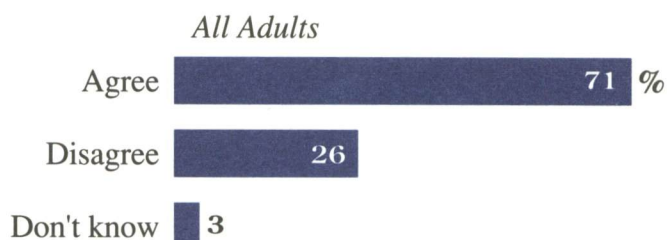
Reducing greenhouse gas emissions and air pollution:

- "I'm going to read you some statements, and I'd like you to tell me, for each one, whether you agree or disagree with the statement."

- ▶ "Using nuclear energy to generate electricity cuts greenhouse gas emissions and air pollution."



- ▶ "We should use more nuclear energy if that will cut greenhouse gas emissions and air pollution."



Percent of population groups who agree we should use more nuclear energy if that will cut greenhouse gas emissions and air pollution:



"Document Control"

TYPE: INFORMATION

ORIGINATOR: 02

STATUS C

DOCUMENT NUMBER: 9124267

DIRECTORATE STATUS

FROM: YAMAGATA, Ben: CLEAN COAL TECHNOLOGY COALITION

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/02/91

SUBJECT: A THANK YOU FOR VISITING AND DISCUSS CLEAN COAL
TECHNOLOGIES.

DIRECTORATE
ASSIGNED: STAFF
ASSIGNED:

ACTION
REQUIRED: STAFF
ACTION:

OSTP DUE DATE: SENDER'S DUE DATE:
DATE COMPLETED: STAFF DUE DATE
DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
INDUSTRIAL
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 10/02/91 DEPT RECEIVED:
FILE: P-INDUSTRIAL*P-P.S.-ENERGY

CLEAN COAL TECHNOLOGY COALITION

1050 Thomas Jefferson Street, N.W. Seventh Floor, Washington, D.C. 20007

RECEIVED

Chairman: R.E. Disbrow
President and COO
American Electric Power Service Corp.

91 OCT 2 AM 11:29

(202) 342-3368
Facsimile
(202) 338-2361
(202) 338-2416

Executive Director:
Ben Yamagata

September 30, 1991

OFFICE OF THE
DIRECTOR

Dr. D. Allan Bromley
Science Advisor to the President
The White House
Washington, D.C. 20500

Dear Dr. Bromley:

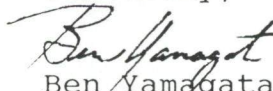
On behalf of Ray Harry of the Southern Company and Robert Beck of the Edison Electric Institute, I want to thank you for taking time to visit with us about clean coal technologies.

I was particularly pleased to know that your office recognizes the beneficial export potential of these emerging technologies. We agree with you that the United States should take the initiative, in light of continuing discussions about global climate change, in promoting the use of those clean coal technologies that are able to achieve high conversion efficiencies thus lessening carbon dioxide emissions.

As I mentioned during our meeting, the electric utility industry and the Clean Coal Technology Coalition are actively advocating programs that will promote the introduction of these new technologies in other countries intending to use coal. One such incentive program has been included in legislation currently under consideration by the House of Representatives Subcommittee on Energy and Power of the House Energy and Commerce Committee. The proposal, originally introduced by Congressmen Bruce, Oxley and others, would permit the on-going clean coal program to locate clean coal technology projects in lesser developed nations so long as U.S. firms, utilizing U.S. technologies, propose and participate in such projects. Creating this type of technology transfer program would enable the United States to confirm our commitment to the use of coal in an environmentally responsible manner. As important, such a program would better insure that these technologies, supported in development by U.S. taxpayer dollars, would be made available by U.S. firms rather than our international competitors. This type of program also would evidence U.S. leadership in global environmental issues.

If we can be supportive of your efforts or if we can provide your office with assistance or information, I would be happy to oblige.

Sincerely,



Ben Yamagata
Executive Director

"Document Control"

TYPE: INFORMATION

DOCUMENT NUMBER: 9124408

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: Researchers at the Space Physics Department: UNAM, MEXICO

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 09/30/91

SUBJECT: A LETTER EXPRESSING THEIR CONCERN OVER THE PROPOSED
MOVE OF THE GEOPHYSICS LABORATORY FROM HANSCOM AFB
TO THE PHILLIPS LABORATORY IN ALBUQUERQUE, NEW
MEXICO.

DIRECTORATE
ASSIGNED:

STAFF
ASSIGNED:

ACTION
REQUIRED:

STAFF
ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE:
DATE COMPLETED:

STAFF DUE DATE
DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #:

CONTACT PERSON:
PHONE:

EXT:

REMARKS:

OSTP RECEIVED: 10/15/91 DEPT RECEIVED:
FILE: P-PHYSICAL SCIENCES-GEOPHYSICS

4408



UNIVERSIDAD NACIONAL
AUTÓNOMA DE MÉXICO

INSTITUTO DE GEOFISICA

CIUDAD UNIVERSITARIA

DELEGACION DE COYOACAN

CODIGO 04510 MEXICO, D. F.

91 OCT 15 All September 30, 1991.

OFFICE OF THE
DIRECTOR

DR. D. ALLAN BROMLEY
ASSISTANT TO THE PRESIDENT FOR SCIENCE AND TECHNOLOGY
OFFICE OF SCIENCE AND TECHNOLOGY POLICY-ROOM 360
OLD EXECUTIVE OFFICE BUILDING
17th STREET AND PENNSYLVANIA AVENUE, NW
WASHINGTON, DC 20506
USA.

Dear Dr. Bromley:

We were informed that the Air Force is considering the transfer of the Geophysics Laboratory, which is presently located at Hanscom, AFB, Massachusetts, to the newly established Philips Laboratory at Albuquerque, New Mexico. As we understand from discussions with our associates at the Geophysics Laboratory, the proposed move could seriously affect the laboratory's productivity due to a large number of key scientists being unable to relocate, and then it could take many years for the relocated laboratory to regain its present level of expertise.

Our department of Space Physics in the Universidad Nacional Autónoma de México has had very close academic and personal relations with the scientific staff at the GL and we have them in our highest esteem. We join them in their worries about the problems and deterioration of their scientific production that will be caused by the proposed relocation and ask you to hear their proposals. The better they can work, the better your science can be developed and the better your collaboration to the solution of some of the problems we all are interested in solving.

Very Truly Yours

Researchers at the Space Physics Department
UNAM, México.

Silvia Bravo

Dr. Silvia Bravo
Head of the Department

Javier Otaola

Dr. Javier Otaola

Roman Pérez-Enríquez

Dr. Roman Pérez-Enríquez

Blanca Mendoza

Dra. Blanca Mendoza

H. Pérez de Tejada

Dr. H. Pérez de Tejada

José Fco. Valdés-Galicia

Dr. José Fco. Valdés-Galicia

"CORRESPONDENCE TRACKING"

TYPE: ACTION DOCUMENT NUMBER: 9124182
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: KELLY, D.A.: SPACE ENERGY ASSOCIATION-SEA/US

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 09/19/91

SUBJECT: A COPY OF THEIR LATEST, SPECIAL SEPTEMBER EDITION OF
THEIR SEA/U.S. NEWLETTER, FOR REVIEW AND
CONSIDERATION.

DIRECTORATE STAFF
ASSIGNED: PHYSICAL SCIENCES ASSIGNED:

No reply is necessary
ACTION STAFF
REQUIRED: DIRECT REPLY AS NECESSARY ACTION:

SENDER'S DUE DATE: STAFF DUE DATE
OSTP DUE DATE: 10/08/91
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: *He* **CLOSED**

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS: *Newsletter sent to OSTP for information.
No action was requested by the sender
10/6/91*

OSTP RECEIVED: 09/24/91 FILE: P-PHYSICAL SCIENCES-ENERGY
DEPT RECEIVED:

SPACE ENERGY ASSOCIATION-SEA/US

Alternate Energy Systems

RECEIVED

4182
P.O. Box 11422
Clearwater, FL 34616
(813) 442-3923
FAX (813) 446-5290

9 SEP 24 P 4 03
Presidential Science Advisor
The White House Office
1600 Pennsylvania Avenue
Washington, D.C., 20500

September 19, 1991

OFFICE OF THE
DIRECTOR
Presidential Science Advisor

Reference:

Dear Sir:

I.E.C.E.C. meeting at Boston, on
August 3rd thru 9th, 1991

We are enclosing a copy of our latest, Special September edition of our SEA/U.S. newsletter, for your review and consideration at this time.

The results of the recent I.E.C.E.C. meeting at Boston, August 3rd-9th, have been **outstanding**, - at least as far as the exposure of practical "free energy" hardware/prototype projects has taken us.

It is now becoming apparent that space/ether energy can be converted in two ways that we, and several other groups, now have under study: ie:

- 1) Conversion via high voltage spark gaps, and possibly within vacuum tubes.
- 2) Conversion within the magnetic cores, when the magnetic fields surrounding the coils over such magnetic cores are cancelled, (in the case of bifilar or cadueous coils wound over permanent magnets) Such cancellation of the magnetic field, around the conductors causes the orthorotation of the core magnetic field - to contact ether/space ie: (5th dimension) and conduct it into the twin coil sets.

Much study remains to be done in this area, but we are now into the prototype phase on such project work in this new area of applied physics.

A very promising area for future F/E system development are the several electrostatic generators now in progress.

The Swiss M-L Converter was the first of such outstanding F/E systems to be disclosed, and this project work has now been followed up with the Wm Hyde E/S generator, which is featuring a number of new operating components which are considerable improvements over the existing art.

We hope that this information may be of some interest to you at this time.

P.S. We believe that both the D.O.E. and the U.S. Patent Office must now answer to charges of culpable scientific ignorance! We expect to enter a Class Action law suit against these U.S. government agencies shortly!

Yours truly,

D.A. Kelly

THE SPACE ENERGY ASSOCIATION

SEA/US
QUARTERLY - NEWSLETTER
VOLUME II NO. 3
SEPTEMBER, 1991 *

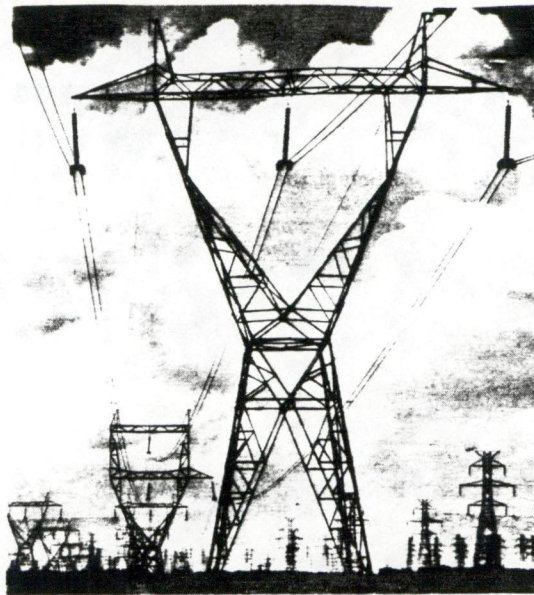
* SPECIAL
FREE ENERGY
VALIDATION
ISSUE

ANY MAJOR INDUSTRIAL NATION THAT FALLS ASLEEP TECHNOLOGICALLY
IS BOUND TO BE SURPASSED BY OTHER TECHNICALLY ASTUTE NATIONS
WHICH WILL FILL THE VOID CREATED BY SCIENTIFIC ESTABLISHMENTS
THAT ARE APATHETIC AND SLOTHFUL IN THEIR JUDGEMENT OF NEW ART!!

SPACE ENERGY ASSOCIATION /U.S.

P.O.Box 11422
Clearwater, FL.,
34616

MAKE YOUR CHOICE !



A typical high voltage transmission tower, such as the one shown above represents a large economic investment, and is a means to an end, rather than being the end means itself!

This HV transmission tower is the approximate economic equivalent of 25 Swiss M-L Converters of the 3 to 4 KW Class, as shown below.

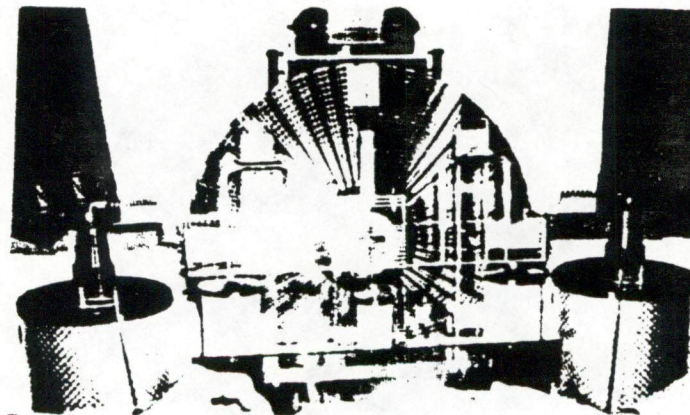
It no longer makes any technological or social sense to invest in these large "means to an end" rather than compact, efficient decentralized energy producing means!

The Swiss M-L Converter is shown as a typical free energy system, but there are other F/E systems now emerging which can serve the same purpose just as well!

The U.S. must now make the choice to adopt rational advanced energy technology, or have it all done overseas, where it will then be exported to us, at a heavy moral and financial cost to us!

It is most unfortunate that we have let politicians and bureaucrats dictate our energy policy over the years, instead of letting our more dedicated scientists and engineers run our energy programs.

Our present U.S. Department of Energy is a big joke on us, since it is now run by industry, for industry and is not answerable to anyone that does not have the right influence!



The Swiss M-L Converter, 3-4KW Class

FREE ENERGY VALIDATION ISSUE, based on the I.E.C.E.C.

The free energy papers/presentations made at the recent I.E.C.E.C. at Boston on August 3rd through the 9th, has been far more successful than any of us had dared hoped for!

There were a number of excellent, outstanding and worthwhile papers presented by a wide, diverse group of free energy researchers, which have now brought out the reality of the free energy concept beyond any possible doubts.

The most compelling paper presentations were the ones that described either operating F/E prototype hardware, or ones that are now being projected as viable prototype projects.

Some of the theoretical F/E papers were in the excellent category because they clearly showed how certain physical anomalies in operating F/E hardware is not being explained by an intransigent scientific establishment!

Other F/E papers in the outstanding category brought out certain physical phenomena which is directly applicable to F/E units and systems, but which has not yet been fully explored and tested in any F/E project.

The advent of the new, larger Swiss M-L Converter clearly establishes these electrostatic converters systems as a leading contender for future F/E installations.

The later Wm. Hyde E/S generator can be considered as a spin-off system from the Swiss M-L Converter, but it does stand on its own merit because of the introduction of new components within these electrostatic systems which have not been seen before in this art.

The major reason why these electrostatic machines are so efficient and attractive is that, unlike comparable E/M machines, they are not handicapped by sizable magnetic drag in the rotating components, nor are they subjected to back-EMF, i.e. Lenz's Law in their operation.

The E/S discs spin quite easily, even when they are producing near maximum voltage output levels, which make motorizing the discs a relatively easy and effective task.

It is interesting to note that the two leading F/E contenders are hybrid systems, consisting of both rotating/dynamic E/S components and solid-state conversions sections.

Several F/E researchers are now projecting that the full solid-state F/E converters will be the "wave of the future" in F/E, but for the present these s/s projects have encountered serious operating and reliability problems.

Some of these present s/s systems have now established their "proof of principle", in that they do operate effectively, but considerable R & D remains to be done before they eventually establish long-term reliability.

The free energy field is now essentially in the "bird in-hand" situation, with the solid-state F/E systems being the "bird in the bush"! It is now clear that the two electrostatic systems represent the "bird-in-hand" situation since they have both proven their operability and reliability due to the many years that they have been in the developing stages.

Several researchers are now elected - to go with the "bird-in-hand" E/S generators, as now proven by the Swiss M-L Converter and the later Hyde E/S generator.

These F/E researchers believe that it has now become practical to become involved with the now-proven E/S technology, rather than gamble that

the various solid-state systems can eventually make the grade with long-term dependability within the foreseeable future.

The cost/effectiveness factor has entered into this F/E system type decision, since the hybrid F/E systems present known quantities, whereas the full solid-state systems present largely unknown elements, at this point in time.

It is now quite likely that all the dynamic/rotating E/M units will gradually fade away from the F/E scene, since they will no longer be able to successfully compete with the E/S hybrid systems, and the later all S/S systems in the long term.

We have all now clearly seen the generally poor performance in all the various E/M systems that have come along, such as Joe Newman's machine, the Kromrey unit, and the various other types of Faraday-induction machines.

Any F/E researchers who are now working in this E/M, Faraday's induction area should take heed of the changing direction in F/E technology, and reassess their present position so that they are not outdated and assigned to an "also ran" status with their F/E project work.

Another type of prospective F/F unit is the permanent magnet motor, or P.M.M., which are now slowly being evolved.

There is a report that Howard Johnson is now constructing an improved version of his original P.M.M., and this one is said to be self-starting which would be a considerable advancement over his prior art!

A controversy is now swirling over the P.M.M. project work of Troy Reed of Tulsa, OK. Various detractors of this P.M.M. project are objecting to the use of a small input D.C. motor and battery arrangement, as a rotational "maintenance" function for the Reed P.M.M.

The fact that the twin Reed magnetic rotors may be assisted in maintaining a constant (300) rpm under load, in and of itself is not a negative design factor for the Reed P.M.M. (It was unfortunate that Troy Reed designated this D.C. motor as a "starter" motor in the videotapes)

The input to output ratio in these P.M.M.'s is the deciding feature for judging their relative merit in the F/E field, but some people don't seem to be able to grasp this reality!

We now view this Reed P.M.M. project as R & D in progress, and believe that they have a considerable way to go before they will have a final, pre-production prototype available. We hope that they will consider the "brute force" direction in this project in which many, say four or five magnetic rotor and stator sets are used to gain more output torque.

The merits of using a complex crank shaft and the spring injectors for this present P.M.M. design are still questioned, and a simpler, more direct torque conversion arrangement seems to be called for, in our view.

One of the major plus features that the P.M.M.'s have going for them is long-term dependability, which is more than can presently be said for the all solid-state systems now being evolved.

Observers of the F/E scene who have limited scientific and engineering skills and vision should refrain from making premature judgements of F/E project work that is still essentially in the R & D/ evolutionary stages of progress!!

The various P.M.M. projects may never obtain high Efficiency levels, as compared to the very high levels attained by the present E/S machines, (900% and UP!), but should reach the 300% to 400% level, with a very high level of dependability!

We need to keep an open-minded/objective view of all F/E project work in progress, since such project work is expensive, time-consuming and must be evolved on a step-by-step basis.

SUMMARY OF SIGNIFICANT PAPER/PRESENTATIONS AT THE

AUGUST/91 I.E.C.E.C. EVENT

1. Dr. Harold Aspden, Dept of E.E. /Univ. of Southampton, U.K.
"On A Testable Unification of E.M., General Relativity & Quantum Mech"

Dr. Aspden's paper has brought out the reality of the free energy concept and shown how present researchers in this field are considered to be "outsiders" by our present intransigent scientific establishment.

He believes that we are now on the threshold of a transition which must change attitudes among the scientific establishment. Further, the transition will indoctrinate our electrical engineers with the belief that a "free energy" exists on a universal scale and stands as a resource offering challenge no less exciting than was the discovery and exploitation of oil fields, ie: petroleum energy!

Dr. Aspden's paper describes the requirements for valid free energy machines, and the background on which this new scientific field is based.

2. Floyd Sweet and T.E. Bearden, "Utilizing Scalar E/M To Tap Vacuum Energy."

The Sweet /Bearden paper/presentation is of major significance to the free energy field, since it describes a scientific breakthrough and workable type of solid-state vacuum energy converter which has been evolved after many years of R & D effort to tap space/vacuum energy.

There is no longer any question about the validity of the V.T.A. project, (Vacuum Triode Amplifier), as evolved by Floyd Sweet, however considerable work remains to be done to assure the reliability of the V.T.A. units.

The key reason why the V.T.A. unit is a valid F/E project is that it falls within the context of a wider technological area which encompasses the prior project work of Hans Coler (Germany 1942) and the Swiss M-L Converter project. These three F/E projects employed similar components, which will be described elsewhere in this special N/L edition.

Tom Bearden explains the profound conversion of vacuum field energy within the V.T.A. which is now a "stand-alone" F/E project, not otherwise connected to other ongoing F/E projects because of the special, "conditioned" permanent magnets used as the cores within the twin, bifilar coil windings.

Another important factor in this V.T.A. project work is that it now points the way to a Unified Field Theory- which will stand up, since the V.T.A. prototypes exhibit anti-gravity reactions during bench tests of several operating prototypes!

3. George Hathaway, "Zero-Point Energy, A New Prime Mover"

The significance of this author's paper/presentation is that he cites the various researchers and the physical effects which translate directly into working free energy systems.

Starting with a characterization of the space/vacuum, a description of various effects are provided, and their relation to practical, working F/E systems and devices, along with formulations pertinent to each system.

The author concludes with a hope that various scientific researchers will be able to review and expand on the subject matter presented in his paper.

A sizable number of references are cited (28) which provide a good support for the basic paper material, and expands on the work of the cited researchers so that a full picture of the work is provided.

4. Moray King, "Tapping the Zero-Point Energy -as an Energy Source"

As previously stated, the significance of this author's paper is that it presents data and descriptive background on a current and successful F/E project. This specific project is the William Hyde electrostatic generator, circa 1987.

A full description of this electrostatic generator, F/E project work is provided elsewhere in this special N/L.

5. Dr. Wingate Lambertson, "History and Status of the WIN Process".

The "WIN" F/E system is another paper/presentation which describes a tangible F/E project which has been developed over the past 18 years!

The "WIN" system has undergone several sizable revisions in its nature over the years, but the key components such as the capacitor and resistor banks remain as basic to the system, along with the dam and side load.

Another significant change has been the replacement of the open spark gap with an arc lamp component.

The power supply consists of an auto/transformer and a rectifier bridge. The power/Efficiency, ~~mean~~ level is reported at 965% and is now in a commercially viable range. In previous years the efficiency level had been in the 720% range, and has since been improved by the new techniques and components now in use.

The "WIN" Process is basically a means for converting zero-point energy into useable electric power for various home and commercial applications.

The application for which the process may be most easily transferred to will be for lighting purposes. The present WIN system prototype may be used to power 15- 400 watt lamps. (6KW)

6. Dr. Paul A. LaViolette (The Starburst Foundation)

"Subquantum Kinetics, Exploring the Crack in the First Law."

The value in this significant paper/presentation is that the author highlights how the First Law of Energy Conservation has been breached both in Nature and by some F/E research projects!

A variety of free energy methods are presented which include: 1) Genic energy, 2) Zero-Point energy fluctuations, 3) Ampere Law forces, 4) Gravity Field manipulation.

This paper concludes with the statement: "We are entering an era in which physics theories of the past are increasingly falling behind in their ability to explain adequately the emerging energy technologies."

"There is now a pressing need to investigate new theoretical approaches in which spontaneous energy creation is the rule, rather than the exception."

7. Dr. Patrick Bailey: "The Methernitha Free Energy Machine, The Swiss M-L Converter." (Some reference information provided by D. Kelly)

This is another paper/presentation which describes a F/E system which is probably the best of all the known converters. It is the "King" of converters since it operates at the highest possible Efficiency level, because it has no input of any type, after the twin E/S discs are revolved by hand.

The official establishment ignorance of this excellent F/E technology now borders on culpable scientific stupidity. The free energy "Sputnik" went up years ago with the perfection of this converter, and yet the present scientific community behaves as if technological stupidity is a virtue!!

The recent introduction of the new, larger 30KW, 2 meter dia. discs, has made this specific technology more attractive and compelling than ever before. There is an obvious scale factor for these F/E machines, but some practical limits to the E/S disc diameters exist.

8. Richard (Scott) McKie, GammaStar International, Inc.
"POD-MOD" - Power Generation for a Brave New World Order

This paper/presentation describes the ongoing "POD-MOD" - (Power On Demand Module) project work which is now well along in its R & D stage of progress.

While this presentation tends to describe this project in general, overview terms - is a remarkable solid-state system which makes a very good case for the enhanced tank circuit concept. The tank circuit approach has a lengthy, and solid background to draw from in the continued development of this project.

The "POD-MOD" F/E project will be further described elsewhere in this N/L.

9. Dr. P.T. Pappas, Prof. of Physics & Mathematics, Technical Education Institute of Piraeus, Athens, Greece
"Energy Creation in Electrical Sparks and Discharges: Theory and Direct Experimental Evidence?"

Dr. Pappas's paper is of major importance to the emerging and ongoing F/E field, since he provides detailed information on specific physical phenomena which is directly applicable to several ongoing F/E projects!!

Of particular significance is the statement that "displacement currents exist inside the capacitor gap, and that these currents are effective by equivalent to the conduction currents -----"!

This statement and its implications has a special meaning to those F/E projects which utilize a modest to large number of capacitors within their solid-state conversion circuitry!

Another useful portion of this paper was the disclosure of the excess energy produced within arc gaps. The theory is backed-up by experimental arc oscillations shown on an oscilloscope, which indicate a buildup of oscillations of much higher amplitude than the D.C. potential allowance in the circuit!

The technical information provided in this extraordinary paper should be of major value to several ongoing F/E projects, which may thus be guided into more effective and optimum design of specific portions of their systems.

10. Troy Reed, "The Reed Magnetic Motor, The Motor of Tomorrow"

Comments on this current, ongoing Reed P.M.M. are provided in another portion of this present Sept./91, N/L.

The present Reed P.M.M. should be considered as R & D in progress and there is a need to refine their present prototype into a more practical design which does not utilize extraneous hardware elements which do not make a cost/effective contribution to the output HP.

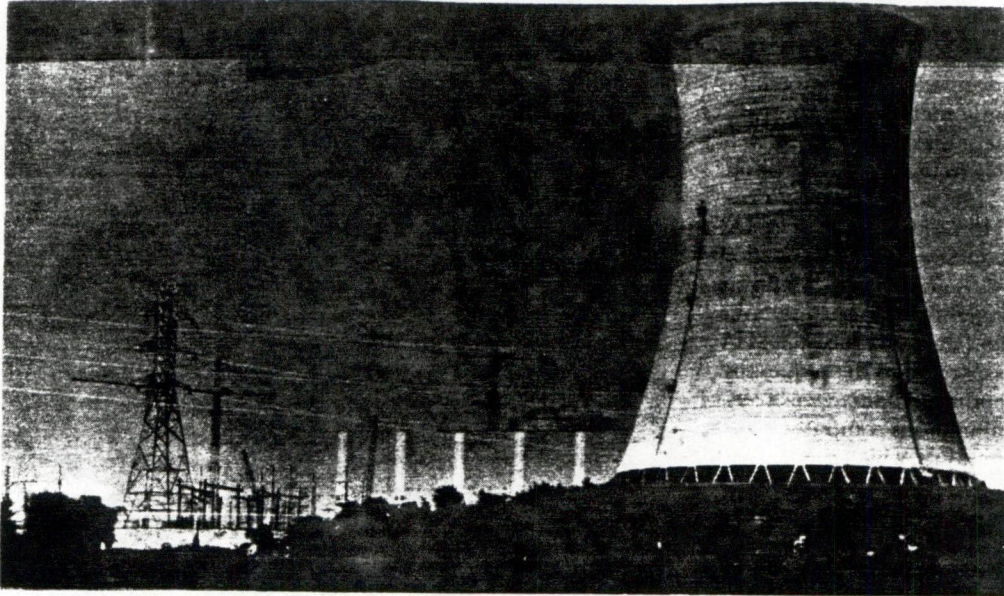
11. Shiuji Inomata, ETL, MITI, Japan and, 12. Bruce DePalma, DePalma Inst.
"New Paradigm and the N-Machine." "N" Machine Pioneer

Again, the value of these paper/presentations is in the disclosure of a long-term true free energy machine which has clearly shown a continuous over-unity-output track record over the years.

Although the o/u/o levels of the "N" machines has never been exceptionally high, being in the 300% to about 500% Efficiency range, they do provide good dependability of operation, and are basically durable and solid F/E machines!

It is probable that they can be continuously improved and evolved to the point that they will be viable contenders for various energy supply/service.

RATIONAL ENERGY MEANS ?



Three Mile Island

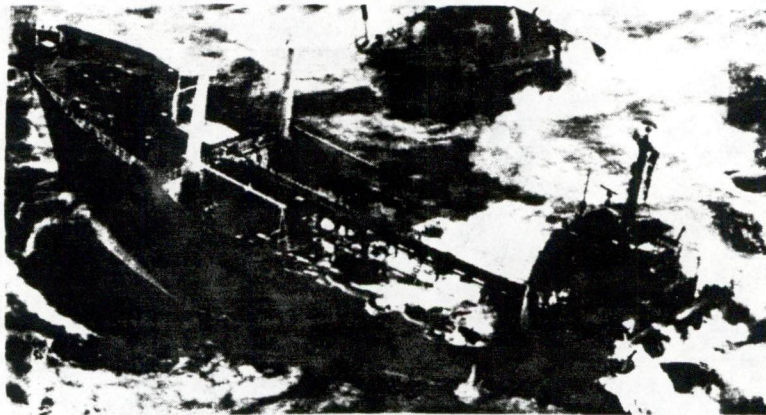
The original nuclear scientists back in the late 40's and 50's lied to us about the value of centralized nuclear power plants, and the industrialists compounded the evil of these lies!!

"Too cheap to meter" has become a bitter and costly pill to swallow for many ratepayers, but a practical remedy exists with the emerging decentralized free energy systems now being evolved!

A nation that wallows too long in technological stupidity is bound to suffer -the long-term consequences of being mislead by so-called scientists and engineers who have very little social conscience!!

Most of today's professional scientists and engineers are "under the thumbs" of industrialists who need to make big profits, no matter what the social degradation costs are!!

Either we must fully revise scientific thinking and adopt the new advanced energy conversion techniques, or it will become accepted overseas by nations that are not "lock-in" with primitive oil/coal energy resources.



Here is another example of "a means to an end", which makes no real technological or social sense at all!!

A major U.S. corporation now boasts that they are now only using double-hulled oil tankers, but SEA/U.S. believes that this technique, just like the " sarcophagus" that enshrouds the damaged Chernobyl nuclear reactor, just points to, and highlights fundamentally flawed energy technology!!

Like the past song said; "When will they ever learn, when will they ever learn??"

THE HYDE Electrostatic Generator Project & Moray King's Presentation
to the I.E.C.E.C. (Partial description)

There is now a growing consensus of opinion that the William Hyde electrostatic generator art is both valid and attractive free energy technology which should be rapidly developed since Hyde himself is no longer free to do this after being harrassed and gone into hiding!!!

The Hyde E/S generator art meets all the stringent criteria for judging prospective F/E technology, ie:-

- 1) It is self-running, or can operate at an attractive over-unity-output ratio.
- 2) It has been proven valid with a completed operating prototype with operating specs. and description fully available.
- 3) The operating prototype must run continuously, with no break-downs, and be dependable and rugged enough to operate continuously under adverse operating conditions, such as 60 HZ. proximity exposure, all forms of radiations, and similar exposure conditions.

The Wm. Hyde U.S. Patent (No. 4,897,592) technical description and full operating prototype of 1987 meets the above criteria for F/E systems, as itemized above.

Moray King's paper/presentation to the August/91 I.E.C.E.C. provides some of the design description and specs of the Hyde prototype and technology which is presented as follows, with some SEA/U.S. input:-

The Hyde electrostatic generator art is based on conventional electrostatic generators by the use of rotating, segmented discs, as in the Swiss M-L Converter.

Wm. Hyde has introduced several new components to electrostatic generator art by way of stator discs and end excitation electrode plates.

An external voltage source (at 3KV.) charges the electrode plates which provide the positive and negative polarization field at the respective ends of the generator. The twin, opposite rotor discs in the Hyde E/S generator spin in the same direction, and thus require the distinct positive and negative excitation within each polarized compartment.

This is a departure from the usual electrostatic machines, ie: Wimshurst generators, as used in the Swiss M-L-C., where the opposite polarities are provided by the contra-rotating Wimshurst discs.

As the rotor discs spin in the same direction, aligned stator segments are alternately exposed to and shield from the the excitor polarization fields. Each stator segment is electrically connected to its counterpart on the opposite stator through a pulsed rectifier circuit, in which the transient voltage pulses are stepped down and directed to a combining rectifier output circuit.

While the Swiss M-L Converter can provide about 70 KV to the solid-state circuitry, when the twin rotors are spun at 60 rpm, the Hyde E/S generator's rotors spin up to about 6000 rpm. With the 3 KV. excitation potential on the excitor end plates, will yield stator pulses in excess of 300 KV, with a very small drag on the rotor discs!

In the accompanying patent drawing, Figures 3 and 4, show rotor and stator segments, respectively, but these are in schematic form, since it is known that Hyde used up to 240 rotor segments and 480 stator segments in his 1987 prototype E/S generator.

THE HYDE Electrostatic Generator Project

Comparison of the Hyde E/S Generator and the Swiss M-L Converter

It is believed that such E/S generators will function quite well with far fewer conductive segments, since this fact has now been established by the Swiss M-L Converter, which uses a mere 50 stainless steel segments on each of its twin Wimshurst E/S discs.

For those researchers interested in replicating the Hyde E/S Generator, Moray King recommends that they set up the mechanical embodiment, as described in the Hyde patent. Following the patent specs, the excitor plates are charged to 3KV, but insulators must prevent corona discharge, as described in the patent.

The rotor and stator discs and the two electrode plates should be closely spaced to optimize the voltage output, but problems of corona breakdown must be avoided, as determined by experimentation.

Wm. Hyde used a distributed, parallel voltage dividing rectification technique, so that no one stage experienced too great a voltage surge. This arrangement accounts for the large number (2000) of small capacitors and diodes that were used in the 1987 prototype of the E/S generator.

While it is clear that such a staged voltage dividing circuit can function effectively to drop the voltage down, we are still left with the question of where the EMF amplification comes from in these E/S, s/s systems?

In the voltage-dividing, transformation process the current/ampereage will rise nearly proportionally to the total wattage level, but what happens?

The following specifications for the 1987 Hyde prototype indicate this current rise anomaly:

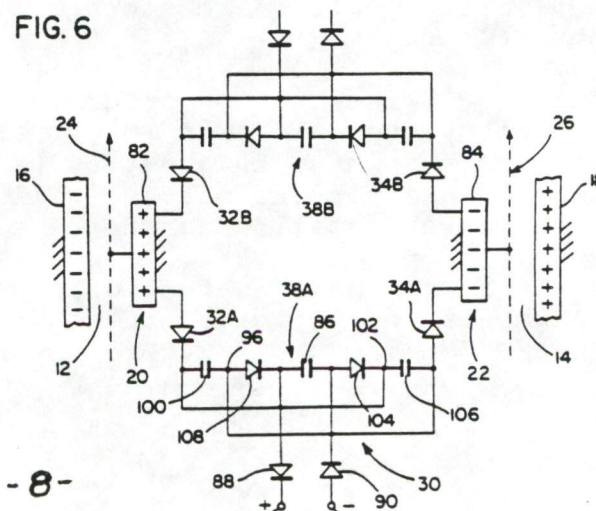
No. of rotor segments 240, No. of stator segments 480, Rotor speed 6000 rpm., Excitor plate(s) voltage 3KV/D.C., Output voltage 602 V,D.C., Output current 38 amperes, Output power 22.9 KW., Input power 2.4 KW., Net output power, while free running = 20.5 KW., (approx, Efficiency 900%)

We now understand how the Swiss M-L Converter handles the transformer/amplification process in their solid state portion, ie: through the two, large capacitive/amplifiers at the sides of the system package, but this process is still somewhat of a mystery in the Hyde E/S generator.

There are some significant indicators to point to the CAPACITORS in the Hyde E/S generator as the ZPE, or space energy converters, but much study needs to be done in this amplification process before we know for sure what is actually going on in these various components!!

In his I.E.C.E.C. paper/presentation Dr. P.T. Pappas sheds some useful light on displacement current conversion within capacitor gaps, and on the excess energy within spark gaps/arcs, which needs further study.

THE HYDE TRANSFORMER/ AMPLIFICATION /SOLID STATE CIRCUITRY



WM. HYDE E/S GENERATOR

U.S. Patent

Jan. 30, 1990

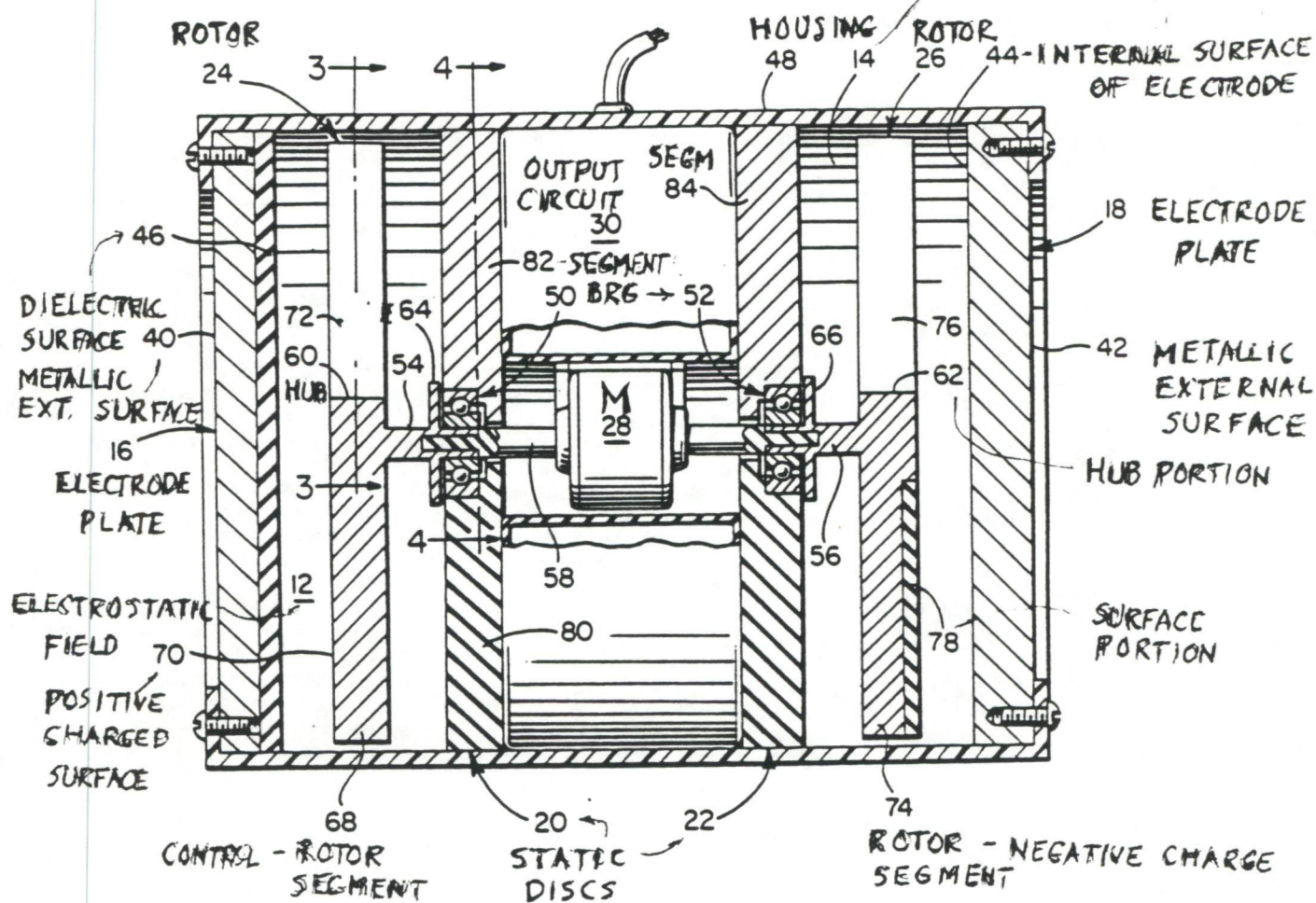
Sheet 2 of 3

4,897,592

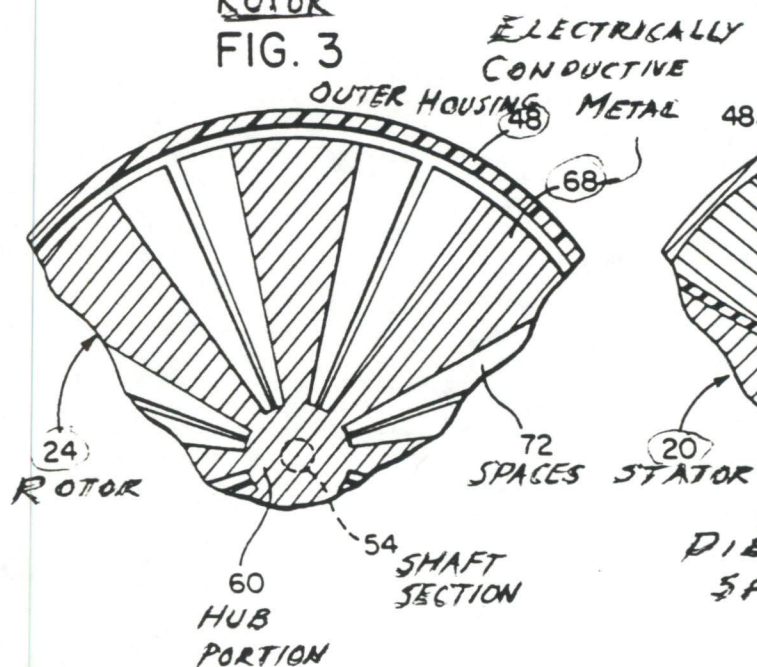
NEGATIVE

ELECTROSTATIC FIELD

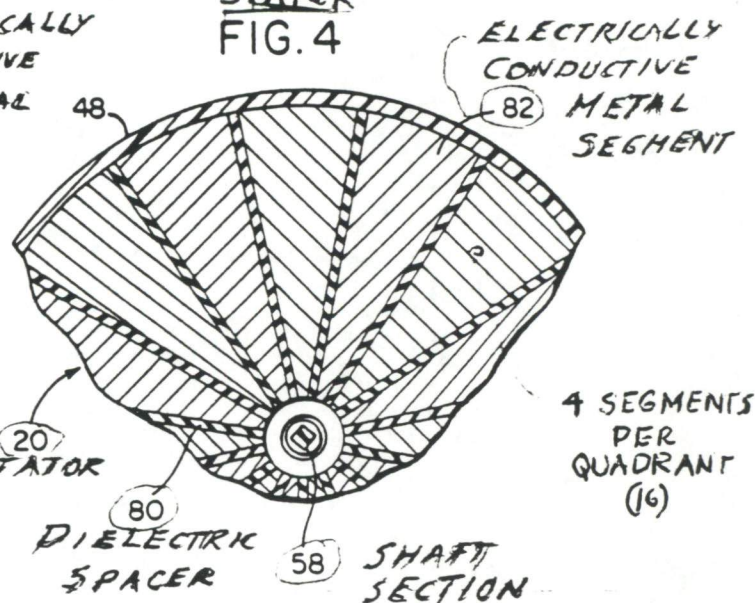
FIG. 2



ROTOR
FIG. 3



STATOR
FIG. 4



binding and unbinding actions induced by rotation of the rotors. The stator segments 82 and 84 shielded from the electric fields by the moving rotor segments 68 and 74 as depicted in FIG. 5B, have electric potentials of polarity opposite to those of the external electrodes 16 and 18 because of the field linkage charge unbinding action. Previously shielded stator segments being exposed to the electric fields by the moving rotor segments, have the same electric potential polarity as those of the external electrodes because of field linkage binding action. Since the forces exerted on the respective rotors by the electric fields 12 and 14 of opposite polarity act on the common rotor shaft assembly perpendicular to said fields, such forces cancel each other. The energy input to the system may therefore be substantially limited to mechanical bearing losses and windage during conversion of electrostatic field energy to electrical energy as well as electrical resistance losses and other electrical losses encountered in the output circuit 30.

Based upon the foregoing operational characteristics, rotation of the rotors in accordance with the present invention does not perform any substantial work against the external electric fields 12 and 14 since there is no net change in capacitance thereby enabling the system to convert energy with a reduced input of mechanical energy and high efficiency, as evidenced by minimal loss of charge on the electrodes. It was therefore found that working embodiments of the present invention require less than ten percent of the electrical output energy for the mechanical input. Further, according to this prototype model of the invention, a relatively high output voltage of 300,000 volts was obtained across the stator. By reason of such high voltage, an output circuit 30 having a voltage reducing and current multiplying attribute as heretofore described was selected so as to render the system suitable for many practical applications.

The foregoing is considered as illustrative only of the principles of the invention. Further since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and, accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed is:

1. An energy conversion system including a pair of electrodes maintained electrostatically charged at substantially equal potentials of opposite polarity, stator means mounted in operatively spaced relation to said electrodes for inducement therein of charges of opposite polarity through electric fields established by said equal potentials, power driven rotor means continuously disposed within said electric fields for receiving charges induced by said electric fields, means electrically connecting said rotor means to the stator means for equalizing of said induced charges therebetween, field linkage control means for movably shielding the stator means from the electric fields during rotation of the rotor means and output circuit means operatively connected to the stator means for extracting therefrom an operating voltage in response to movement of said shielding of the stator means.

2. The system as defined in claim 1 wherein said stator means includes a pair of axially spaced stator discs respectively linked electrostatically to the electrodes by said electric fields, the rotor means including a

pair of rotor discs respectively disposed axially between the electrodes and the stator discs.

3. The system as defined in claim 2 wherein said field linkage control means comprises angularly spaced segments on the rotor discs having charged faces shielding portions of the stator discs from the electrodes.

4. The system as defined in claim 3 wherein each of the stator discs includes angularly spaced surface portions confronting the angularly spaced rotor segments and dielectric means between said surface portions for confining the induced charges thereto, the surface portions of the stator discs and the charged faces of the rotor segments being unequal in area.

5. An energy conversion system including a pair of electrodes electrostatically charged to substantially equal potentials of opposite polarity, stator means mounted in operatively spaced relation to said electrodes for inducement therein of charges of opposite polarity through electric fields established by said equal potentials, said stator means including a pair of axially spaced stator discs respectively linked to the electrodes by said electric fields, power driven rotor means continuously disposed within said electric fields for receiving induced charges thereon, means electrically connecting said rotor means to the stator means for transfer of said induced charges therebetween, said rotor means including a pair of rotor discs respectively disposed axially between the electrodes and the stator discs and field linkage control means for variably shielding the stator means from the electric fields during rotation of the rotor means, said field linkage control means comprising angularly spaced segments on the rotor discs having charged faces shielding portions of the stator discs from the electrodes, each of the stator discs including angularly spaced surface portions confronting the angularly spaced rotor segments and dielectric means between said surface portions for confining the induced charges thereto, the surface portions of the stator disc having areas twice that of the areas of the charged faces of the rotor segments and output circuit means operatively connected to the stator means for establishing an operating voltage in response to said variation in the shielding of the stator means by the rotor means.

6. The system as defined in claim 5 including a power shaft assembly on which the rotors are mounted for simultaneous rotation, said electrical connecting means being formed by electrically conductive sections of said shaft assembly.

7. The system as defined in claim 6 wherein the charged faces of the rotor segments on one of the rotors is formed by dielectric material within which the induced charges of negative polarity are confined in stable ion form.

8. The system as defined in claim 7 wherein said output circuit means includes a pair of dc voltage terminals, a capacitive network, and current blocking diode means coupling the network to the terminals and to each of the surface portions of the stator discs for multiplying current conducted between the stator discs while reducing potentials therebetween to a value equal to the operating voltage across the dc voltage terminals.

9. The system as defined in claim 2 wherein each of the stator discs includes angularly spaced surface portions confronting the rotor and dielectric means between said surface portions for confining the induced charges thereto.

10. The system as defined in claim 9 wherein said output circuit means includes a pair of dc voltage termi-

→
300KV
↓
20KW
with 10%
loss - (2KW)
↓
900% EFF.

The VACUUM TRIODE AMPLIFIER - (V.T.A.) PROJECT

of Floyd Sweet

The V.T.A. (Vacuum Triode Amplifier) is an all solid-state energy converter ~~which is~~ based on the PPCM, or phased conjugate mirror theory, and Whittaker theory.

Floyd Sweet has managed to synthesize these above theories and has developed a complete theoretical basic for the first VT devices. The nuclear potential of his early devices was increased in the activated nuclei of the core, which increased the pumping energy and hence the full energy output.

He next produced an open-loop vacuum triode (VT) with an output of 500 watts, with an input of 33 microwatts. After this he produced several other VT models, including a closed-loop system, (VTA), and one with a 5KW output.

The major reason why the VTA units are a valid F/E project is that they fall within the context of a wider technological area which encompasses the prior project work of Hans Coler (Germany 1942) and that of Paul Baumann, of the Swiss commune "Methernitha".

The common factor in all three of these F/E projects is that they all use ~~twin~~, bifilar wound coils over permanent magnets (ferrites). The bifilar - (a single length of wire which is helically wound back on itself) as non-inductive windings cancel - the magnetic field caused by the normal, exciting EMF flow, and thus allow the core magnet stack to ~~orthorotate~~ rotate its field into the 5th, and higher dimensions, for space energy conversion.

The theory behind this space/ether energy conversion is provided by the past scientific work of Franz Kalusa and Oskar Kline, in 1919 thru 1926. Kalusa proposed a five-dimension theory of gravity, and believed that the 5th and 6th dimensions were "curled up" within the other four dimensions.

This theory was given to Albert Einstein, who at first, did not readily accept it, but was finally convinced of its merit, and gave his approval to be published by the Prussian Science Academy.

It is now believed that this ~~orthorotated~~ rotated magnetic core field directly influences the 5th and higher dimensions and thereby converts ether/space energy into the coils of the V.T.A., the Swiss M-L Converters and the earlier coils of Coler's "Magnetstromapparat" unit.

Although these three F/E units/systems employ the same type of basic construction, ie: bifilar wound coils over the permanent magnet stacks, it is conceded that the Sweet V.T.A. is a "stand-alone device", since it uses special "conditioned or activated" permanent magnet material, unlike the other two F/E Systems cited.

In its physical form, the V.T.A. consists of the two parallel coil and magnets components, which are presumed to be positive and negative polarities, with the inputs connected to a small 60HZ oscillator, which in turn are connected to a standard nine volt battery, as the source.

The twin output leads would be connected to the suitable load at the same end of the coils as the input leads, due to the bifilar winding technique.

From the various reports that have been received about the problems in the operation and testing of the latest V.T.A., it seems that the prototype cannot have not shown the ability to continue operation for extended periods of time. Some believe that the normal operation is subject to outside electrical disturbances, which upset the resonant functioning of the unit.

It may, or may not be possible to clear up this continuous operating problem, and we must await further troubleshooting and development of this unique V.T.A. technology.

The "POD-MOD" (Power on Demand Module)
A solid-state Power Generation System

of Richard (Scott) McKie
GammaStar International Corporation
Seattle, WA., U.S.

The "POD-MOD" (Power on Demand Modular system) project is basically a battery-powered, solid-state module system which is said to produce up to 4000 times the input power.

Prototypes have been built and tested over the years, which included independent testing done by outside laboratories. A patent application has been filed in both the U.S. and in other countries to protect the rights to this new art.

Plans are now underway for full-scale commercial production of the POD-MOD /system, which may be housed in standard 40 foot long shipping containers. The continuous base-load generating capacity for these large shipping containers with the POD-MOD system will be 10MW.

These standard 10MW portable containers can totally replace existing power generating facilities, and can avoid the need for the construction of new power stations based on conventional fossil fuel energy installations. The standard 10MW containers can also be placed into utility substations when such sub-stations are temporarily out-of-service.

The POD-MOD's, in smaller package versions have the potential to power cars, boats, trains, and even planes.

The POD-MOD circuitry is mainly based on the enhanced tank circuit concept in which inductors (L) coact with an array of capacitors (C), and resistors (R), as in conventional L,C,R, tank circuitry.

The validity of tank circuits as projected F/E units has been established by several past researchers and R & D groups. Reference is made to several papers presented to the I.E.C.E.C. on this tank circuit concept.

The POD-MODS have the following features:

- 1) They are fully portable, modular and self-contained power sources, requiring only a 12 volt battery input.
- 2) They are all solid-state and are environmentally benign.
- 3) They can be built in varying size/volumes, as a flexible power source for many service applications.
- 4) The maximum, projected output will be 10,000 KW/ie: 10 MW.
- 5) Will produce 87,600 MW hrs, per year, sufficient to meet the power needs of 7000 homes.
- 6) Have a minimum of 10 years service life span, before refurbishing is required.
- 7) Will eliminate both high-voltage transmission towers and means, and future conventional power plant installations.
- 8) Can readily replace all other present sources of power generator installations.

The unique feature of using a standard 40 foot shipping containers to house the POD-MOD assembly is an interesting and very useful concept, which is fairly self-evident!

It would mean that such useful levels of portable power sources can be readily transported to places where electrical power is urgently needed during emergencies, disasters, etc.

It also becomes apparent that this standard shipping container method is also open to other types of F/E systems, which may become viable as the technology moves ahead!

"A RACE FOR TOMORROW"

ENER--RUN

CROSS COUNTRY RALLY
For ALTERNATELY POWERED
VEHICLES

• SPORTPRO INC. •

RUN

SPORTPRO, INC.

SPORTS

SPORTPRO, INC. is pleased to present an opportunity to all inventors, car enthusiasts, universities, technology colleges, scientists, major auto manufacturers and designers to show if they can meet the challenge presented by SPORTPRO, INC. ENER-RUN will be held during fourteen days in August of 1992. The challenge is a road rally from Washington D.C. to California, a total distance of some 3000 miles.

To the winners of this run will be fame and fortune. In addition, there will be a film made of the run. This film is designed for international release, and will be shown for many years after the event. For corporate sponsors, a tremendous opportunity exists to promote your products.

All entries will be contributors to the furtherance of alternately powered vehicles through their experiments and development of knowledge. All contributors will also be contributing to the education of the public as to the possibilities of the future.

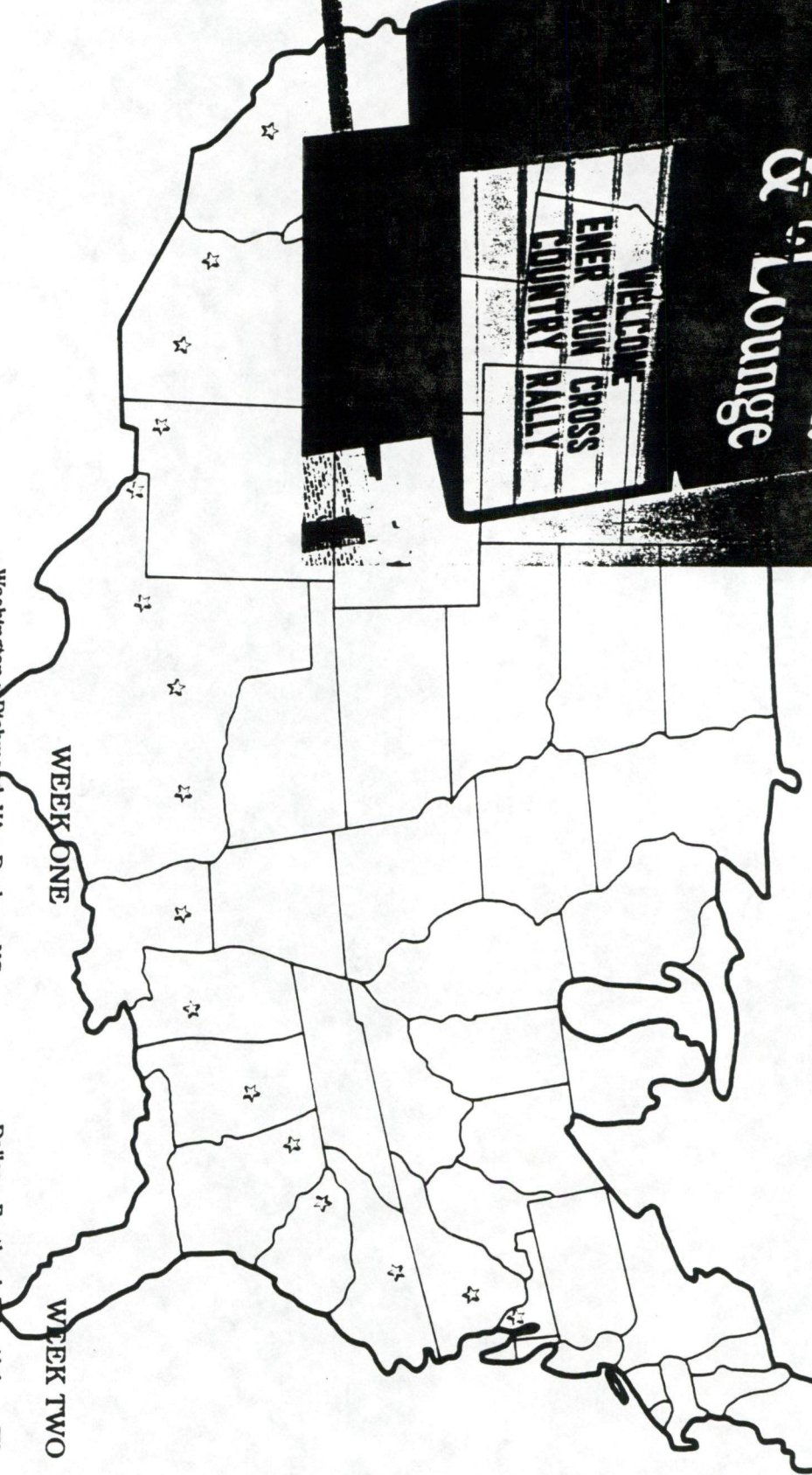


ENER--RUN[®]

Restaurant & Lounge

WELCOME
ENER RUN CROSS
COUNTRY RALLY

COAST TO COAST WITHOUT GAS!



WEEK ONE

WEEK TWO

This is the day to day schedule as planned. The organizers have scheduled stops every day at key cities for the mid-day breaks and overnight rest stops. At every stop a short press conference is planned for the local news media and a display of vehicles.

- Washington > Richmond, VA > Durham, NC
264 Miles, day 1

- Durham > Charlotte, NC > Greenville, SC
285 Miles, day 2

- Greenville > Atlanta, GA > Birmingham, AL
290 Miles, day 3

- Birmingham > Meridian, MS > Jackson, MS
240 Miles, day 4

- Jackson > Monroe, LA > Shreveport, LA
220 Miles, day 5

- Shreveport > Tyler, TX > Dallas, TX
200 Miles, day 6

- Dallas > Eastland, TX > Abilene, TX
170 Miles, day 8

- Abilene, TX > Big Spring, TX > Odessa, TX
170 Miles, day 9

- Odessa > Van Horn, TX > El Paso, TX
285 Miles, day 10

- El Paso > Deming, NM > Willcox, AZ
245 Miles, day 11

- Willcox > Tucson, AZ > Phoenix, AZ
222 Miles, day 12

- Phoenix > Quartzsite, AZ > Indio, CA
245 Miles, day 13

- Indio > San Bernardino, CA > Los Angeles, CA
160 Miles, day 14

VEHICLE ELIGIBILITY

ENTERED VEHICLES MAY BE OF FREE DESIGN AND CONSTRUCTION.

VEHICLES MUST NOT EXCEED SIX METERS IN LENGTH, NOR THREE METERS IN HEIGHT

VEHICLES MUST HAVE ADEQUATE FRICTION BRAKING.

VEHICLES IN WHICH IT IS DIFFICULT TO SEE BEHIND MUST BE EQUIPPED WITH EFFECTIVE
REAR VIEW MIRRORS.

A BRAKE LIGHT, TURN INDICATORS, AND HAZARD LIGHTS MUST BE PRESENT ON ALL
VEHICLES.

A SAFETY BELT MUST BE FITTED TO THE VEHICLE FOR ALL OCCUPANTS AND BE WORN
AT ALL TIMES.

CHAINS , SPROCKETS, BELT DRIVES, AND ALL SIMILAR MECHANISMS MUST BE COVERED
TO PREVENT ACCIDENTAL CONTACT.

"HEAD FIRST" PRONE DRIVING POSITION WILL NOT BE PERMITTED.

ALL VEHICLES MUST CONFORM WITH THE MINIMUM REQUIREMENTS FOR ONE OF THE
SEVEN ENTRY CLASSES.

FOR ADDITIONAL INFORMATION PLEASE CONTACT:

SPORTPRO, INC.
ATTN: LES ADAM
P.O. BOX 665
HARDY, AR 72542 USA
☎ 501856 3877
FAX 501 856-3590

IN EUROPE:
PURION AG
EIKE MUELLER
GRABENSTRASSE #26
ZUG CH 6300
SWITZERLAND
☎ (0) 41 -42 22 6363
FAX (0) 41 -42 22 6464

VEHICLE CLASSES

This is the different automobile classes allowed
to participate in ENER-RUN II.

The Miscellaneous class includes new
technologies and hybrid systems, not covered in
one of the previous classes.

- A > Electric Vehicles over 1,500 lbs.
- B > Electric Vehicles from 1,000 to 1,500 lbs.
- C > Electric Vehicles under 1,000 lbs.
- D > Electric Vehicles with Onboard Combustion Engines (Hybrids)
- E > Combustion Engines Operating on Fuels Other than Gasoline or Diesel
- F > Major improvements to the Current Gasoline or Diesel Engines
- G > Miscellaneous

THE COURSE

THE RUN WILL BEGIN IN WASHINGTON D.C., AND COVER 3,000 MILES BEFORE ENDING IN LOS ANGELES, CA. DURING THE 14 DAY RACE, PARTICIPANTS WILL VISIT NUMEROUS CITIES, PHOENIX, AZ; DALLAS TX; ATLANTA, GA; RICHMOND, VA; WASHINGTON D.C.; TO NAME A FEW.

ENER-RUN SUMMARY OF THE RULES

ENTRIES

ALL ENTRANTS AND NOMINATED DRIVERS MUST POSSESS A VALID DRIVER'S LICENSE OR INTERNATIONAL DRIVERS LICENSE.

CREW

THE CREW MUST CONSIST OF AT LEAST TWO AND NOT MORE THAN FOUR DRIVERS. DRIVERS WILL SHARE DRIVING DUTIES AT THEIR DISCRETION.

FEES

PRIVATE ENTRY FEES, ENTRIES MADE IN THE NAME OF AN INDIVIDUAL, WILL BE \$1,000.00. INSTITUTIONAL ENTRY FEE, ENTRIES MADE IN THE NAME OF AN EDUCATIONAL INSTITUTION OR GOVERNMENT BODY, WILL BE \$2,500.00. COMMERCIAL ENTRY FEES, ENTRIES MADE IN THE NAME OF A COMMERCIAL ORGANIZATION, WILL BE \$5,000.00.

THE "ENTRANT" MUST BE THE BONA FIDE LEGAL OWNER OF THE VEHICLE.

FOR ALL ENTRIES, THE FEE FOR EACH DRIVER WILL BE \$1,000.00. THERE IS ALSO A \$500.00 FEE FOR EACH SUPPORT CREW MEMBER.

INSURANCE

ALL DRIVERS AND SUPPORT CREW MUST BE COVERED BY PERSONAL ACCIDENT AND LIABILITY INSURANCE. THIS COVERAGE IS THE RESPONSIBILITY OF THE ENTRANT AND EACH REGISTERED INDIVIDUAL ASSOCIATED WITH THE RACE. COMPREHENSIVE VEHICLE INSURANCE AND PUBLIC LIABILITY INSURANCE ARE THE RESPONSIBILITY OF THE ENTRANT.

"CORRESPONDENCE TRACKING"

TYPE: ACTION DOCUMENT NUMBER: 9124151
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: GOLAY, Michael W.: PROGRAM FOR ADVANCED NUCLEAR POWER STUDIES

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 09/19/91

SUBJECT: A COPY OF THE, "PROCEEDINGS OF THE FIRST MIT
INTERNATIONAL CONFERENCE ON THE NEXT GENERATION OF
NUCLEAR POWER TECHNOLOGY" AND A REQUEST FOR IDEAS
REGARDING HOW TO ENHANCE THE VALUE OF THE SECOND MIT
INTERNATIONAL CONFERENCE ON THE NEXT GENERATION OF . . .

DIRECTORATE STAFF
ASSIGNED: PHYSICAL SCIENCES ASSIGNED:

ACTION STAFF
REQUIRED: AS NECESSARY ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 10/08/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
INTERNATIONAL/POLICY

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:

REMARKS: *Enclosure to Physical Sciences,
forward to DAB as necessary.*

CLOSED

OSTP RECEIVED: 09/24/91 FILE: P-PHYSICAL SCIENCES-ENERGY
DEPT RECEIVED:





**PROGRAM FOR
ADVANCED NUCLEAR
POWER STUDIES**

DEPARTMENT
OF NUCLEAR
ENGINEERING

MICHAEL W. GOLAY
PROGRAM
DIRECTOR

ROOM 24-215
TELEPHONES (617) 253-5824
(617) 253-5233
FAX (617) 258-8863

September 19, 1991

Allan Bromley
Science Advisor to the President
Office of Science and Technology Policy
Old Executive Building, Room 360
17th and Pennsylvania Ave, NW
Washington, DC 20506

Dear Dr. Bromley,

You may recall that the MIT Program for Advanced Nuclear Power Studies held the First MIT International Conference on the Next Generation of Nuclear Power Technology in October 1990. Its purpose was to stimulate a high level discussion of future use of nuclear power technology among leaders from the different organizations and constituencies likely to play major roles affecting how this technology is used.

The structure of the meeting utilized six topical sessions, a domestic United States discussion panel and an international panel. In each session keynote and respondent papers were used to introduce the major points concerning a major topic, and most of the session was devoted to a discussion among the attendees. The meeting was private, with attendance by invitation. The enclosed *Proceedings* contains the papers presented and synopses of the discussions.

I believe that the session papers and discussions are unusually thoughtful. They are likely to be of interest to those who are concerned with whether and how nuclear power can be broadly acceptable in the future. Because of your evident interest in these questions, I am sending you the enclosed copy of the *Proceedings*.

I hope that you will find this material interesting. If you would like any information about the MIT Program for Advanced Nuclear Power Studies, or if you have any comments concerning the First MIT International Conference on the Next Generation of Nuclear Power Technology, I would enjoy hearing from you.

Finally, I should note that our series of international conferences on future nuclear power technology is intended as a vehicle for stimulation of consensus regarding how to achieve a broadly acceptable technology. It is intended to foster the refinement of ideas and an intellectual community concerning this topic. The Second MIT International Conference on the Next Generation of Nuclear Power Technology is now being organized for October 13 and 14, 1992. Your ideas regarding how to enhance the value of this conference would be greatly appreciated.

Sincerely,

Michael W. Golay
Michael W. Golay
Professor of Nuclear Engineering
Director, Program for Advanced
Nuclear Power Studies

MWG:pjc

encl

RECEIVED
91 SEP 24 P 2
OFFICE OF THE
DIRECTOR



**PROGRAM FOR
ADVANCED NUCLEAR
POWER STUDIES**

DEPARTMENT
OF NUCLEAR
ENGINEERING

MICHAEL W. GOLAY
PROGRAM
DIRECTOR

ROOM 24-215
TELEPHONES (617) 253-5824
(617) 253-5233
FAX (617) 258-8863

September 19, 1991

Allan Bromley
Science Advisor to the President
Office of Science and Technology Policy
Old Executive Building, Room 360
17th and Pennsylvania Ave, NW
Washington, DC 20506

Dear Dr. Bromley,

You may recall that the MIT Program for Advanced Nuclear Power Studies held the First MIT International Conference on the Next Generation of Nuclear Power Technology in October 1990. Its purpose was to stimulate a high level discussion of future use of nuclear power technology among leaders from the different organizations and constituencies likely to play major roles affecting how this technology is used.

The structure of the meeting utilized six topical sessions, a domestic United States discussion panel and an international panel. In each session keynote and respondent papers were used to introduce the major points concerning a major topic, and most of the session was devoted to a discussion among the attendees. The meeting was private, with attendance by invitation. The enclosed *Proceedings* contains the papers presented and synopses of the discussions.

I believe that the session papers and discussions are unusually thoughtful. They are likely to be of interest to those who are concerned with whether and how nuclear power can be broadly acceptable in the future. Because of your evident interest in these questions, I am sending you the enclosed copy of the *Proceedings*.

I hope that you will find this material interesting. If you would like any information about the MIT Program for Advanced Nuclear Power Studies, or if you have any comments concerning the First MIT International Conference on the Next Generation of Nuclear Power Technology, I would enjoy hearing from you.

Finally, I should note that our series of international conferences on future nuclear power technology is intended as a vehicle for stimulation of consensus regarding how to achieve a broadly acceptable technology. It is intended to foster the refinement of ideas and an intellectual community concerning this topic. The Second MIT International Conference on the Next Generation of Nuclear Power Technology is now being organized for October 13 and 14, 1992. Your ideas regarding how to enhance the value of this conference would be greatly appreciated.

Sincerely,

Michael W. Golay
Michael W. Golay
Professor of Nuclear Engineering
Director, Program for Advanced
Nuclear Power Studies

MWG:pjc

encl

MIT.
Room -24233
27 March 1992
Cambridge, MA 02139

RECEIVED
91 SEP 24 P 2
OFFICE OF THE
DIRECTOR

THE WHITE HOUSE
WASHINGTON

October 28, 1991

Dear Professor Golay:

Thank you for providing me with a copy of the Proceedings of the First MIT International Conference on the Next Generation of Nuclear Power Technology. I am sorry that neither I nor Karl Erb, now my Associate Director for Physical Sciences and Engineering, were able to attend. Dr. Erb did attend the more recent MIT workshop on the direct cycle HTGR concept, however, and he told me the workshop was a great success. I hope you will continue to keep both of us informed of developments concerning advanced reactor concepts.

Sincerely,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley". The signature is fluid and cursive, with a long horizontal stroke extending to the left.

D. Allan Bromley
The Assistant to the President
for
Science and Technology

Professor Michael W. Golay
Professor of Nuclear Engineering
Director, Program for Advanced
Nuclear Power Studies
Department of Nuclear Engineering
Room 24233
Massachusetts Institute of Technology
77 Massachusetts Ave.
Cambridge, MA 02139

PROCEEDINGS OF THE
FIRST MIT INTERNATIONAL CONFERENCE
ON THE NEXT GENERATION OF
NUCLEAR POWER TECHNOLOGY



October 4-5, 1990

*Massachusetts Institute of Technology
Cambridge, MA 02139*

*Sponsored by
The Program for Advanced Nuclear Power Studies
Professor Michael W. Golay, Chairman*

THE WHITE HOUSE
WASHINGTON

November 29, 1991

Dear Professor Golay:

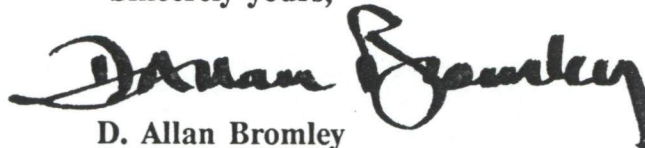
This is a much belated thank you for sending me a copy of the Proceedings of the First MIT International Conference on the Next Generation of Nuclear Power Technology. Because this is an area of technology that is of great interest to me and one where I believe that my office has substantial responsibility, I found these Proceedings to be extremely useful.

I am convinced that only the nuclear power option can provide the large blocks of electrical energy that our society will require in the decades ahead when environmental considerations will, in my opinion, make it increasingly difficult for us to justify or obtain approval for the construction of new fossil fueled plants. This places tremendous importance on the development of a new generation of advanced nuclear designs. My office is working closely with the Department of Energy and the Nuclear Regulatory Commission to try to ensure that work proceeds expeditiously on the new designs.

I would very much appreciate receiving from you the Proceedings of the Second MIT Conference held this past October as soon as these become available. In the meantime, I would only congratulate you on your initiative in organizing these conferences in such excellent fashion.

With all best wishes,

Sincerely yours,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley", written in a cursive style.

D. Allan Bromley
The Assistant to the President
for
Science and Technology

Dr. Michael W. Golay, Director
Program for Advanced Nuclear Power Studies
Department of Nuclear Engineering
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

"CORRESPONDENCE TRACKING"

TYPE: ACTION DOCUMENT NUMBER: 9124173
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: HAMILTON, J.H.: VANDERBILT UNIVERSITY

TO: DR. D.A. BROMLEY

CLOSED

DATE OF
CORRESPONDENCE: 09/16/91

SUBJECT: Request to give your support to the RIB facility at
ORNL in every way and a request for Karl Erb to
speak at the conference in Oak Ridge to celebrate 20
years of UNISOR and 10 years of the Joint Institute.

DIRECTORATE STAFF
ASSIGNED: PHYSICAL SCIENCES ASSIGNED:

ACTION STAFF
REQUIRED: FOR DAB'S SIGNATURE ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 10/01/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 09/24/91 FILE: 0-PHYSICAL SCIENCES-ENERGY
DEPT RECEIVED:

THE WHITE HOUSE
WASHINGTON

October 3, 1991

Dear Joe:

I share your concern about the future of the Holifield facility, given the pressures on the DOE budget and the fact that the Nuclear Science Advisory Committee (NSAC) assigned lower priority to the HHIRF than it did to HHIRF's competitors at Argonne and Berkeley. The only constructive solution that I can suggest is to work to convince the Congress to place higher relative priority on science than it has in the past. However, I would not support an effort to insert a project such as the ORNL RIB facility into the Federal budget prior to its review by NASC.

I regret very much that my schedule will prevent my participating in your symposium later this month. Karl Erb asked me to send you his regrets along with mine.

Sincerely,



D. Allan Bromley
The Assistant to the President
for
Science and Technology

Dr. J.H. Hamilton
Landon C. Garland Professor of Physics
Department of Physics and Astronomy
Vanderbilt University
Nashville, TN 37235

VANDERBILT UNIVERSITY



NASHVILLE, TENNESSEE 37235

TELEPHONE (615) 322-7311

91 SEP 24 3:37

Department of Physics & Astronomy • Direct phone 322-2828

OFFICE OF THE
DIRECTOR

September 16, 1991

Dr. Allan Bromley
Office of Science & Technology Policy
The White House
Washington, DC 20500

Dear Allan:

As Director of the Joint Institute for Heavy Ion Research in Oak Ridge, Chair of the Executive Committee of UNISOR, and a personal user of Holifield Heavy Ion Research Facility, I am deeply concerned about the future of HHIRF. The Department of Energy has not given sufficiently clear signals about their commitment to HHIRF's future to provide a basis for long range plans. This is especially disturbing when HHIRF can provide quickly the best intermediate radioactive beam facility in the world.

It was abundantly clear at the Belgian conference on Radioactive Ion Beams (RIB) in August, 1991, that HHIRF has the only proposal to provide quickly radioactive beams up to mass 85 at 3-10 MeV/A for a broad range of nuclear and astrophysical research. Moreover, the capital cost is so small, 3-5 million dollars, because HHIRF already has two accelerators and the well-shielded space between them to house a separator-ion source, that it is simply imperative for the U.S. to get a jump start in this important, new area which is of such broad and fundamental interest. Already, NSAC in its plans for the 1990's has identified this area as the next important new initiation for nuclear science. We must not let the Europeans take the lead in this area, too, when we have such a tremendous opportunity for such modest costs at HHIRF. Moreover, our new generation RMS on which contract negotiations are underway, at a cost of 3.6 million dollars including 1.1 million for the building, will be an essential device for a RIB facility. We already have the funds for this at HHIRF. I have been in contact with Senators Sasser and Gore and Congresswoman Lloyd to urge them to contact the Department of Energy to ensure that the DOE FY93 budget has funds to start a RIB facility at ORNL. I would urge you to give your support to this project in every possible way.

We appreciated your earlier interest in speaking at our conference in Oak Ridge to celebrate 20 years of UNISOR and 10 years of the Joint Institute. I have enclosed a copy of the program. If, by any chance, your meeting in Japan has been changed we would truly like to have you speak about the importance of university-national laboratory research and how this provides support for the individual researchers. If your schedule still does not permit, perhaps Karl Erb could come and speak. I know this is short notice, but we think this will be an important occasion. We expect Governor McWherter and members of the Tennessee Congressional delegation, as well as our Presidents and Chancellors to speak briefly. We hope one of you can come.

With very best regards.

Sincerely yours,

A handwritten signature in blue ink, appearing to be 'JH' or 'JH Hamilton', written in a cursive style.

J. H. Hamilton
Landon C. Garland Professor of Physics

JHH:plm

SYMPOSIUM ON REFLECTIONS & DIRECTIONS IN LOW ENERGY HEAVY-ION PHYSICS

October 14, 1991

9:00 A.M.	Welcome and Overview: J. H. Hamilton (Vanderbilt University)
	Remarks of Dignitaries
10:10	UNISOR History: E. F. Zganjar (Louisiana State University)
10:20	JIHIR History: L. L. Riedinger (Univ. of Tennessee, Knoxville)
10:40	International View of UNISOR & JIHIR: W. Greiner (Univ. Frankfurt, Germany)
11:45	Lunch
	UNISOR Overview: Spectroscopy Results --
12:45 P.M.	In the Seventies: A. V. Ramayya (Vanderbilt University)
1:10	In the Eighties: J. Wood (Georgia Inst. of Technology)
1:35	In the Nineties: B. Walters (University of Maryland)
2:00	On-Line Nuclear Orientation: N. Stone (Clarendon Lab., England)
2:25	Laser-Related Research: C. Bingham (Univ. of Tennessee, Knoxville)
2:50	Theory: W. Nazarewicz (Joint Inst. for Heavy Ion Research & Warsaw)
3:20	Coffee Break
3:45	High-Spin Spectroscopy: M. Riley (Florida State University)
4:15	Heavy-Ion Transfer: P. Butler (University of Liverpool, England)
4:45	HILI: C. F. Maguire (Vanderbilt University)
5:15	Entrance Channel Effects & Hot Dipoles: M. Thoennessen (Michigan State University)
5:45	Recent HILI Results: N. Cindro (Ruder Boskovic Inst., Yugoslavia)
6:00	Bar-B-Que
	Theory Month
7:00	C. Mahaux (University of Liege, Belgium)
7:30	J. Maruhn (University Frankfurt)
8:00	M. A. Nagarajan (Daresbury Lab., England)
8:30	End of Session

SYMPOSIUM ON REFLECTIONS & DIRECTIONS IN LOW ENERGY HEAVY-ION PHYSICS

October 15, 1991

	Nuclear Structure Theory at the Joint Institute
9:00 A.M.	A. Faessler (University of Tübingen, Germany)
9:35	J. Dudek (Centre de Recherches Nucleaires, France)
10:10	Coffee
10:40	K. Heyde (University of Gent, Belgium)
11:15	R. Wyss (Joint Institute for Heavy Ion Research)
11:50	D. H. Feng (Drexel University)
12:30	Lunch
	Future Directions
1:50	Nuclear Theory Center: R. Bengtsson (Oak Ridge National Lab.)
2:20	Recoil Mass Spectrometer: T. Cormier (Wayne State University)
2:50	Radioactive Ion Beams: J. Garrett (Oak Ridge National Lab.)
3:20	Astrophysics: A. Champagne (University of North Carolina)
3:50	Closing Remarks: J. H. Hamilton
4:00	End of Meeting

*Symposium on Reflections and Directions
in Low Energy Heavy Ion Physics
October 14-15, 1991*

SECOND AND FINAL ANNOUNCEMENT

Program

Reflections on the accomplishments in low energy, heavy ion physics, and emphasis on new directions and opportunities with low energy heavy ion facilities, highlight the program. This symposium celebrates twenty years of UNISOR and ten years of the Joint Institute for Heavy Ion Research. The meeting will begin on Monday, October 14 at 9:00am and end October 15 at 4:00pm, and will be held at the Joint Institute for Heavy Ion Research at Oak Ridge National Laboratory. Conference proceedings will be published by World Scientific.

Registration Information

A registration fee of \$75 is required to cover the reception, barbecue, lunches, morning/afternoon breaks, and proceedings. This fee is payable now or at the time of registration. Make checks payable in U.S. dollars to the Joint Institute (R & D Conference). A separate registration form is enclosed.

Transportation

The closest airport to Oak Ridge is in Knoxville, Tennessee (about 40 miles from Oak Ridge). Airport Shuttle Service of Knoxville located in baggage claim at the airport will be available. The telephone number is (615) 970-3351. Rates for pickup at airport and taken to Comfort Inn are as follows:

one-way - 26.00

Roundtrip - \$48.00

(3 or more people/trip - there is a discount)

-2-

Thrifty Car Rental has agreed to a special conference rate which can be obtained by requesting the LOCAL SPECIAL ACCOUNT. Advance reservations can be made. The telephone number is (615) 970-2277. The rates are as follows:

Sub-compact - \$160.00/week

Mid-size - \$180.00/week

Vans will be available to transport attendees from Comfort Inn to the Joint Institute and return. Please note your need for this on the registration form.

Lodging

Special rates have been arranged at Comfort Inn on Illinois Avenue, Oak Ridge, for the conference beginning October 13. You are required to make your own reservations directly. The telephone number of Comfort Inn is (615) 481-8200. The block of rooms will be lifted on September 30, so you are advised to make reservations now. A major credit card guarantee is required for arrivals after 6:00pm. You will need to mention that you are with the Vanderbilt Organization to obtain a reduced rate. Rates are as follows:

Single (2 double beds) - \$47.00

Double - \$54.00

Reception

There will be a reception on Sunday, October 13, at Comfort Inn from 6:00pm until 9:00pm. A registration table will be set up for your convenience.

Bar-B-Q

There will be a Barbecue on Monday at 6:00pm at the Joint Institute.

Companion Conference

The Second On-Line Nuclear Orientation Conference will be held October 16-19, 1991 at the Joint Institute for Heavy Ion Research. Invited speakers include: R. Bengtsson, T. Otsuka, K. Heyde, E. Hagn, D.H. Chaplin, P. Herczeg, H. Postma, J. Wouters, N.J. Stone, G. Goldring, and R. Neugart.

Organizing committee

The organizing committee for this celebration is F.E. Bertrand, H.K. Carter, D.H. Feng, J.H. Hamilton (Chair), L.L. Riedinger, and R.L. Robinson.

REGISTRATION FORMNAME _____
Last First Middle (No Initials)

AFFILIATION _____

MAILING ADDRESS _____
Street or P.O. Box
City Zip Code State or CountryTELEX _____ TELEPHONE _____
FAX _____ BITNET _____

CITIZENSHIP _____

I WILL NEED TRANSPORTATION FROM COMFORT INN TO THE JOINT
INSTITUTE AND RETURN. YES _____ NO _____I WILL NEED SPECIAL DIETARY CONSIDERATIONS. YES _____ NO _____
(If yes, please explain)INFORMATION REQUIRED FOR CLEARANCES FOR NON-US CITIZENS. PLEASE RETURN
BY FAX OR E-MAIL.DATE OF BIRTH: _____ PLACE OF BIRTH: _____
city/country

TYPE OF VISA: _____ VISA EXPIRATION DATE: _____

PASSPORT NUMBER: _____ PASSPORT EXPIRATION DATE: _____

PORT OF ENTRY: _____ HIGHEST DEGREE: _____

YEAR OBTAINED DEGREE: _____ MAJOR FIELD: _____

UNIVERSITY WHERE RECEIVED DEGREE: _____

Please return the completed form to:

Jackie Smith, Conference Secretary
Joint Institute for Heavy Ion Research
Oak Ridge National Laboratory
P.O. Box 2008
Bldg. 6008 MS 6-374
Oak Ridge, Tennessee 37831
DEADLINE: OCTOBER 1, 1991E-MAIL: SMITH @ ORPH01
FAX: (615) 576-5780

SYMPOSIUM ON REFLECTIONS AND DIRECTIONS IN LOW ENERGY HEAVY ION PHYSICS

OCTOBER 14, 1991

Introductory Remarks

UNISOR History: E. Zganjar (Louisiana State University)

JIHIR History: L. Riedinger (University of Tennessee)

International View of UNISOR & JIHIR: W. Greiner (University of Frankfurt, Germany)

Lunch

UNISOR Overview

Spectroscopy Results

In the Seventies: A. Ramayya (Vanderbilt University)

In the Eighties: J. Wood (Georgia Institute of Technology)

In the Nineties: W. Walters (University of Maryland)

On-Line Nuclear Orientation: N. Stone (Clarendon Laboratory, England)

Laser-Related Research: C. Bingham (University of Tennessee)

Theory: W. Nazarewicz (Joint Institute for Heavy Ion Research & Warsaw University)

High-Spin Spectroscopy: M. Riley (Florida State University)

Heavy-Ion Transfer: P. Butler (University of Liverpool, England)

HILI: C. Maguire (Vanderbilt University)

Entrance Channel Effects & Hot Dipoles: M. Thoennessen (Michigan State University)

Recent HILI Results: N. Cindro (Ruder Boskovic Institute, Yugoslavia)

Barbecue

Theory at the Joint Institute, Part I

C. Mahaux (University of Liege, Belgium)

J. Maruhn (University of Frankfurt, Germany)

M. Nagarajan (Daresbury Laboratory, England)

October 15, 1991

Theory at the Joint Institute, Part II

A. Faessler (University of Tübingen, Germany)

J. Dudek (Centre de Recherches Nucleaires, France)

K. Heyde (University of Gent, Belgium)

R. Wyss (Joint Institute for Heavy Ion Research)

D. Feng (Drexel University)

Lunch

Future Directions

Nuclear Structure Theory Center: R. Bengtsson (UNISOR/O.R.A.U.)

Recoil Mass Spectrometer: T. Cormier (Wayne State University)

Radioactive Ion Beams: J. Garrett (Oak Ridge National Laboratory)

Astrophysics: A. Champagne (University of North Carolina)

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9123932
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: COMPUTING DIALOGUE.

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 9/3/91

SUBJECT: ENCLOSED IS AN ARTICLE REGARDING FUTURE ENERGY
SHORTAGES.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE: STAFF DUE DATE
OSTP DUE DATE: DATE COMPLETED/DEPT:
DATE COMPLETED:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 09/09/91 FILE: P-PHYSICAL SCIENCES-ENERGY
DEPT RECEIVED:

PUTNAM'S GEOLOGY

FIFTH EDITION

Peter W. Birkeland
Edwin E. Larson

UNIVERSITY OF COLORADO

*Dear Sir; Please read about future energy Sept. 3, 1991
shortage of the world, for a Shale
Oil Retort Engineering Research
Center by Computing Dialogue Inc.*

Sincerely yours,

*Enclosures; Excerpts,
Putnam's Geology
Breeder Reactor*

COMPUTING DIALOGUE

#10H. 3 STUYVESANT OVAL

EAST 14th STREET

NEW YORK, NEW YORK 10009

NEW YORK OXFORD

OXFORD UNIVERSITY PRESS

1989

MINERAL RESOURCES AND THE FUTURE

It is difficult to determine the extent of the world's mineral reserves and potential resources and even more difficult to predict how long they will last. The life span of a resource depends on geological factors, advances in mining and extraction, new technological applications, the economic and political climate of the times, demand, and substitute materials. The figures in Table 19-2 provide a base for roughly estimating the life span of a known resource. The minimum number of years is the reserve base/production index (RB/P). Some reserves will be exhausted in the next 100 years. Gold and silver are already in short supply and

there seems to be sufficient uranium for only about a generation.

How does the United States fare with respect to the minerals needed to run its industries? Using for the United States the same analysis as for the world, we see in Table 19-3 that reserves of many important minerals will be exhausted in less than 100 years. The United States relies on many imports at present (Fig. 19-14), and this has both positive and negative aspects. On the positive side, imports extend the life of our own resources and provide income for the exporting nations. On the negative side are the problems of the trade deficit, and the political reality that once friendly countries may not always remain friendly and may at

Table 19-3 Reserve Base, Production, and Reserve Base/Production Index for the United States for 1984 and 2005

	Reserve Base ^a	Average Annual Production ^{a,b}	Reserve Base/Production Index 1984 (RB/P)	Production ^{a,b,c} 1985–2005 ^c	Remaining Reserve Base ^a 2005	Reserve Base/Production Index 2005 (RB/P)
Magnesium	∞	132	∞	2,772	∞	∞
Vanadium	2,400	5	480	105	2,295	459
Silicon	Very large	481	Very large	10,101	Very large	Very large
Iron ore	24,800,000	74,684	332	1,568,364	23,231,636	311
Nickel ^d	2,800	12	233	252	2,548	212
Zinc	53,000	384	138	8,064	44,936	117
Tungsten	320	3	107	63	257	86
Molybdenum	5,900	57	104	1,197	4,703	83
Lithium	460	6	77	126	334	56
Copper ^e	90,000	1,433	63	30,093	59,907	42
Lead	27,000	559	48	11,739	15,261	27
Aluminum	12,000	356	34	7,476	4,524	13
Tin	55	small	~50	50?	5	5?
Mercury	200 ^f	26 ^f	8	546 ^f	0	0
Antimony	100	13	8	273	0	0
Chromium	0	0	0	0	0	0
Manganese	0	0	0	0	0	0
Cobalt ^g	—	0	—	0	—	—

^aThousands of tons, except mercury.

^bPrimary metal production.

^cAssuming average rate of production is equal to the 1974–84 average. Exception mercury, for which the 1979–84 average is used.

^dOnly 150,000 tons of the reserve base is currently ore.

^eReserve base includes a large amount of high-cost copper, currently uneconomic.

^fThousands of 76-pound flasks.

^gThe reserve base for cobalt is given by the U.S. Bureau of Mines as 950,000 tons. None is economic at present, and "most domestic resources are in subeconomic concentrations that will not be economically usable in the foreseeable future."

Data for 1984 from U.S. Bureau of Mines, Mineral Commodity Summaries. After E.N. Cameron, 1986, *At the Crossroads—the Mineral Problems of the United States*, Wiley, N.Y., p. 182.

RESOURCES AND SOCIAL ISSUES

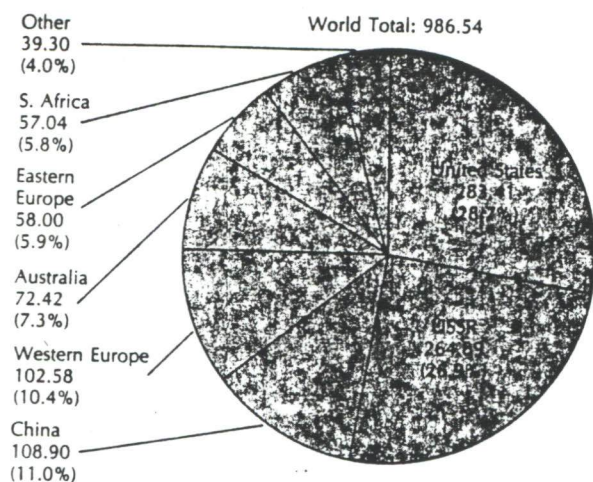


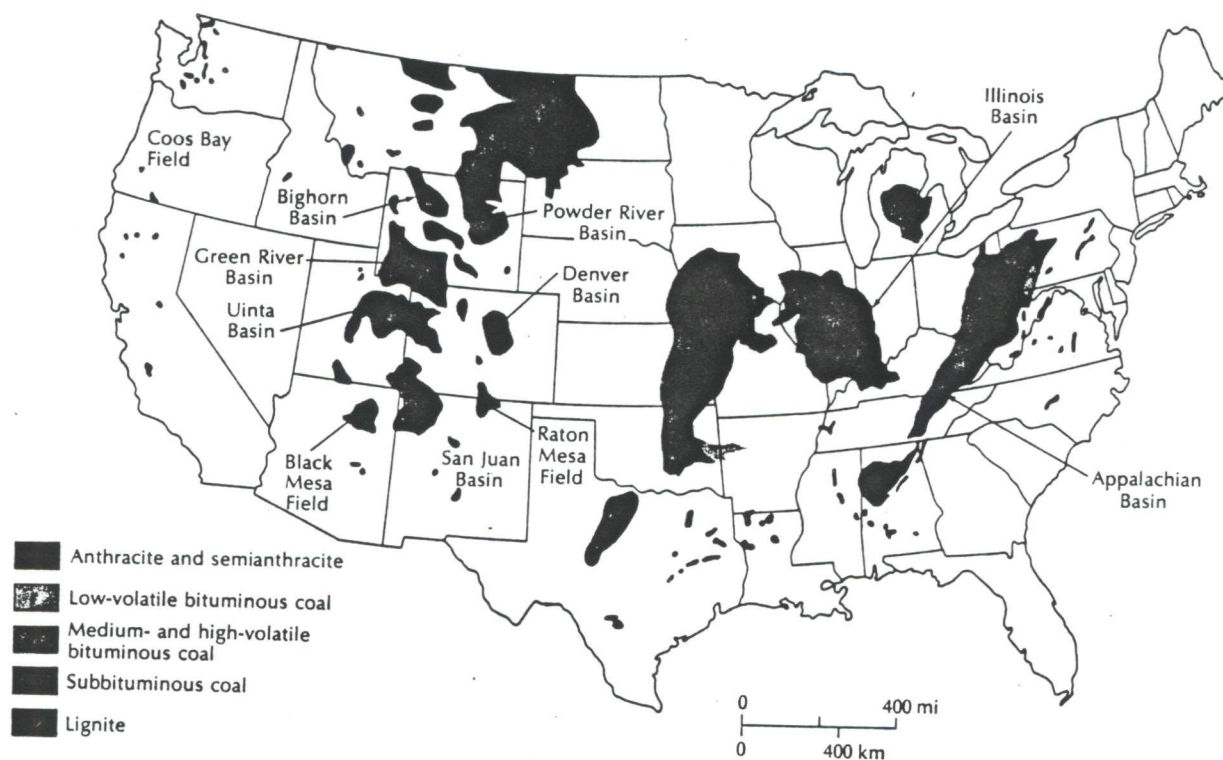
Fig. 19-18. Estimated recoverable coal reserves of the world, 1980, in billions of tons. (Energy Information Administration, 1985)

appropriately points out that supplies of coal are plentiful today because for 60 years no growth took place in the coal industry. Had we continued at the pre-1910 growth rate, we would be out of coal by the end of this century.

Oil

The outlook for oil is worse than that for coal. Distribution is uneven and the resources and proved reserves lie mainly outside the Western Hemisphere (Fig. 19-21). Even so, the demand for oil in the United States as well as in other countries continues to grow, and what we do not produce ourselves we import at sometimes wildly fluctuating prices. In the United States the time of peak production has passed. The discovery of large reserves in Alaska is important, but, put in per-

Fig. 19-19. Various grades of coal deposits in the United States. (U.S. Department of the Interior)



RESOURCES AND SOCIAL ISSUES

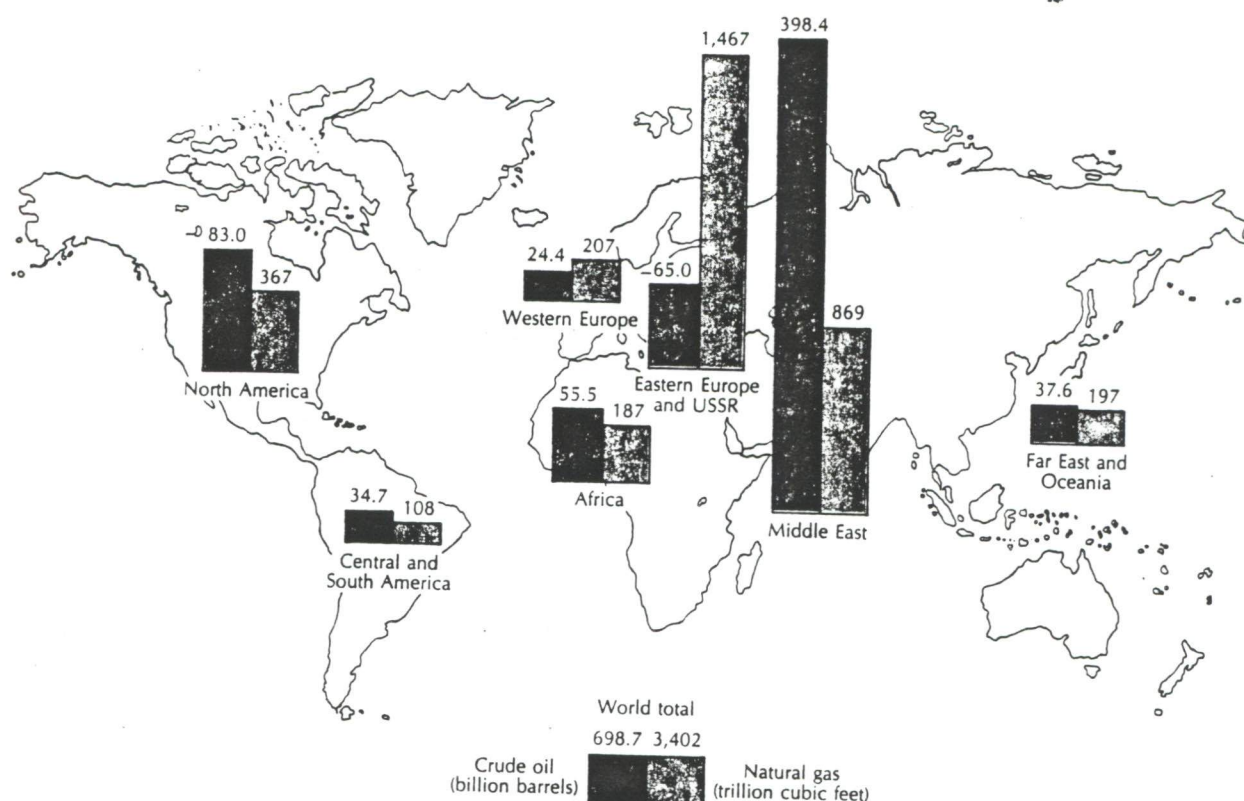


Fig. 19-21. Proved crude oil and natural gas reserves, 1984, for regions of the world. One billion barrels of oil are equal to approximately 5.3 trillion ft.³ of natural gas. (Energy Information Administration, 1985)

optimism of government, industrial, or academic planners can add to our natural resource base.*

Tar sands and oil shales as oil sources are largely untapped. The estimated resource oil in tar sands is large—some 2.5 to 6 trillion barrels, which is considerably more than the Middle East resource. Oil shales in the United States yield between 10 and 65 gallons per ton of rock; in some thin layers the yield may be as high as 140 gallons per ton (42 U.S. gallons = 1 barrel). On average, the yield is close to 1 barrel of oil from 2 tons of rock. Present-day reserves in the United States are about 80 billion barrels; the potential resource could be 2 trillion barrels or more. For the world the known resource of the higher grade rocks is about 910

billion barrels; this, however, is only 4 percent of the estimated total resource of higher-grade rocks, and the latter is only 1 percent of the estimated total resource of all grades of oil shale. The figures are staggering; for example, the estimated amount of oil in the highest grade rocks is eight times the estimated world oil resources. Low world oil prices at present have not made this petroleum resource, which is expensive to extract, very attractive.

Natural Gas

World proved natural gas reserves are large (see Fig. 19-21), amounting to about 63 times the 1982 production of 1.5 trillion m³ (54 trillion ft³). In the United States production peaked in 1972–73 and has declined since. Proved reserves and undiscovered recoverable resources are estimated at 23 to

*E.T. Hayes, 1979, Energy resources available to the United States, 1985 to 2000, *Science*, vol. 203, pp. 233–34.

25 trillion m^3 (800 to 900 trillion ft^3), or 44 to 50 times the 1982 production of one-half trillion m^3 (18 trillion ft^3).

Fossil Fuels in Agriculture

Today the agricultural industry consumes more petroleum than any other industry in this country—a fact that is probably not well known. Oil is used for running machinery on the farm, pumping water for irrigation, manufacturing and distributing fertilizers and pesticides, and transporting foodstuffs. The energy requirements of high-technology agriculture, or agribusiness, are so high that there is some question as to how long it can continue.

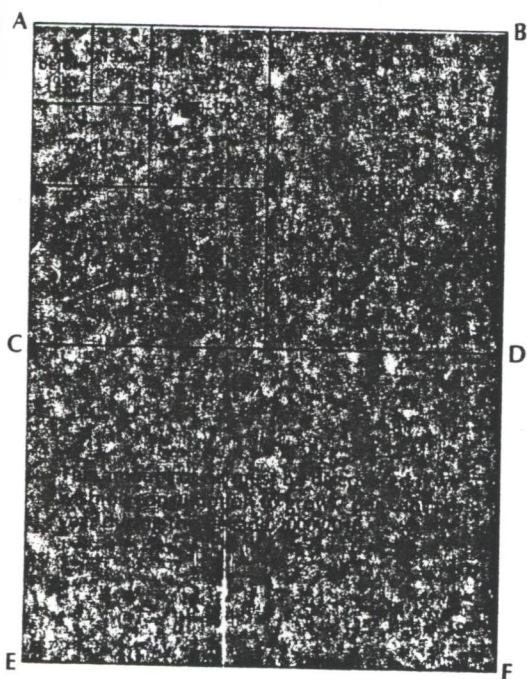


Fig. 19-22. Relative amounts of oil used each decade as a result of a 7 percent annual increase in consumption. At this rate the time required to double consumption is a decade; the diagram clearly shows that the quantity consumed in any one decade is equal to the total of all preceding years. For example, the amount represented by rectangle CDFE is equal to that represented by ABDC. Hence production must double each decade to match consumption. The area of ABDC is an approximate representation of the known world oil reserve. (After Bartlett, 1980, "Forgotten Fundamentals of the Energy Crisis," *Journal of Geological Education*, vol. 28, pp. 4–35, from M. Iona, 1977)

For example, it was recently estimated that the equivalent of about 112 gallons of gasoline was required to grow the food for the average American. If the world were to eat the way Americans eat and use our technology to grow their crops and produce their livestock, the world oil reserve would be depleted in less than 50 years. Or, put in a different way, by the end of the next population doubling (41 years), the percentage of people starving would remain the same, but the actual number would have doubled. Data presented by Worldwatch Institute show that the annual growth in energy use for world agriculture is over 3 percent.

The Environmental Cost of Fossil-Fuel Use

The use of fossil fuels has been at the cost of some environmental degradation and, as their consumption increases, we must be watchful that the environment does not degrade further. The problems have to do with both the land surface and the atmosphere.

Most people are aware of the unsightly pits and spoil-piles left by the surface mining of coal. Large sums are being spent to landscape and revegetate the sites, with some success.

If the United States begins to extract large amounts of oil from its extensive oil shale deposits, the environmental impact could be massive. When the oil company Exxon announced plans for an oil shale plant with an output of 47,000 barrels per day, it was estimated that processing that amount would require roughly 94,000 tons of rock per day. President Carter had hoped for an industry producing 400,000 barrels per day (about 800,000 tons of rock per day) by 1990. Going one step further, to obtain all of our oil from shale means the processing of 13 billion tons of rock per year or 130 million freight-train cars full. Bartlett makes another calculation of the volume of rock that must be handled: to extract 1 million barrels of oil per day requires the processing each nine months of an amount of rock equivalent to that removed in building the Panama Canal. To put this into proper focus, the United States currently uses about 16 million barrels of oil each day.

The problems involved in processing oil shales are formidable. Considerable amounts of both water

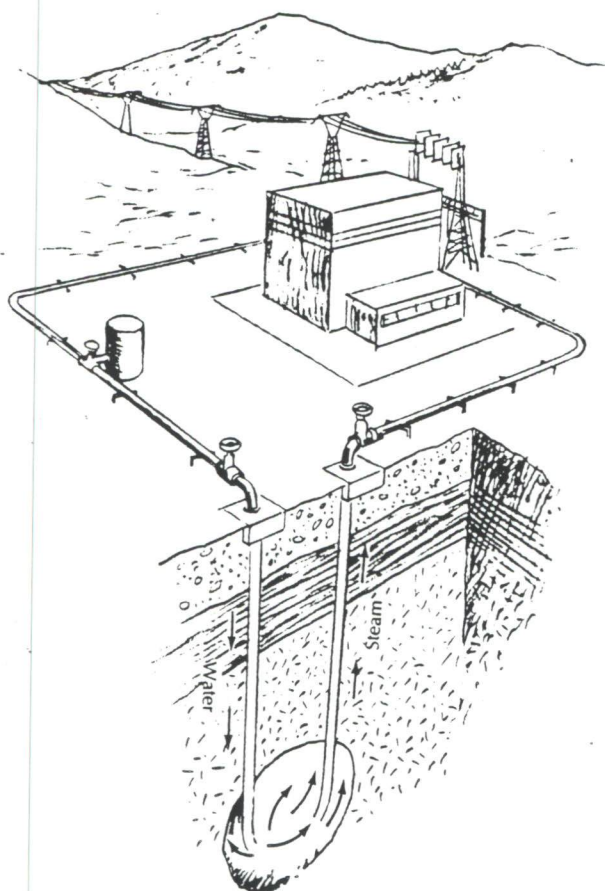


Fig. 19-23. Drawing that shows the concept of extracting geothermal energy from dry hot rock. The arrows indicate directions of the water and steam flow. (From the University of California, Los Alamos Scientific Laboratory, 1979)

provide 21 percent of the total and by 2000 as much as 60 percent of the total. These predictions, however, have not been met, for in 1986 only about 16 percent of our electricity was generated by nuclear power. In some Western European countries, however, nuclear power accounts for up to 65 percent of the electricity generated. Here we will investigate briefly how nuclear power is generated and the problems that the use of nuclear energy poses.

Nuclear energy derives from two reactions, fission and fusion. Fission in a nuclear reactor is

achieved by bombarding uranium atoms with neutrons (Fig. 19-24), which produces lighter fission fragments, or different atoms, and at least two neutrons. The neutrons, in turn, encounter other uranium atoms, and the fission process is repeated. If continued, a chain reaction, such as that in an atomic bomb, occurs. Fusion, on the other hand, is just the opposite, that is, two light particles fuse, or join, to form a heavier element (Fig. 19-24). This same process fuels the sun, where hydrogen atoms fuse to form helium atoms, a reaction similar to that in the hydrogen bomb. The fusion reaction is considered by some the best possible energy source because hydrogen is so abundant, but the technology of controlling the reaction so that it can be used safely has not been worked out. However, fusion has the distinct advantage over other nuclear reactions of leaving very little radioactive waste as a by-product.

In both fission and fusion reactions, energy is released. This energy can be used to heat water, produce steam, and generate electricity, but only if the reaction is controlled. Because fission of uranium can be controlled, it has become the basis for our present nuclear power plants. The advantage of using uranium is that only small amounts of it are needed to produce the same amount of energy produced by large amounts of fossil fuels.

Of the three different isotopes used in nuclear reactors, only uranium-235 occurs naturally. Uranium ores, however, contain only 0.7 percent of uranium-235. If we continue to fuel U.S. power plants with uranium-235, our supply will probably run out before the end of this century—even though the element is plentiful in the United States.

One way to supplement our limited supplies of naturally occurring nuclear fuels is to create fissionable material artificially. This can be done by neutron bombardment of uranium-238 and thorium-232—both of which are more abundant in nature than uranium-235—to create the fissionable products plutonium-239 and uranium-233, respectively. Because the reaction produces more fissionable material than it starts with, it is said to "breed" new material, hence reactors based on this reaction are called breeder reactors. Many technological problems have to be overcome, however, before breeder reactors can be used to

S.E. Hux

Nuclear Physics
for Engineers
& Scientists
1987

graphite matrix which provides additional moderation. The design output temperature is of the order of 1000°C and, since carbon dioxide would be too corrosive at this temperature, cooling is by inert helium gas at a pressure of about 20 atm. The small HTR at Winfrith was commissioned in 1965 but closed down in 1976 when it became clear that the HTR was unlikely to play a major role in the UK nuclear power programme. In the USA a small 40 MW(e) HTR was commissioned at Peach Bottom, Philadelphia, in 1967 and a much larger HTR of 340 MW(e) became operational at Fort St Vrain, Colorado, in 1977 but its operational performance has been disappointing. There is a continued interest in a modification of the HTR the 'pebble bed' reactor in Germany. The fuel in this reactor type consists of small pellets of highly enriched uranium oxide or uranium carbide about 0.5 mm in diameter and coated by two layers of pyrocarbon, and one of silicon carbide. About 4000 such pellets formed into a sphere 6 cm in diameter and coated in pyrolytic carbon form the 'pebble' or basic fuel element. Fresh 'pebbles' are fed into the top of the reactor and spent ones are extracted from the base, as illustrated in Fig. 14.3. Like the HTR, the 'pebble bed' reactor is helium cooled and the graphite envelope of the 'pebbles' reduces the escape of gaseous fission products to a few parts per million for the operating fuel surface temperature of 950°C . Primary containment of the reactor is by a prestressed concrete pressure vessel which contains the heat interchangers. The reactor is controlled by boron steel rods which move easily through the spherical fuel elements.

A small 'pebble bed' reactor, AVR, with an electrical output of 15 MW(e) and containing about 100 000 spherical fuel elements has been

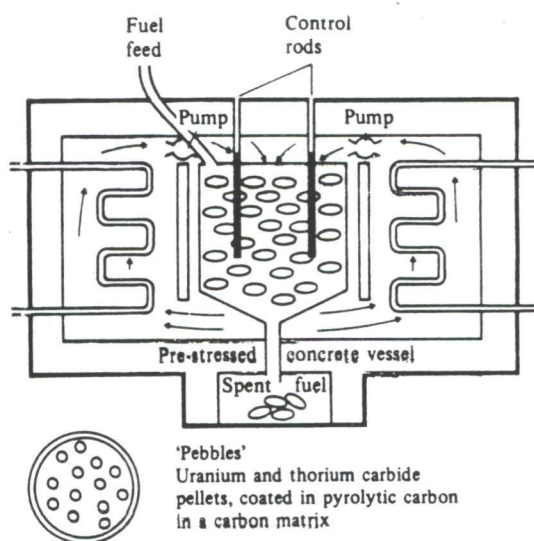


Fig. 14.3. A 'pebble bed' HTR.

14]

high pressure water reactor

PWR: pressurized water reactor

Commercial reactor types

307

in operation in FRG since 1966 and a larger plant THTR of electrical output 300 MW(e) and containing 650 000 'pebbles' is currently being commissioned. The design of a 500 MW(e) version of the 'pebble bed' reactor is under consideration as an alternative to PWRs for future nuclear power programmes in FRG.

In the THTR, by incorporating thorium in the fuel pellets, ^{233}U is produced by the neutron capture process



This is a fissile isotope of uranium which does not occur in nature but which replaces some of the ^{235}U used in the fission process. The thorium cycle will be discussed in more detail in Chapter 15.

One great attraction of the 'pebble bed' reactor, and of the HTR generally, is that the very high gas outlet temperatures would allow these reactors to produce heat to be used directly for industrial processes, 'process heat', as well as for the generation of electricity.

Water-cooled reactors

Canadian Deuterium moderated Natural Uranium

Pressurised heavy-water-cooled reactors (CANDU)

As indicated in Chapter 12, if natural uranium is used as fuel, there are only two feasible moderators, graphite and heavy water, and the Canadians developed a reactor type, CANDU, using heavy water as both coolant and moderator. A demonstration power reactor, NPD, of this type was completed at Des Joachins in Ontario in 1962. This is a comparatively small reactor producing 83 MW(th) and 19.3 MW(e) and consists of natural uranium oxide fuel elements mounted in horizontal tubes through which heavy water (D_2O) is pumped at a high pressure. The pressure tubes are surrounded by a tank or 'calandria' containing heavy water at atmospheric pressure and it is here that most of the neutron moderation takes place. The system is illustrated diagrammatically in Fig. 14.4. The heat generated in the fuel elements is transported by the heavy water to a heat interchanger where it is transferred to a pressurised ordinary (light) water circuit to raise steam and to drive turbine in the conventional manner.

CANDU reactors are controlled by absorbing rods containing cadmium and have cadmium shut-down rods but also possess an additional safety feature in that, should the power level increase above a predetermined value, the moderator can be emptied into a dump tank. In the absence of a moderator, neutrons cease to be preferentially captured by ^{235}U and the reactor rapidly becomes subcritical. The latest models dispense with this and have instead provision for injecting a neutron-absorbing solution of gadolinium or 'poison' into the moderator as an alternative reserve safety

graphite moderated fuel rods
cooling & heating
fuel

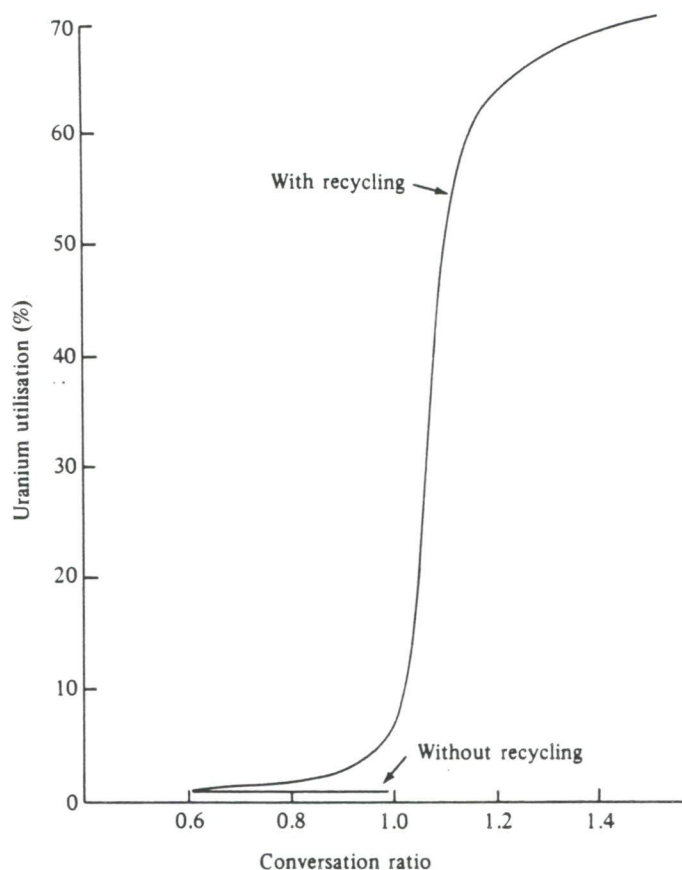
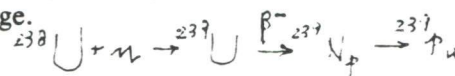


Fig. 15.3. Fuel utilisation as a function of conversion ratio.

recycled through FBRs. Fission fuel reserves under these conditions would be virtually unlimited and available to any country with a coastline and cause little or no environmental damage.



FAST BREEDER REACTORS

The FBR differs from other reactor types in that it has a small highly enriched core with no deliberate moderation and is surrounded by a breeder blanket of fertile material, typically depleted uranium, i.e. uranium from which most of the fissile ^{235}U had been removed by its previous use as fuel in conventional reactors. The blanket is thus mainly ^{238}U in which plutonium is produced by neutron capture and subsequent β decay in the previously described breeder reaction

Since the core is small and highly enriched, a large proportion of neutrons are allowed to escape and the amount of plutonium produced in the breeder blanket exceeds the amount of fissile material consumed in the core to give overall conversion ratios up to about 1.2.

The importance of the FBR to the long-term future of nuclear power was appreciated from an early date and the first experimental fast reactor, Clementine, with a thermal power of only 25 kW was operating in the USA in 1946.

The first FBR of significant size to produce electricity was the DFR which first operated at Dounreay in Scotland in 1959 with a thermal power of 60 MW(th) and an electrical power of 14 MW(e). Details of this reactor are briefly as follows. The central core contained fuel elements enriched to 46.5% of ^{235}U and clad in niobium. These formed an hexagonal array 0.54 m in diameter and 0.54 m long, the total mass of uranium being only 220 kg. The breeder blanket contained about 20 tons of depleted uranium..

The production of 60 MW of heat in a volume of 0.5 m³ required a rather special heat transfer system, and the core was cooled by pumping a mixture of molten sodium and potassium through tubes or loops traversing the core and also the breeder blanket where some 12 MW of heat were produced. The liquid metal coolant was then passed through heat interchangers, raising steam in a secondary water circuit to produce electricity. The reactor was contained in a cylindrical double-walled vessel 3.2 m in diameter and 6.4 m long surrounded by a biological shield which in this case was borated graphite rather than the more usual concrete. The DFR is illustrated in Fig. 15.4. The reactor was shut down in 1977 after 18

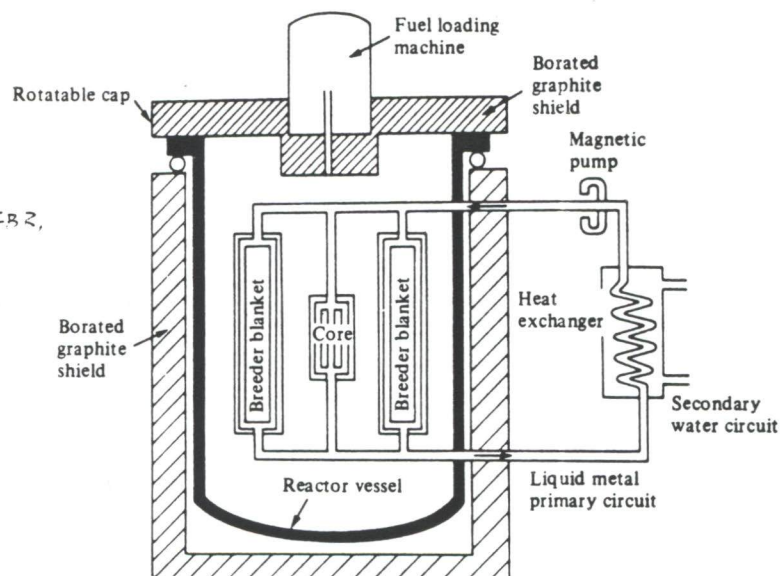


Fig. 15.4

+ Loop-type FBR,
DFR.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9123620
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: AGNEW, Harold M.

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/23/91

SUBJECT: RE: NAS "OBJECTIVITY AND OPENNESS".

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: PHYSICAL SCIENCES
D. Allan Bromley

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 08/28/91 FILE: P-PHYSICAL SCIENCES-ENERGY
DEPT RECEIVED:

3620
HAROLD M. AGNEW

322 PUNTA BAJA DRIVE
SOLANA BEACH, CA 92075

(619) 481-8908

August 23, 1991

RECEIVED

91 AUG 28 - A 9:20

OFFICE OF THE
DIRECTOR

Dr. Allan Bromley
Science Advisor
Office of Science & Technology Policy
Executive Office of the President
Washington, D. C. 20500

Dear Allan,

So much for NAS objectivity and openness. Hope to see you
next month.

Sincerely,



Enc.

HAROLD M. AGNEW

322 PUNTA BAJA DRIVE
SOLANA BEACH, CA 92075

(619) 481-8908

August 23, 1991

Dr. Frank Press
President
National Academy of Sciences
2101 Constitution Avenue
Washington, D. C. 20418

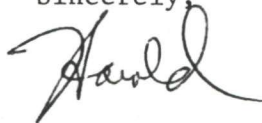
Dear Frank,

I was surprised to receive a letter from Peter Raven dated 8/16/91 a copy of which you also received. A couple of weeks ago I received a letter from you describing the new "E" mail service. It also stated "Any member who wishes to read a draft report may do so - subject, of course, to the usual strictures governing confidentiality." I consequently called 1-800-452-4848 as suggested in the referenced letter and asked to receive a copy of "Nuclear Power: Technical & Institutional Options for the Future." I didn't ask to be a reviewer. I simply asked to read the report as outlined in your "E" mail news letter. I gather from Haven's letter that since I am a proponent of the HTGR technology I shouldn't receive a copy of the report. I have no financial interest in the HTGR but am a proponent of inherently safe nuclear systems. I recall that when you were serving President Carter you wrote a letter to the OMB supporting developing of the HTGR because it is the only inherently safe nuclear power source on the horizon. All other systems are either passively safe or run-of-the-mill old water technology.

I guess that Sannders MacClane was correct when at the last NAS meeting he blasted the Academy for its report record. This appears to be another report chaired by a non-academy member with a non-majority of academy members on the committee and not available to interested Academy members until it is released. Something is really rotten in your shop. I trust you won't blame it on the NRC again.

I thought that the DOE asked the NAS to conduct the study not the NRC. I'm enclosing a couple of articles which explain again, although I believe you understand the problem even if the panel doesn't wish to face up to it, the potential vulnerability of all high power density light water reactors.

Sincerely,



cc: Peter Raven
Allan Bromley
Bob Richardson
Dominic Monetta

Nuclear power can be safe

SOLANA BEACH

During the past decade, there has been concern worldwide with regard to Iraq's real objectives in its extensive nuclear-research program.

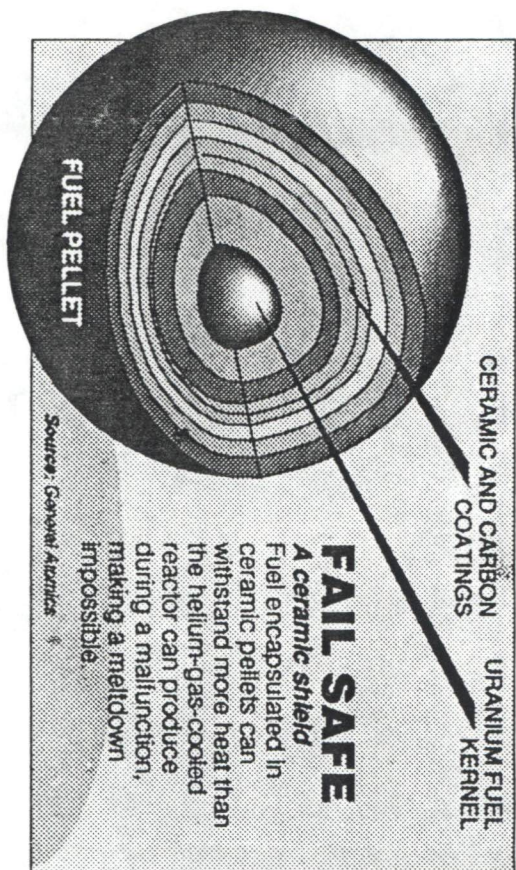
More and more, it became apparent that Iraq's objective was to develop a nuclear weapons capability. An attack on its early facilities by Israel set Iraq back, but did not deter it in striving for its primary objective of becoming a nuclear-weapons power in the Middle East.

As a result of the U.N. military action in

By HAROLD M. AGNEW

the Persian Gulf, Iraq's weapons-production facilities have been destroyed. It is fortunate that it did not have an operational nuclear-power plant. Had such an operating power plant been attacked and even if during the attack the reactor vessel and the secondary-containment vessel were not breached, an event not too dissimilar from

Harold M. Agnew is a former director of Los Alamos Scientific Laboratory and a former president of General Atomics in San Diego, where a modular high-temperature gas-cooled reactor of advanced design is being developed.



FAIL SAFE

Fuel encapsulated in ceramic pellets can withstand more heat than the helium-gas-cooled reactor can produce during a malfunction, making a meltdown impossible.

Source: General Atomics

the catastrophe at Chernobyl might have ensued.

A tremendous amount of energy is produced in the fuel rods of a nuclear-power reactor even for hours after the plant has been shut down. To prevent this energy from melting the fuel rods and causing what has been called a meltdown, existing light-water reactors require a continuous flow of water to remove the heat (energy) from the fuel rods.

This water must circulate to remove the heat. The circulation is achieved by electrically driven pumps. An external source of electrical power is required to drive the pumps when the reactor is shut down and not generating electricity. Emergency on-site diesel generators are normally the source of this electrical power. In peacetime, these sources are adequate. However, the electrical and/or diesel fuel supply to all reactor stations is vulnerable in the event of a war. A deliberate attack as was carried out in Iraq could easily interrupt such supply. Without the power to provide circulating water, the water would evaporate, the fuel rods would overheat, melt and react with steam and water within minutes. A tremendous steam pressure in the reac-

tor vessel would develop, which would vent to the secondary-containment vessel. Depending on the severity and speed of the energy buildup, it is conceivable that the secondary containment also would be breached and a Chernobyl-type accident would be repeated, causing a huge area of radioactive contamination.

These events could ensue independent of

The fuel cannot melt at any temperature the system can reach.

the expertise of the operators or the excellence of the design and construction of the existing water-cooled reactor systems.

The developing nations are in dire need of electrical energy. Without it, they will never develop. Most of them have no indigenous fossil-fuel sources. Many of them have been stripping their forests of wood to burn and are creating man-made deserts.

It was thought that nuclear power could

in the future be an attractive option for these developing nations. However, if these nations — in addition to all their other problems — and the rest of the world have to worry about armed conflict on their territory, a legitimate question would be: "Is nuclear power really an option that we can risk in these areas?"

The answer, strong as it might seem, is yes, but not through deployment of water-cooled reactor technology now in being.

A recent shutdown from full power of a full-scale helium-cooled graphite reactor in Germany, with no external removal of heat, clearly demonstrated that an inherently safe nuclear-power reactor can be made. The whole shutdown sequence was presented on a NOVA program on the Public Television Network.

Several unique design features provide this inherent safety, characteristic for helium-cooled graphite reactors. The fuel is refractory-clad and cannot melt at any temperature the system can achieve. The maximum temperature is determined by geometry, power and power density of the system, the large heat capacity inherent in the graphite moderator and ability of the system to conduct and radiate the heat to the surrounding environment.

Fortunately, the typical size of such a reactor system, about 400 megawatts thermal (150 megawatts electrical), would be optimum for developing nations, as they do not have the necessary infrastructure to transmit power throughout their territories.

The inherent safety features of the system do not require the high level of skilled operators or maintenance workers demanded in current existing water-cooled reactors. The reactor also is small enough to be factory-fabricated and certified, and to be sited below ground level.

Needing no external power to maintain integrity, in event of a hostile action, the safety of the public in the surrounding regions is assured. No other nuclear-reactor system has the inherent safety features of this system, known as the modular high-temperature gas-cooled reactor (MHTGR).

If nuclear power is ever to regain public confidence worldwide, it will have to be based on the inherent safety characteristics of the MHTGR. No other system can meet its safety characteristics in peace or war. □

A-Plant Failure Confused Operators

By MATTHEW L. WALD

Special to The New York Times

SCRIBA, N.Y., Aug. 14 — After a power failure disrupted the control room of a nuclear plant here on Tuesday, the operators had difficulty determining which instruments were still working and which were not, the Nuclear Regulatory Commission said today. And in at least one case, the commission said, the operators reached the wrong conclusion.

But officials said today that beyond the damage to electrical systems that occurred when problems began at the Nine Mile Point Nuclear Station, there was no damage to the nuclear fuel or other parts of the reactor and no radiation escaped from the plant.

As officials of the Niagara Mohawk Power Corporation debriefed the five operators on duty when the power failure hit yesterday morning, a team from the Nuclear Regulatory Commission began its investigation.

At First, an Unknown Risk

Both Federal and utility officials said early indications were that the actions of the plant's operators were proper, including the decision to declare the second-most serious type of emergency in the official Federal ranking. It was only the third time that such an emergency had been declared since the

ranking was developed 12 years ago.

Edward Jordan, the Commission's senior reactor safety expert, said that when the incident began, "no one knew what the risk was" because no one was certain exactly what was happening.

The plant's chief engineer, Richard B. Abbott, said the control room personnel did not immediately recognize that the reactor and the steam turbine had automatically shut down. He said he was confident that the crucial automatic shutdown system had worked. But this will be difficult to prove, he said, because the computer system that engineers rely on to record each event and action in the plant was also knocked out by loss of power. Asked about the level of seriousness of the failures, he said, "It's not a comfortable feeling for the operators, by any means."

Mr. Jordan said the operators had been misled by a meter that said — correctly, as it turned out — that the strength of the nuclear reaction in the core was declining — a sign that the reactor was shutting down; they concluded that the meter itself was failing.

When power is lost in a control room, Mr. Jordan said, "One instrument fails up-scale, and another fails down-scale, and then you have a problem." He said one instrument might give its maximum reading and another its minimum, its position offering no clue about whether it was working.

The operators knew that they had lost parts of the monitoring system known as annunciators, which are small plastic panels that are lighted and set off chimes or bells when a pump, valve or other part malfunctions, because they saw some lights go out, he said, and they knew that they had lost the use of a display that tells them the approximate location of the 185 control rods that shut off the nuclear reaction. But among the hundreds of other indicators on their control panel, they did not know which they could trust, he said.

'Cold Shutdown'

Among the systems lost in the blackout were the radiation monitors outside the plant, so the company dispatched two teams with radiation detectors to patrol outside the fence.

The plant, New York State's newest and largest reactor, on the shore of Lake Ontario about six miles northeast of Oswego, reached "cold shutdown" late Tuesday, a condition where the cooling water is below boiling temperature at atmospheric pressure — a condition where it is extremely unlikely that anything could go wrong. At that point the emergency declaration was lifted.

The Institute of Nuclear Power Operations, an industry group in Atlanta, released information on the incident to all American reactor operators, but the Nuclear Regulatory Commission has not yet offered advice or ordered changes for the 110 other operating plants around the country.

A team of seven from the Commission, including one specialist in emer-

gency preparedness and another in "human factors," arrived here last night, and about 20 people from Niagara Mohawk were also investigating today. The primary question is how five power systems failed. Joseph Fouchard, a Commission spokesman, said Wednesday that the systems "were supposed to be non-interruptible."

The systems are supplied three ways. After electricity is produced at Nine Mile Point 2's generator, most goes through a bank of three transformers that boosts the voltage and sends the power out to the state's electric transmission system. But before reaching the main transformer bank, some electricity is diverted through a separate transformer and reduced in voltage for use on the site. That electricity goes through another transformer, dropping the voltage further, and then to an "uninterruptible power source," a kind of pool from which several systems are fed.

If the main flow to the pool stops, electricity is supposed to flow in from a

The failure was like a karate chop to the control room's face.

second, independent source. If that fails, a bank of batteries is supposed to kick in. But both of these alternates, which are supposed to begin in a tenth of a second, failed.

The event that started the power failure was an electrical fault in one of the three main transformers, which sent some kind of voltage change deep into the system. Like a karate chop to the face, it knocked out part of the control room.

An Important Question

The plant has other uninterruptible power systems that continued to work, supplying power to instruments that, among other things, show the level of water in the reactor vessel and the pressure.

An important question for the company and the Nuclear Regulatory Commission is whether the uninterruptible power supply that serves those safety-related instruments could also be interrupted. Mr. Abbott said those systems were fed not by the plant's output, but by power from the outside grid, and that the initial belief is that the hardware used in those systems is superior. But a full evaluation will take weeks, he said.

Another issue, he said, is whether the plant had operated outside the range of events it was designed for. The first problem, the faults in a main transformer, usually occurs several times a year in nuclear plants around the country, although never before with the result observed on Tuesday.

THE SAN DIEGO UNION

Wednesday, August 14, 1991

Nuclear plant warning system fails

Alert prompted, but no radiation escapes facility in New York

ASSOCIATED PRESS

OSWEGO, N.Y. — A warning system in the control room of a nuclear power plant failed yesterday when it lost power, prompting the second-highest emergency declaration under federal guidelines.

However, the site area emergency declared at the Nine Mile Point 2 power plant required no evacuations of plant workers or local residents, said Robert Butrich, a spokesman for the plant's operator, the Niagara Mohawk Power Corp. And no sirens were sounded.

No radiation escaped from the plant on the shore of Lake Ontario, the utility said. The plant was shut down and operations were quickly stabilized after the 6 a.m. incident, utility and government officials said.

Butrich said a preliminary investi-

gation linked the failure to a malfunction in one of the plant's 25,000-volt transformers, each of which is the size of a two-car garage.

Inspectors from the federal Nuclear Regulatory Commission will try to determine why backup power systems failed at the 3-year-old, 1,080-megawatt plant, said Karl Abraham, an NRC spokesman.

The power loss initially affected only warning devices called annunciators. Then, other control room instruments went out for about 20 minutes when the backup power sources did not kick in, Butrich said.

Peter Slocum, a spokesman for New York's state Disaster Preparedness Commission, which activated its emergency center in Albany to monitor the situation, said such a failure could have had significant repercussions.

Slocum said state officials were notified at about 6:20 a.m. that enough power had been restored that technicians could tell the reac-

tor was being shut down safely.

"We all breathed easier at that point," Slocum said.

The NRC has four levels of emergency. A general emergency is the most serious, followed by a site area emergency. The next lowest level is an alert, and an "unusual event" is the least serious level of problem.

Just two other incidents in the roughly 30-year history of commercial nuclear power have been declared as site area emergencies, one in March 1990 at the Vogtle plant in Georgia, and one in January 1982 at the Ginna plant in upstate New York, according to John Kopek of the NRC.

Following declaration of the site area emergency, the utility, the state and Oswego County opened emergency centers. Both the county and state reduced staffing at their centers later in the day.

In response to the emergency, the New York Power Authority declared an alert at its adjacent James

A. FitzPatrick nuclear power plant and offered technical assistance to Niagara Mohawk.

The NRC sent a team of seven specialists to review the problem and Niagara Mohawk's response, said Abraham.

It was too early to tell how long the plant might be out of operation, Butrich said.

In June, the NRC removed both Nine Mile 2 and its older Unit 1 sister reactor from its watch list of the nation's most poorly run nuclear power plants, praising Niagara Mohawk for improving operations since the plants were put on the list in 1988.

But Kenneth Bossong, director of the Critical Mass Energy Project of the activist group Public Citizen, said that doesn't mean the plant is well-run, saying the watch list "has become totally politicized and no longer reflects the true safety of a given plant." He said the plant should be closed, calling it "an accident waiting to happen."

Lightning Causes Fire at A-Plant in Massachusetts

By MATTHEW L. WALD

A nuclear plant in western Massachusetts declared an emergency early yesterday after a lightning strike set fire to one of its transformers, knocked out both power lines that bring in electricity for safety systems and shut down its telephone switchboard.

No one was injured, and there was no release of radiation.

The plant, Yankee Rowe, 35 miles east of Albany and a mile south of the Vermont border, was operating at full power when an electrical storm struck the area in the Berkshire Mountains. But workers began a shutdown process without difficulty, and the reactor was expected to reach a complete shutdown about 8 A.M. today.

Lightning struck one of Yankee's three transformers at 11:50 P.M. on Saturday. "We get hit with lightning several times every year and usually we can ride them out," said William J. McGee, a plant spokesman. "But this was a humdinger."

Operators on duty declared an unusual event, the least severe category of emergency, at 12:17 A.M. yesterday, but the shift supervisor declared an alert, the next-highest category, at 1:30, after evaluating the damage. After consulting with Massachusetts and Vermont officials, the operators



A nuclear plant in Rowe, Mass., was struck by lightning.

downgraded the plant's condition to that of an unusual event at 4:50 A.M.

Emergency Generators Used

The Nuclear Regulatory Commission requires that an alert be declared when "events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant."

The plant's status will continue to be classified as being that of an unusual event until the reactor reaches "cold shutdown," when the water in the cooling system is below the boiling point at atmospheric pressure, Mr. McGee said.

With no power available from the outside, emergency diesel generators were started to provide electricity for pumps and valves. The plant has two backup telephones that continued to work, one of which was taken over by resident inspector for the Nuclear Regulatory Commission, Mr. McGee, said. The fire was put out by the plant's fire brigade, he said.

Yesterday plant workers were checking equipment for hidden damage from power surges and seeing what repairs and parts were needed to resume operations, Mr. McGee said.

Yankee Rowe, which began operations in July, 1961, is the oldest operating commercial reactor in the United States. Its owners, a group of New England utilities led by Northeast Utilities of Berlin, Conn., are planning to apply for a renewal of its operating license, which will expire in 2000. But groups concerned about nuclear safety assert that the metal of the reactor vessel has become too brittle for continued safe operation.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9123496

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: BATES, Frank S.: UNIVERSITY OF MINNESOTA

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/14/91

SUBJECT: A COPY OF A LETTER SENT TO JAMES WATKINS REGARDING
THE ADVANCED NEUTRON SOURCE PROJECT.

DIRECTORATE
ASSIGNED:

STAFF
ASSIGNED:

ACTION
REQUIRED:

STAFF
ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE:
DATE COMPLETED:

STAFF DUE DATE
DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #:

CONTACT PERSON:
PHONE:

EXT:

REMARKS:

OSTP RECEIVED: 08/15/91
DEPT RECEIVED:

FILE: ^P B-PHYSICAL SCIENCES-ENERGY

UNIVERSITY OF MINNESOTA

*Twin Cities Campus**Department of Chemical Engineering and
Materials Science
Institute of Technology**151 Amundson Hall
421 Washington Avenue S.E.
Minneapolis, MN 55455-0132
U.S.A.**Tel: 612-625-1313
Fax: 612-626-7246*

TELEFAX COMMUNICATION

UNIVERSITY OF MINNESOTA FAX (612-626-1686)

TO: Dr. D. Alan Bromley
Advisor to the President and
Director of the Office of Science and Technology Policy
Washington, D.C.

FAX #: 202-395-3261

FROM: Professor Frank S. Bates
Department of Chemical Engineering and Materials Science

DATE: August 14, 1991

Number of pages including cover page: 5

Message:

Please see attached.

3496

UNIVERSITY OF MINNESOTA

Twin Cities Campus

Department of Chemical Engineering and
Materials Science
Institute of Technology

151 Amundson Hall
421 Washington Avenue S.E.
Minneapolis, MN 55455-0132
U.S.A.

Tel: 612-625-1313
Fax: 612-626-7246

August 14, 1991

Dr. D. Alan Bromley
Advisor to the President and
Director of the Office of Science and
Technology Policy
1600 Pennsylvania Avenue
Washington, D.C. 20500

Dear Dr. Bromley:

Enclosed is a copy of a letter I have sent to the Honorable James D. Watkins regarding the Advanced Neutron Source (ANS) project. As chairman of the National Steering Committee for the ANS (NSCANS) I represent a diverse group of scientists and engineers who depend on a reliable source of neutrons for conducting research and development over a broad range of disciplines.

Impressive progress has been made in the design of a state-of-the art reactor to be located at Oak Ridge National Laboratory. During our most recent NSCANS meeting in June of this year the ANS design team documented neutron fluxes that will be 5 to 10 times greater than are currently available at any reactor in the world. This multipurpose facility will provide our nation with a crucial resource well into the next century.

Please contact me, or any other member of NSCANS if we can be of assistance to you in assessing the progress of the Advanced Neutron Source project.

Sincerely,



Frank S. Bates
Professor and
Chairman, NSCANS

FSB/bh

Enclosure

UNIVERSITY OF MINNESOTA

Twin Cities Campus

*Department of Chemical Engineering and
Materials Science
Institute of Technology*

*151 Amundson Hall
421 Washington Avenue S.E.
Minneapolis, MN 55455-0132
U.S.A.*

*Tel: 612-625-1313
Fax: 612-626-7246*

August 13, 1991

The Honorable James D. Watkins
Secretary of Energy
U.S. Department of Energy
Forrestal Building, Room 7A-257
1000 Independence Avenue SW
Washington, D.C. 20585

Dear Secretary Watkins:

I write you as chairman of the National Steering Committee for the Advanced Neutron Source (NSCANS) and as a University Professor charged with the responsibility for educating the next several generations of scientists and engineers in this country.

The future viability of numerous technical endeavors in the United States is critically dependent on the timely completion of the Advanced Neutron Source (ANS) project. Virtually all the scientific and engineering disciplines depend on a reliable source of neutrons in some way. The medical community requires a steady supply of radioactive isotopes. Material scientists and physics exploit the unique penetrating and magnetic properties of these sub-atomic particles to elucidate the structure of condensed matter, while biologists and chemists can unravel the configurations of complex molecular structures with a specificity unavailable with any other technique. NSCANS reflects this diversity in order to insure that the ANS will serve this broad community in an efficient manner. To date, the ANS design group has made frequent use of our committee in developing this multifaceted facility. I have attached a list of our committee members, along with telephone numbers and invite you to contact us in the event that we may be of assistance in assessing the ANS program.

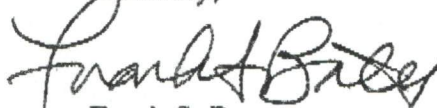
My own professional career has involved me in neutron scattering since graduate school in Chemical Engineering at the Massachusetts Institute of Technology. Following graduation I spent seven years at A.T.&T Bell Laboratories investigating the structure and properties of polymeric materials. Neutron scattering plays a decisive role in this field, since deuterons can be replaced by protons leading to "molecular staining" in bulk materials. Without any reservation I can state that neutron scattering represents the most significant instrumental development in the polymer area for over two decades. As a faculty member at the University of Minnesota I am currently training seven Ph.D. students in these techniques. Current industrial applications are in a variety of products including adhesives, lubricants, composites and high impact plastics. It is imperative that we provide this new generation of scientists and engineers with the tools necessary for us to enter the 21st century.

The growth in neutron related techniques, and the associated applications in basic science and engineering continues to far out-pace the supply of neutrons. Completion of the ANS will provide the United States with the means for satisfying this growing need

The Honorable James D. Watkins
August 14, 1991
Page 2

well into the next century. I respectfully encourage you to give the ANS project the highest possible priority. There is no substitute for this facility.

Sincerely,



Frank S. Bates
Professor and
Chairman, NSCANS

FSB/bh

c Dr. William Happer
bc Dr. D. Alan Bromley

NATIONAL STEERING COMMITTEE FOR THE ADVANCED NEUTRON SOURCE (NSCANS)

CONDENSED MATTER PHYSICS (6)

G. AEPPLI
*R. J. BIRGENEAU
C. S. CARGILL
L. M. FALICOV
S. M. SHAPIRO
S. K. SINHA
- AT&T BELL LABS. (201-582-4532)
- M.I.T. (617-253-4801)
- IBM (914)-945-1958)
- U. OF CAL. (B) (415-642-5993)
- BNL (FTS 666-3822)
- EXXON (908-730-2875)

CHEMISTRY (4)

B. M. CRAVEN
R. L. HARLOW
*J. B. HAYTER
*J. J. RUSH
- PITTSBURGH U. (412-624-9317)
- DUPONT (302-695-2097)
- ORNL (FTS 626-9300)
- NIST (PAST CHAIRMAN) (FTS 879-6231)

BIOLOGY (2)

*D. M. ENGELMAN
A. WLODAWER
- YALE U. (203-432-5600)
- NCI (301-698-5031)

MATERIALS SCIENCE (3)

*A. N. GOLAND
R. PYNN
J. R. WEERTMAN
- BNL (FTS 666-3819)
- LANL (FTS 843-8842)
- NORTHWESTERN U. (708-491-3537)

POLYMERS (2)

T. P. RUSSELL
*R. S. STEIN
- IBM (SAN JOSE) (408-927-1638)
- U. OF MASS. (413-545-0433)

COMMERCIAL PREFIXES FOR FTS NUMBERS:

ANL 972 ⇒ (708)-972
BNL 666 ⇒ (516)-282
NIST 879 ⇒ (301)-975
LANL 843 ⇒ (505)-667
ORNL 624 ⇒ (615)-574

FUNDAMENTAL PHYSICS (3)

*G. L. GREENE
A. STEYERL
R. WILSON
- NIST (FTS 879-4842)
- U. OF R.I. (401-792-2204)
- HARVARD U. (617-495-3387)

NUCLEAR AND CHEMICAL ANALYSIS (2)

*R. F. FLEMING
R. LINDSTROM
- U. OF MICH. (313-764-6215)
- NIST (FTS 879-6281)

ISOTOPES (2)

J. E. BIGELOW
*R. M. BRUGGER
- ORNL (FTS 624-6926)
- U. OF MO. (314-882-7027)

MATERIALS IRRADIATION (2)

L. K. MANSUR
*G. R. ODETTE
- ORNL (FTS 624-4797)
- U. OF CAL. (SB) (805-893-3141)

NEUTRON SOURCES (3)

*J. M. CARPENTER
D. CROUCHER
W. L. WHITTEMORE
- ANL (FTS 972-5519)
- EG&G (ROCKY FLATS) (303-966-2176)
- GENERAL ATOMCS (619-455-3276)

MEMBERS AT LARGE (3)

J. D. AXE
*F. S. BATES
*R. M. MOON
- BNL (FTS 666-3821)
- U. OF MINN. (CHAIRMAN) (612-624-0839)
- ORNL (SECRETARY) (FTS 624-5234)

DOE LABS NIST AND NCI UNIVERSITIES INDUSTRIES

9 4 12 7

"CORRESPONDENCE TRACKING"

TYPE: PRESIDENTIAL

DOCUMENT NUMBER: 9123494

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: PEOPLES, John: FERMILAB

TO: PRESIDENT BUSH

DATE OF
CORRESPONDENCE: 08/09/91

SUBJECT: RE: A NEW INFORMAL PROFILE OF FERMILAB.

DIRECTORATE
ASSIGNED:

STAFF
ASSIGNED:

ACTION
REQUIRED:

STAFF
ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE:
DATE COMPLETED:

STAFF DUE DATE
DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #:

CONTACT PERSON:
PHONE:

EXT:

REMARKS: Enclosures to DAB.

OSTP RECEIVED: 08/15/91
DEPT RECEIVED:

FILE: P-EOP-PRESIDENTIAL*P-PS-ENERGY



Fermilab

3494
Fermi National Accelerator Laboratory
P.O. Box 500 • Batavia, Illinois • 60510
708-840-3211 FTS 370-3211

Director's Office

August 9, 1991

OSTP
George Bush
President
The White House
Washington, D.C. 20500

Dear Mr. President:

I am happy to present you with a new, informal profile of Fermilab, the largest, most active high-energy physics laboratory in the United States. *Boundless Horizons* conveys the essence of what we do, the spirit of our approach, and the values that over the years have shaped the Laboratory's contributions to science and to society.

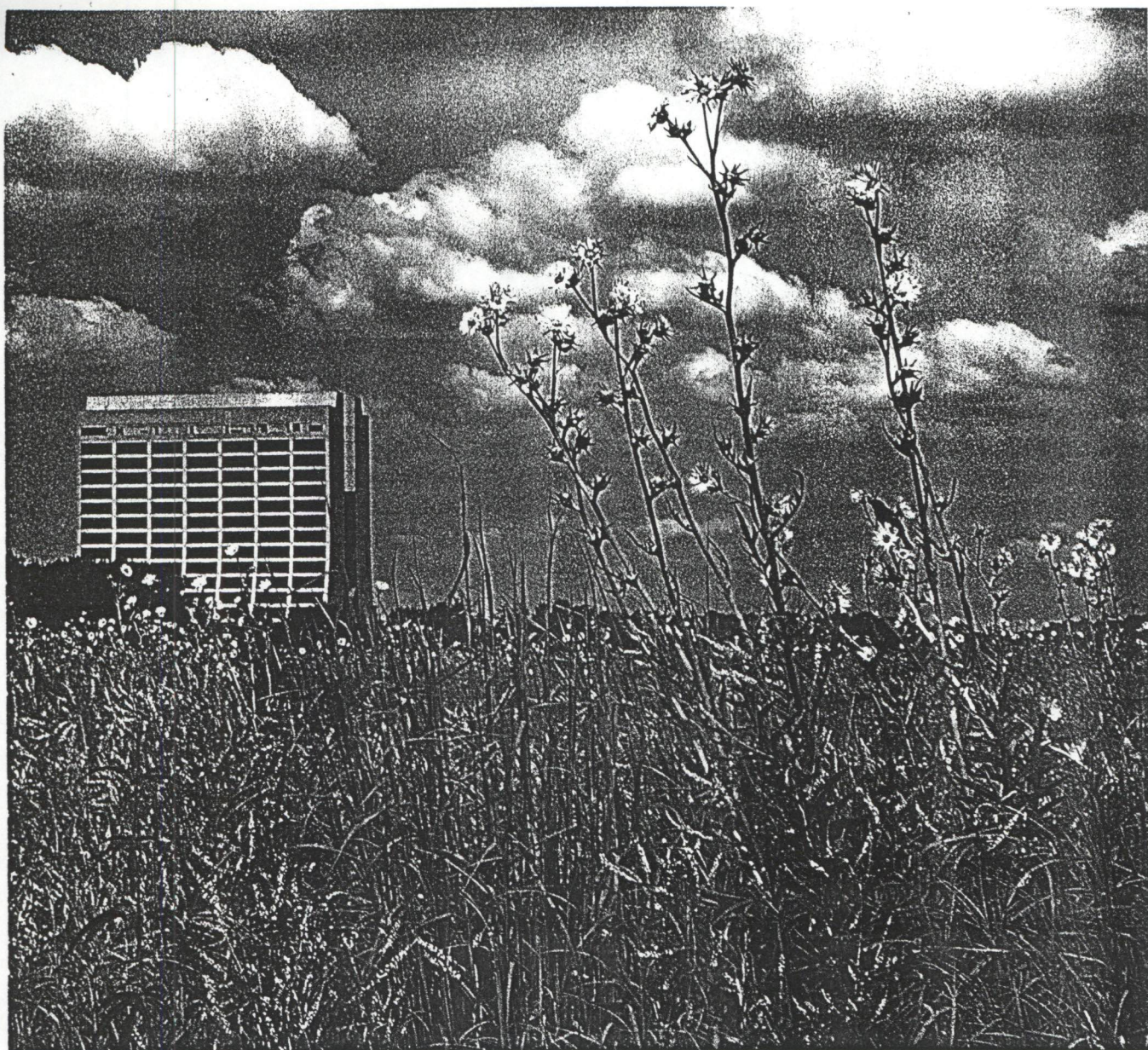
Civic leaders of wisdom and foresight have helped Fermilab to become a national laboratory of the highest quality. We are grateful for your commitment to scientific excellence, to technical innovation, and to learning of many kinds.

I hope you share my pride in the vigor, excitement, and importance of our achievements and our aspirations.

Sincerely yours,

John Peoples
Director

Enclosure
Boundless Horizons



FERMILAB: BOUNDLESS HORIZONS

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9123552
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: FAILE, Dr. Samuel H.

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/06/91

SUBJECT: RE: NEW AND POTENTIAL ENERGY SOURCES.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: PHYSICAL SCIENCES

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 08/21/91 FILE: P-PHYSICAL SCIENCES-ENERGY
DEPT RECEIVED:

Health/science

Cold fusion issue turns tempers hot

THE ASSOCIATED PRESS

BOSTON — A former science writer at the Massachusetts Institute of Technology on Friday accused school researchers of fiddling with data and molding media coverage to discredit cold fusion.

Ron Parker, director of MIT's Plasma Fusion Center, dismissed the charges as "ludicrous."

Dr. Eugene Mallove has written *Fire From Ice*, a book that says the phantom phenomenon of cold fusion can work. He resigned from MIT June 7, alleging that irked officials at the center decided to minimize cold fusion research.

"It's equivalent to someone not putting the plug for an appliance in," Mallove said.

University of Utah chemist B. Stanley Pons and British colleague Martin Fleischmann announced in 1989 that they had achieved cold fusion in a jar.

But many critics remain unconvinced, including MIT researchers who conducted several months of tests on cold fusion in 1989.

Possible Formation of Tiny Black Holes
 And White Holes Reported Earlier. Future
 Topics: Interference of Energetic Waves
 and Observation of String-Like Traces

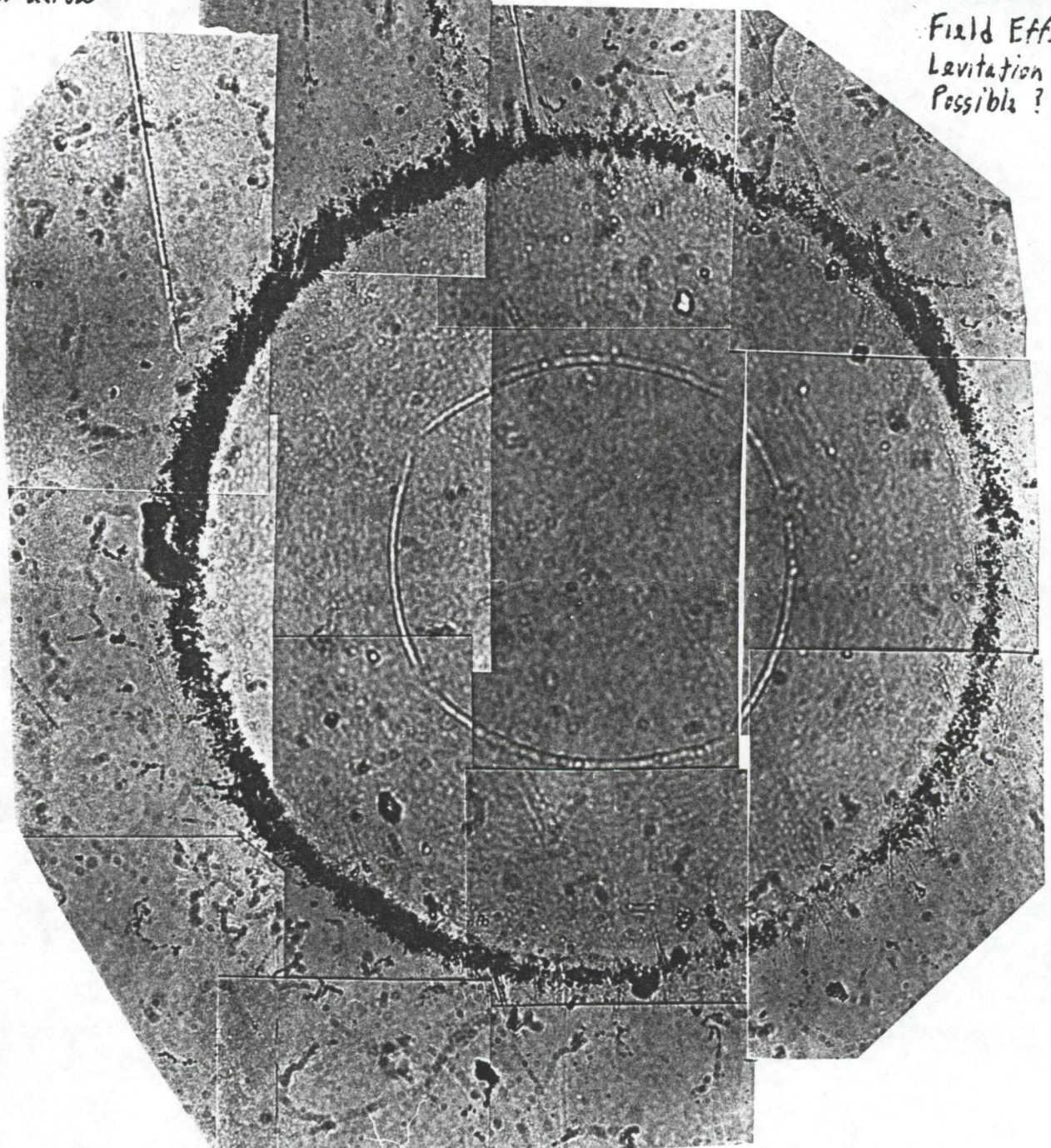
Itens?



Outer Ring
 364 μ m across

Track on Nuclear Emulsion; From Dr.
 T. Matsumoto's Work, "Observation of
 Quad-Neutrons And Gravity Decay
 During Cold Fusion", Fusion Technology,
 July 1991. Inner ring: soup of
 string-like sub-quark materials
 generated after collapsed ^4n explodes?
 Outer dark ring: shock wave of
 micro-explosion reaches the surface of
 the emulsion? Process could yield 100
 times more energy than nuclear fusion.

Field Effect
 Levitation
 Possible?



decay of Helium-8; 4) the production and decay of the nuclei from 11 alpha to 18 alpha; 5) "cold fusion" of Iron-56; 6) cold fission; 7) carbon isomeric configurations (allotropic forms); 8) cold fusion in metal lattices; 9) biological cold fusions and cold fissions (weak energy transmutations); and 10) the distribution of the scattered radiation.

C. NEWS FROM THE U.S.

NEW ENERGY SOURCE PATENTED

Courtesy of Dr. Samuel P. Faile

United States Patent Number: 5,018,180

Title: Energy Conversion Using High Charge Density.

Inventor: Kenneth R. Shoulders, Austin, Texas.

INVENTION ABSTRACT

Disclosed are apparatus and method for obtaining energy from high electrical charge density entities. The energy may be received by the conductor of a traveling wave device positioned along the path which the propagating entities follow. Multiple traveling wave devices may be combined. Energy output from a traveling wave device may also be directed to the generation of a subsequent such entity. Thermal energy may also be obtained from an EV.

EDITORS' COMMENTS

On page 68 and 69 of the patent "Energy Converters" are discussed as an embodiment of the invention. The following comment is made: "With the input pulse length reduced to 5 ns, for example, the corrected energy conversion factor becomes $(16/5)/30 = 96$ [sic, it should be $\times 30$]. That is to say, with the input pulse length reduced as noted, energy available at the output of the helix of the traveling wave tube is ninety-six times the energy input to the traveling wave tube, in addition to the energy consumed within the traveling wave tube and the energy available in the form of collected particles at the collector electrode. ... The EV is a mechanism for tapping a source of energy and providing that energy for conversion to usable electrical form. ... In any event, energy is provided to the traveling wave output conductor, and the ultimate source of this energy appears to be the zero-point radiation of the vacuum continuum."

It is important to note that Ken Shoulders is working closely with H. E. Puthoff (Institute for Advanced Studies at Austin). As an example of Puthoff's work see "Gravity as a zero-point-fluctuation force", *Physical Review A*, Vol 39, No 5, pp 2333-2342, March 1, 1989. Shoulders and Puthoff have been working on the creation and use of

"electron beads" [S.P. Faile, "Zero-Point Energy and Possible Applications to Cold Fusion", *Fusion Facts*, Vol 2, No. 8, pp 17-18, February 1991.] The electron beads consist of 10^9 to 10^{11} electrons similar to a miniature ball lightning. The patent discloses how to create and control such electron beads. As with cold fusion, these electrons beads seem to defy the Coulomb barrier. If 10^9 electrons can be kept in a micron-sized entity, it would appear that two deuterons may be able to get together to fuse.

It is my opinion that this is the most important patent to issue within the last decade (because no cold fusion patents have yet issued). It is my scientific judgement that the mechanism (as yet not fully understood) by which electron beads can be produced will be useful in the understanding and development of cold fusion. We will have more information about this development in the next issue of *Fusion Facts*.

I believe it was Freud that made much of "synchronicity". It is interesting that Shoulders & Puthoff, Fleischmann & Pons, and Randall L. Mills should all discover excess energy devices within such a short time period. Are there some others out there? Hal Fox, Ed.

D. NEWS FROM ABROAD

ITALY - SUPERFLUIDITY OF ^4He

Emilio Del Giudice (INFN, Milano), Matteo Giuffrida, Renata Mele, & Giuliano Preparata (Dept. Fisica, U. di Milano), "Superfluidity of ^4He ", *Physical Review B*, Vol 43, No 7, (1 Mar 1991), pp 5381-88, 20 refs.

AUTHORS' ABSTRACT

We apply the recently proposed approach of quantum field theory of superradiance to liquid ^4He . We find natural, and input-free, explanations of (i) the temperature dependence of the roton gap $\Delta(T)$ and the normal-fluid fraction p_N/p , (ii) the microscopic two-fluid structure of superfluid ^4He ; and (iii) the basic mechanism of vortex formation and the associated critical velocities.

EDITOR'S COMMENTS

In the introduction, the author's state, "Quantum field theory (QFT) is the natural theoretical framework for dealing with quantum-mechanical systems comprising a very large (infinite in the limit) number of dynamical degrees of freedom, such as those occurring in condensed matter." The potential value of the QFT approach in creating a better understanding of cold fusion phenomena is the reason that we have included this non-cold fusion article.

Cold Fusion Products

SAMUEL PURDY FAILE

PRESIDENT

4002 Sharon Park Lane, Apt. 13
Cincinnati, Ohio 45241

(513) 563-4953

Cold Fusion Products

SAMUEL PURDY FAILE

PRESIDENT

4002 Sharon Park Lane, Apt. 13
Cincinnati, Ohio 45241

(513) 563-4953

Cold Fusion Products

SAMUEL PURDY FAILE

PRESIDENT

4002 Sharon Park Lane, Apt. 13
Cincinnati, Ohio 45241

(513) 563-4953

Cold Fusion Products

SAMUEL PURDY FAILE

PRESIDENT

4002 Sharon Park Lane, Apt. 13
Cincinnati, Ohio 45241

(513) 563-4953

Cold Fusion Products

SAMUEL PURDY FAILE

PRESIDENT

4002 Sharon Park Lane, Apt. 13
Cincinnati, Ohio 45241

(513) 563-4953

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION
ORIGINATOR: 02

DOCUMENT NUMBER: 9123128
DIRECTORATE STATUS

STATUS C

FROM: AGNEW, Harold M.

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/29/91

SUBJECT: A COPY OF THE ARTICLE, "LEASING: A SOLUTION TO
NUCLEAR PROLIFERATION" AND IT'S IMPACT.

DIRECTORATE
ASSIGNED:

STAFF
ASSIGNED:

ACTION
REQUIRED:

STAFF
ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE:
DATE COMPLETED:

STAFF DUE DATE
DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #:

CONTACT PERSON:
PHONE:

EXT:

REMARKS:

CLOSED

OSTP RECEIVED: 08/01/91
DEPT RECEIVED:

FILE: P-DAB-PERSONAL*P-PS-ENERGY

HAROLD M. AGNEW

322 PUNTA BAJA DRIVE
SOLANA BEACH, CA 92075

(619) 481-8908

July 29, 1991

3128
RECEIVED

Aug
91 JUL 1 AIO: 14

OFFICE OF THE
DIRECTOR

Dr. Allan Bromley
Science Advisor
Office of Science & Technology Policy
Executive Office of the President
Washington, D. C. 20500

Dear Allan,

I attended a World Resource Institute conference on a "Sustainable World". Runby Gus Speth and a group of anti's. Especially anti-nukes. However, the enclosed article written about 10 years ago caught their attention. May even have turned some of them around. Also gave them a lecture on inherently safe reactors. They read my little newspaper comment.

Hope to see you soon. Have written Selin a note and enclosed the article too.

Sincerely,



Enc.

HAROLD M. AGNEW

Leasing: a solution to nuclear proliferation

Attention to the growing problem of nuclear proliferation was first directed at India's peaceful explosive. More recently it was Israel's destruction of Iraq's research facility that rekindled concern.

What is continually ignored is the fact that since the end of World War II the United States in particular has been exporting what was, and is, the key to success in the nuclear field, namely, knowledge. We have been training mathematicians, chemists, physicists, and engineers in the disciplines required to develop nuclear energy for electrical power or for peaceful explosives. I suspect that half of the key scientists involved in India's and Iraq's programs received some part of their professional training in the United States.

It is too late to stop this transfer of knowledge because a generation has been taught, and all the needed information has been published and distributed. Moreover, trying to pretend that nuclear science and technology are the proprietary preserve of any nation is foolhardy and ultimately self-defeating. We didn't assist the Russians or Chinese in nuclear technology. They became nuclear powers because Russian and Chinese scientists and engineers are the equal of ours.

There is also no question in my mind that many countries, over the next 50 years and beyond, will have no alternative but to exploit nuclear energy if their people are ever to realize a fraction of their expectations. The United States has been inefficient in its use of energy, and with available technology can and will make do with

less. But the greater part of the rest of the world cannot get along with less energy, but must have more. And that energy must be available at a reasonably low cost. So it's not just that nuclear "secrets" can't be kept from smart people everywhere; it's also that there is an absolute need in most of the world for nuclear energy, and this need will grow.

The dilemma, of course, is that if developing nations are supplied with the means to produce nuclear energy, how can those nations which provide the technology and the hardware hope to inhibit the proliferation of nuclear explosives, while still providing the means of raising the standard of living of these poorer nations through nuclear energy?

The United States and other nuclear suppliers have been following a procedure that is replete with loopholes. The Non-Proliferation Treaty, to me, is a license to steal. If a nation signs, the nuclear suppliers are obliged to provide all requested assistance in the nuclear field, but a signator can withdraw from the treaty with no penalty and only 90 days' notice. International Atomic Energy Agency safeguards may detect the covert diversion of plutonium from a reactor, but they cannot stop overt utilization for any purpose. Sanctions are a diplomatic, not a safeguard, problem.

At present, when nuclear suppliers sell a reactor to a nation, they also sell the nuclear fuel and leave it up to the purchaser to solve the problem of disposing of the spent fuel elements which contain plutonium, residual uranium-235, and fission products,

under safeguards but with no specified sanctions.

A reactor without fuel poses no threat. If the supplier nation simply leased fuel on the basis of its energy content—instead of selling it—to the nation purchasing the reactor, and if the fuel then reverted to the supplier after it had served its purpose, there would be no problem about what the receiving nation might do with the residual plutonium.

The question of recycle need never arise, as far as the lessor is concerned, since the client nation has contracted for energy only, not the ownership of the fuel elements. The plutonium, fission products, and so forth would belong to the supplier nation. And that nation, already a nuclear power, would decide what was to be done with the spent fuel. The multitude of fears and questions which have arisen with regard to providing reactors to the Middle East and Korea, for example, need not exist. There would be no need for those nations even to consider having a recycling plant because they would own no fuel to recycle.

The pending agreement for the sale of a reactor to Egypt appears to offer this feature, and the Reagan Administration is to be commended for its initiative. If this is to be our future policy, and if the nuclear powers would simply all agree never to sell the fuel but simply to lease it at a fee based upon the fuel's capacity to deliver a certain amount of thermal en-



Harold M. Agnew, a physicist and former director of the Los Alamos Scientific Laboratory, is president of the General

Atomic Company in San Diego, Calif. 92138. He worked with Enrico Fermi to achieve the first self-sustaining nuclear chain reaction in 1942. He has served in many advisory capacities to the U.S. government.

ergy, a great deal of world concern could be alleviated. It would also make much simpler the concept of international regional nuclear recycling and waste-disposal centers. Leasing is a common practice in the West; the larger computer suppliers and copy machine manufacturers have been doing it for years.

Such a procedure will not prevent major industrial nations from developing a nuclear industry or from developing nuclear explosives, but it will prevent the government of an underdeveloped or small nation, which has a legitimate need for nuclear power, from being tempted to develop nuclear explosives. It would also clear the air with regard to a nation's eventual intentions. If a government refuses to accept a nuclear power contract wherein the fuel is provided only through a lease agreement, and with its final disposition to be determined by the supplier, then it clearly must have more in mind than providing clean, cheap energy to benefit its people. Leasing is the current practice of the Soviet Union with respect to the nations it supplies.

The developing countries will argue that this is discrimination and supplier cartel. They're right. But what are the purposes and effects of the discrimination? OPEC, for example, is a discriminatory cartel to raise prices and keep them as high as the traffic will bear. Mandatory leasing by suppliers, however, confers a financial benefit on recipient states, which will not have to capitalize fuel inventory. This is in return for isolating supply from the uncertainties of nuclear proliferation events such as India's explosion.

Leasing also will guarantee long-term fuel supplies because the supplier nations will have to do something to recoup residual values in spent fuels. They will have to reprocess, when the overall economics so dictate, and this can be done most economically on an

international basis. The suppliers, as fuel bankers, can't afford to sit on wasting assets—that is, plutonium and uranium. Plutonium will be available for recycle, but only when it makes economic sense; and when it does there will be firm controls on "the plutonium economy" because the fuel will be available only on lease terms.

Such a policy finally leads to an international "fuel bank," controlled by suppliers in whom ownership of special nuclear material is vested. The retained property rights should provide a much firmer basis in international law for safeguards inspection and, if necessary, action by force to recover property in the event of misuse.

It probably also makes sense to lease to utilities and other users within the United States. This procedure can help the utilities financially, and they need it right now. But it also provides a much firmer foundation for domestic safeguards. Diversion in this country is really a hostile act against the government, with a presumption of

threat to national security. It should not be regarded as simply an attempt to steal property, where redress under most applicable state laws is limited to the value of the property.

The fundamental reason the "Private Ownership Act" was passed in 1964 was to get the government out of the role of banker. The earliest international agreements for cooperation were on a government-to-government lease, and then only for research purposes. When power reactor agreements began to be negotiated, foreign governments were obliged to retain title to transferred material for power reactors until private ownership was permitted in the United States.

It's time to rethink these steps. We must address the need to establish an international nuclear fuel bank, where title is held by the participating supplier governments and fuel is available only on lease terms to all users. Treaty arrangements could then put real teeth in what steps suppliers could take if clients cheated or misused leased materials. □

"CORRESPONDENCE TRACKING"

TYPE: ACTION DOCUMENT NUMBER: 9122806
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: WILLIAMS, Monique Charissa: Environmental Scientist

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/22/91

SUBJECT: RE: DISAPPOINTMENT WITH THE CONTENT OF THE
PRESIDENT'S NATIONAL ENERGY STRATEGY, SPECIFICALLY
THE DRILLING IN THE ANWR.

DIRECTORATE STAFF
ASSIGNED: PHYSICAL SCIENCES ASSIGNED:

ACTION STAFF
REQUIRED: DIRECT REPLY ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 08/08/91 STAFF DUE DATE
DATE COMPLETED: 7/29/91 DATE COMPLETED/DEPT:

COPIES TO: ENVIRONMENT
D. Allan Bromley

WHITE HOUSE TRACKING #: **CLOSED** CONTACT PERSON:
REMARKS: PHONE: EXT:

7/29/91 Per DAB, "needs no answer."
I gave Environment Directorate
an info copy w/ DAB's note.

Sally Sherman

OSTP RECEIVED: 07/25/91
DEPT RECEIVED:

FILE: P-PHYSICAL SCIENCES-ENERGY

→ may suit
for closeout

"CORRESPONDENCE TRACKING"

TYPE: ACTION
ORIGINATOR: 02 STATUS I DOCUMENT NUMBER: 9122806
DIRECTORATE STATUS

FROM: WILLIAMS, Monique Charissa: Environmental Scientist

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/22/91

SUBJECT: RE: DISAPPOINTMENT WITH THE CONTENT OF THE
PRESIDENT'S NATIONAL ENERGY STRATEGY, SPECIFICALLY
THE DRILLING IN THE ANWR.

DIRECTORATE STAFF
ASSIGNED: PHYSICAL SCIENCES ASSIGNED:

ACTION
REQUIRED: DIRECT REPLY STAFF
ACTION:

*Needs no
answer.*

SENDER'S DUE DATE:
OSTP DUE DATE: 08/08/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: ENVIRONMENT
D. Allan Bromley

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS:

OSTP RECEIVED: 07/25/91 FILE: P-PHYSICAL SCIENCES-ENERGY
DEPT RECEIVED:

regarding the research done by DOE and the Executive Branch on alternative technologies and why those provisions of the President's policy were chosen in lieu of some of the suggestions I have made in this letter or those futuristic technologies already in place in Western Europe.

Thank you,

Monique Chausson-Williams
Environmental Scientist

I realize that Pres. Bush will not see this note. Having worked in the Ariz. Governor's office, I am familiar with the process for responding to constituents. However, I would like for the President's Executive Assistant & Liaison w/ DOE to see this letter.

I am very disappointed in the content of the President's National Energy Strategy. The focus on drilling in the ANWR is disheartening.

Both Houses are working on their own policies and I would urge the President to change his approach and support end-use conservation and efficiency measures, fuel taxes, fuel efficient vehicles, clean-burning fuels, increased renewable energy R&D funds, appliance efficiency measures, etc. Many of these provisions are already found in the more than 80 energy bills now in Congress.

I understand that the President is considering vetoing any energy bill which does not include drilling in the ANWR. I cannot state strongly enough that this idea is illconceived.

President Bush has started off on the right foot, environmentally, with the Clean Air Act Amendment of 1990, but if he continues to remain sympathetic with the automobile and oil industry lobby, he will be making a big slip-up in the eyes of the American Public.

I would like to request a copy of the President's Energy Policy as well as documentation

Bush Library Photocopy

regarding the research done by DOE and the Executive Branch on alternative technologies and why those provisions of the President's policy were chosen in lieu of some of the suggestions I have made in this letter on those futuristic technologies already in place in Western Europe.

Thank you,

Spouge Charles Williams
Environmental Scientist

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9122666

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: BISCONTI, Ann S.: USCEA

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/12/91

SUBJECT: RE: RESULTS OF OPINION POLLS ON NUCLEAR ENERGY.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

CLOSED

OSTP RECEIVED: 07/23/91
DEPT RECEIVED:

FILE: P-PHYSICAL SCIENCES-ENERGY

2666



U.S. Council for Energy Awareness

RECEIVED

91 JUL 23 P 2:45

Suite 400
1776 I Street, N.W.
Washington, DC 20006-2495
(202) 293-0770

Ann S. Bisconti, Ph.D.

Vice President, Research and Program Evaluation

July 12, 1991

OFFICE OF THE
DIRECTOR

The Hon D. Allan Bromley
Assistant to the President for
Science and Technology
Office of the President
Washington, DC 20506

Dear Mr. Bromley:

This year's poll of opinion leaders by Cambridge Reports/Research International shows overwhelming support for preserving nuclear energy as an option for baseload electricity (71% to 11%), accelerating research and development on advanced nuclear energy plant designs (77% to 14%), and accelerating siting and construction of a permanent nuclear waste disposal facility (83% to 7%).

Also, by 75% to 12%, opinion leaders believe that the United States has the scientific and technical expertise to construct a safe and reliable nuclear waste disposal facility. These results and subgroups differences are shown on the enclosed green flier.

I'm also sending along some earlier publications that you may not have seen. The blue flier reports Bruskin poll findings that most Americans who say they live near nuclear energy plants believe the plants are operated safely (59%) or have no opinion (26%); only 12% thought the plants were not operated safely. These data are from March.

In May, Cambridge Reports found that 50% of all U.S. adults gave high ratings to nuclear energy plant safety vs. 26% who gave low ratings. Just 7% knew that the NRC monitors the safety of each plant every day. Knowing this fact alone raised ratings to 62% (high) vs. 20% (low).

As interest in nuclear energy increases nationally, so do the questions I get about public opinion on the subject. Many people ask me why the numbers on one poll seem to disagree with those on another poll. Usually the numbers do not disagree. Two enclosed articles try to help resolve the confusion and put the various opinions people have about nuclear energy into perspective.

I hope this information is useful to you.

Sincerely,

A handwritten signature in blue ink that reads "Ann Bisconti". The signature is fluid and cursive, with the first name "Ann" and last name "Bisconti" clearly distinguishable.

Ann S. Bisconti

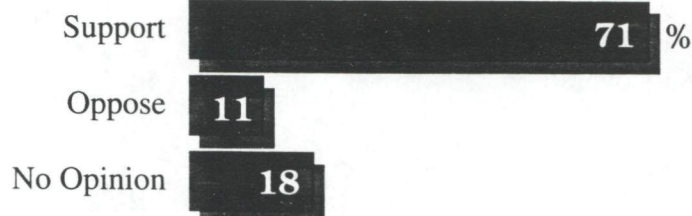
Enclosures

U.S. Opinion Leaders

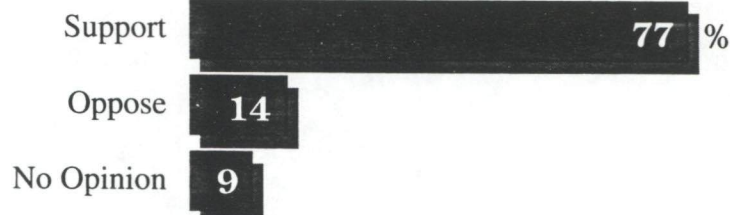
Policy Choices

- I would like your opinion about some policy choices for nuclear energy. For each one, please tell me whether you support the policy, oppose the policy, or have no opinion.

• **Preserve nuclear energy as an option for baseload electricity**



• **Accelerate research and development on advanced nuclear energy plant designs**

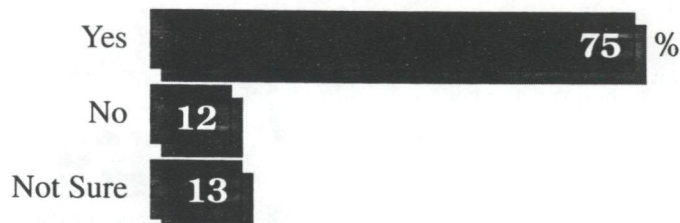


• **Accelerate siting and construction of a permanent nuclear waste disposal facility**



Ability to Construct Waste Facility

- Do you think the United States has the scientific and technical expertise to construct a safe and reliable nuclear waste disposal facility?



Source: Cambridge Reports/Research International surveyed a sample of 500 opinion leaders in February/March 1991. There were 50 randomly selected opinion leaders from each of the following groups: federal legislators, federal officials, state legislators, state officials, business executives, financial executives, public interest groups, national media, local media and academics/policy experts.

Opinion Leader Subgroups

	Preserve nuclear energy as option for baseload electricity	Accelerate R & D on advanced nuclear energy plant designs	Accelerate siting and construction of waste facility	U.S. has technical expertise to construct waste facility
	%	%	%	%
Opinion leaders overall	71	77	83	75
<i>Federal legislators</i>	76	72	80	72
<i>Federal officials</i>	88	92	86	86
<i>State legislators</i>	60	66	82	72
<i>State officials</i>	70	74	88	76
<i>Business executives</i>	88	94	90	88
<i>Financial executives</i>	88	90	92	94
<i>Public interest</i>	46	66	60	52
<i>National media</i>	70	64	80	70
<i>Local media</i>	62	74	86	70
<i>Academics/policy experts</i>	66	78	86	66



U.S. Council for Energy Awareness
1776 I Street, N.W.
Suite 400
Washington, DC 20006-3708
202/293-0770

J.S. Public Opinion

Findings:

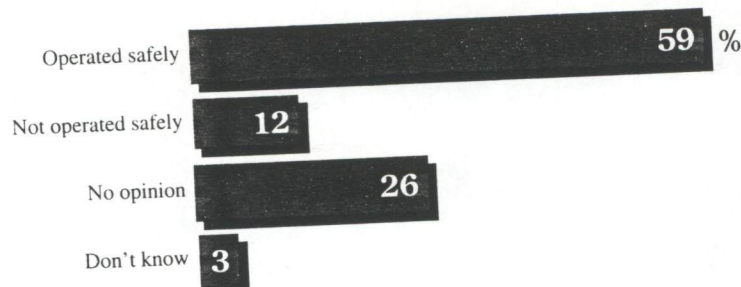
Most Americans who say they *live near* nuclear energy plants believe (the plants are *operated safely* (59%) or have no opinion (26%).

■ Most Americans (total population) expect future nuclear energy plants to be *safer*.

■ A large segment (38%) of Americans say the successful operation of *high technology* in the Gulf War *increased their confidence* in America's ability to operate nuclear energy plants safely.

Questions:

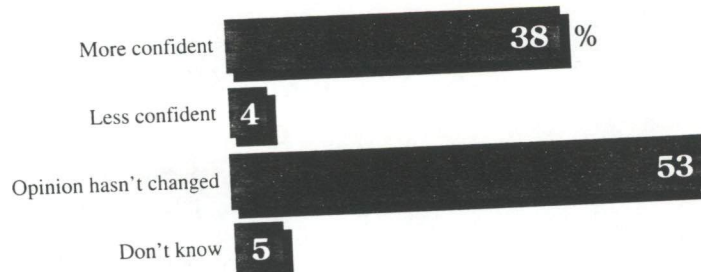
A nationally representative sample of American adults were asked: "To the best of your knowledge, is there a nuclear energy plant that generates electricity in your area?" 27% said 'yes,' 66% said 'no' and 7% said 'don't know.' Those who said 'yes' were asked the following question: "What is your opinion about the safety of these nuclear energy plants that generate electricity in your area? Do you think that they are operated safely, not operated safely, or do you not have an opinion?"



■ "Do you think that nuclear energy plants that might be built in the years ahead will be safer than the plants built in the past?"



■ "After seeing the successful operation of high technology in the Gulf War, do you feel more confident in America's ability to operate our nuclear energy plants safely, do you feel less confident, or hasn't your opinion changed about America's ability to operate its nuclear energy plants safely?"



Source: National poll of 1,007 nationally representative adults by R. H. Bruskin Associates, conducted between March 15-17, 1991. Margin of error is $\pm 3\%$.



U.S. Council for Energy Awareness
1776 I Street, N.W.
Suite 400
Washington, DC 20006-2495
202/293-0770



Public Opinion

Prepared by the U.S. Council for Energy Awareness May 1991

How To Read The Polls: What To Believe When The Numbers Seem To Disagree

By Ann S. Bisconti
Vice President, Research and
Program Evaluation
U.S. COUNCIL FOR ENERGY AWARENESS

Many people find polling data about electricity and nuclear energy confusing or conflicting. A recent article in *National Journal* asserted that "half the public believe no more nuclear energy plants should be built." This finding was based on a December 1989 poll by Cambridge Energy Research Associates. Other polling data, however, show that large majorities of Americans believe nuclear energy will and should play an important role in the years ahead. What is going on here? Was *National Journal* wrong?

The answer is that all these findings are right. The confusion stems from the fact that just one question

in isolation is insufficient to describe public opinion. To get a more complete picture of public opinion, consider what each question is asking, what the answers mean, and how the different answers fit like pieces of a puzzle.

The *National Journal* article failed to point out that, in the same poll by Cambridge Energy Research Associ-

ates, 81 percent said our supplies of electricity are adequate. Because most Americans believe supplies are sufficient, they support the status quo and see no need to build any kind of new power plant—nuclear or otherwise.

In February 1991, a different research firm, Cambridge Reports/Research International, found that

TABLE 1

Americans Hold More Favorable Opinions About Nuclear Energy, But Still Prefer Status Quo

"I'm going to read you three statements about nuclear energy. Please tell me which of these statements most accurately reflects your own attitude toward nuclear energy."

	May 1990 %	February 1991 %
We should use the nuclear energy plants we have now and build more nuclear energy plants.	24	32
We should use the nuclear energy plants we have now, but not build any more plants.	53	48
We should shut down all existing nuclear energy plants, and not build any more plants.	19	15
Don't know.	4	5

Source: All tables and figures present findings from national polls by Cambridge Reports/Research International with nationally representative samples of 1,200 adults. Margin of error is $\pm 3\%$.

only 32 percent of Americans supported building more nuclear energy plants, but few—just 15 percent—wanted to do without the plants we have already (*Table 1*). As of last November, support for building new coal-fired plants was about the same as for nuclear energy plants (*Table 2*). Why is broad support for new nuclear and coal plant construction lacking? One reason is that the foundation for such support—perception of need—has been absent for most of the decade.

Other Cambridge Reports polls found that only 22 percent thought any new electricity capacity would be needed in their area in the next 10 years (*Figure 1*). When given the choice, the public supported energy conservation over energy production by a wide margin (*Figure 2*).

In February 1991, 80 percent believed that nuclear energy will be important in meeting the nation's electricity needs (*Figure 3*), and 76 percent thought that the need for nuclear energy will increase (*Figure 4*). Unless and until the need for new electric supply is obvious, there will be little support for new power plant construction despite the public perception—observed in many different polls—that nuclear energy is the fuel of the future.

Favorability Is Up. Favorable opinion about nuclear energy plants has increased over the past year. Between May 1990 and February 1991, the number in favor of building more nuclear energy plants climbed eight points (from 24 percent to 32 percent). Those who favored shutting down nuclear energy plants dropped four points, from 19 percent to 15 percent—the lowest level recorded in the eight years that Cambridge Reports has asked this question (*Table 1*).

Where Support Is Highest. Persons who say they live near a nuclear energy plant—about half the public—are more favorable. Compared with others, their support for building more nuclear energy plants was 39 percent versus 26 percent; only 12 percent versus 18 percent wanted to shut plants down.

Support for nuclear energy plants is also higher among Americans who say they have taken part in a political activity over the past year: 38 percent would build more plants; only 13 percent would shut plants down. Among those who are not politically active, 30 percent favored building more; 15 percent would shut down existing plants.

Perception and Reality. Opinions about new plant construction may be confused with feelings about

nuclear energy's importance or acceptability. Perhaps that is why excessively negative views of public opinion about nuclear energy persist. For instance, a December 1990 poll by Reichman-Karten-Sword found that only 54 percent of congressional staffers believe the public thinks nuclear energy will play an important role in meeting the nation's electricity needs in the years ahead. In reality, most Americans (80 percent in February) expect nuclear energy to play an important role. A Gallup poll last July also found that the vast majority of Americans (78 percent) expected nuclear energy to play an important role. Also in that poll, 74% of the public agreed we should use more nuclear energy "if that will cut greenhouse gas emissions and air pollution."

TABLE 2

Similar Support For New Nuclear Energy and Coal Plants

"I'm going to read you three statements about nuclear energy. Please tell me which of these statements most accurately reflects your own attitude toward nuclear energy (coal)."

	November 1990	
	Nuclear Energy %	Coal %
We should use the nuclear (coal) plants we have now and build more nuclear energy (coal) plants.	33	31
We should use the nuclear energy (coal) plants we have now, but not build any more plants.	43	51
We should shut down all existing nuclear energy (coal) plants, and not build any more plants.	18	6
Don't know.	6	12

FIGURE 1

Few Think New Electricity Plants Are Needed In Their Area

"Do you think there are currently enough power plants and other generating facilities in your area to meet the demand for electricity for the next 10 years?"

(August 1990)

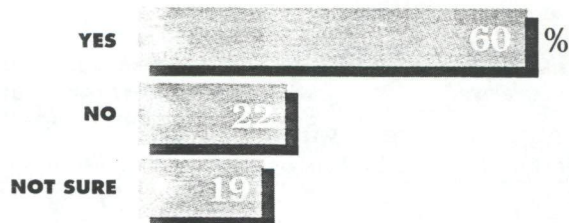


FIGURE 2

Conservation Preferred Over Production

"Do you think the energy problem in this country can best be solved by cutting back on the use of energy, or should the main emphasis be on increasing energy production?"

(September 1990)

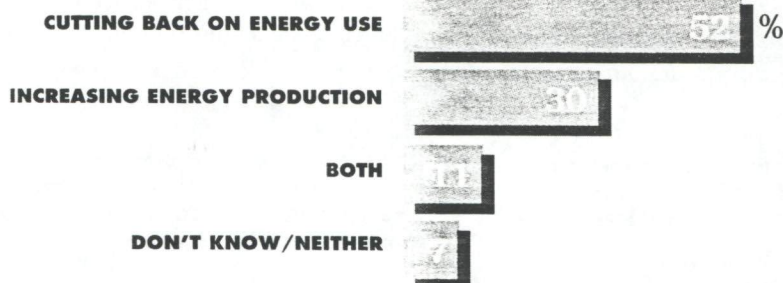


FIGURE 3

High Public Expectations For Nuclear Energy In Providing Electricity

"How important do you think nuclear energy plants will be in meeting this nation's electricity needs in the years ahead?"

(February 1991)

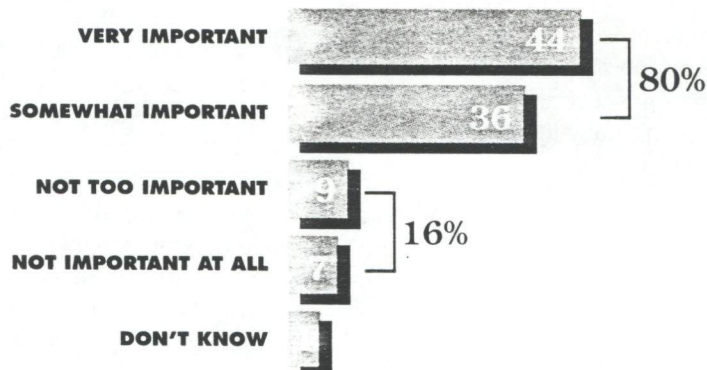


FIGURE 4

Nation's Need For Nuclear Energy Seen Increasing In Future

"Do you think the nation's need for nuclear energy as part of the total energy mix will increase in the years ahead?"

(February 1991)



Broad public acceptance of nuclear energy

- 80% say nuclear energy will be important (*Cambridge Reports*, 2/91).
- 76% say need for nuclear energy will increase (*Cambridge Reports*, 2/91).
- 65% say nuclear energy should be important (*Cambridge Reports*, 2/90).
- 74% say we should use more nuclear energy if that will cut greenhouse gas emissions and air pollution (*Gallup*, 7/90).

(Nuclear energy emits no carbon dioxide, no sulfur oxides, no nitrogen oxides.)

Public perceptions of nuclear energy safety improving (R. H. Bruskin, March 1991)

- Most of those who think they live near a nuclear energy plant believe that the plants are operated safely (59%) or have no opinion (26%); only 12% believe they are not operated safely.
- 38% said they feel more confident about America's ability to operate nuclear energy plants safely after seeing the successful operation of high technology in the Gulf War.

Opinion leaders support nuclear energy (Cambridge Reports, 2/91)

- 71% support preserving the nuclear option; just 11% oppose.
- 77% support accelerated R&D on advanced nuclear energy plants; just 14% oppose.
- 83% support accelerated siting and construction of a permanent nuclear energy waste facility; only 7% oppose.
- 75% believe the U.S. has the scientific and technical expertise to construct a safe and reliable nuclear waste facility; only 12% disagree. (Remainder don't know).

Only a minority of Americans support building more nuclear energy plants. Doesn't that mean most people oppose nuclear energy?

- Americans feel no urgency about the need for any plant construction — only 22% think any new electricity plants will be needed in their area in the next 10 years (*Cambridge Reports*, 6/90).
- So it is not surprising that only about one-third support building more nuclear energy plants — the same as for the other baseload option, coal. Most of the rest support keeping the plants we have — so they obviously accept nuclear energy (*Cambridge Reports*, 11/90).
- Only 15% support shutting down nuclear energy plants as of February 1991 — the lowest number ever (*Cambridge Reports*).
- 40% in April 1991 favored building more nuclear energy plants, the highest figure in years (*Yankelovich Clancy Shulman*).

Congressional staffers support nuclear energy (Reichman, Karten Sword, 12/90)

- 85% think nuclear energy should play an important role.
- 77% favor nuclear energy.

What about NIMBY?

- More people pick nuclear energy (40%) than oil (25%) or coal (22%) as the source the U.S. should rely on most to meet the nation's increased energy needs in the next 10 years.
- On the other hand, more people find coal (51%) than nuclear energy (34%) acceptable in their own area (*Yankelovich Clancy Shulman*, 4/91).
- But most Americans are open-minded: 18% favor a nuclear power plant in their area, 27% oppose, and 54% would reserve judgment until they have more information (*Cambridge Reports*, 8/90).
- New plants will be built where need and acceptability are high and assessment of options leads to nuclear energy as the preferred choice.



The U.S. Council for Energy Awareness (USCEA) is a non-profit organization established to communicate with the public about nuclear energy. Its membership includes electric utilities, architect engineering firms, manufacturing companies, unions, financial institutions, and others. Understanding public attitudes through social science research is a foundation for USCEA communications.

1776 I Street, N.W., Suite 400, Washington, DC 20006-2495, 202/293-0770

THE PUBLIC PERSPECTIVE

A Roper Center Review of Public Opinion and Polling

VOLUME 2, NUMBER 2

JANUARY/FEBRUARY 1991

ENERGY: IS THERE A PROBLEM? NUCLEAR: IS IT THE ANSWER?

By Ann Stouffer Bisconti

For most of the past decade, energy issues have languished in the wings. But this past August, the Gulf crisis again thrust energy to center stage. It had already made a tentative entrance in the waning months of the 1980s, but only as second fiddle to America's growing environmental concerns and then largely at leadership levels. The president's call for a national energy strategy and the need to ensure both energy security and environmental protection had posed the question: What about nuclear power? Since the invasion of Kuwait, that question is being asked with greater frequency. Where does the public stand?

Spencer Weart shows in his book, *Nuclear Fear*, that nuclear energy has long evoked mythic images which transcend and which even preceded it — like great white future cities, on the one hand, and dreadful monsters, on the other. In the face of such persistent imagery, support for increasing the use of nuclear energy has been driven to a great extent by views on how much it is needed. Unfortunately, the public's views of the adequacy of America's energy and electricity supply don't always reflect reality.

Complacency in the 1980s

Nearly a decade ago, when the earlier energy crises went into remission, the strong sense of need for energy development which had characterized the 1970s collapsed. In 1979, almost 7 out of 10 Americans named energy as one of the two most important problems facing the nation. By 1982, though, the proportion had fallen to 5%, and for most of the 1980s it was virtually zero. [The data cited in this article are, unless otherwise noted, from polls conducted by Cambridge Reports either as part of their ongoing polling or specifically for the United States Council for Energy Awareness. Full question texts and response distributions are available from the author.] Three months after the Three Mile Island accident (which occurred in March 1979) the proportion in favor of building more nuclear energy plants was just 4 points below the January 1979 level (46 vs. 50%). But support dropped from the

mid-40% range to around 30% in 1981 and 1982, as energy fell off the public agenda. It stayed around 30% through the 1980s, Cambridge Reports surveys show.

As it happened, public complacency about energy supplies was justified in the early Eighties. In the case of electricity, in particular, supplies were ample. Although electricity use grew 54% between 1973 and 1989 (roughly 3 percent a year), that was less than expected. In the late 1960s and early 1970s, electricity use had increased 7% annually, and electric utilities ordered plants with the expectation they would have to meet that growth rate on a continuing basis. When the rate fell, utilities cancelled orders for 111 nuclear energy plants and 97 fossil fuel plants. Nonetheless, in the 1980s, 48 nuclear energy plants were completed and licensed, bringing the US total to 112.

IN THIS ISSUE

Public Opinion on Nuclear Power in the US, Japan, and France: It's Need Which Drives Things, Not Fear.

Polling and the 1990 Elections: What Went Wrong, and Why.

America's Ambivalent Feelings About Divided Government.

Britain's Ambivalent Feelings About Margaret Thatcher.

A Public Opinion Report Looks at Congress and at the Voting Last November.

Energy Concerns Rise...Somewhat

With US troops poised in the Saudi Arabian desert and energy prices threatening the entire economy, it's harder to ignore energy issues today. Polls by Cambridge Reports in August through October 1990 found small but growing percentages again naming energy as one of the two most important problems — 3% during August 1-5, 8% August 6-9, 9% September 1-9 and again October 1-9. Moreover, in the September survey, fully half of all Americans rated our national energy problems very serious, up 18 points from a year earlier.

By December, however, the number of Americans mentioning energy as one of the two most important problems facing the nation dropped again to 5%. Some of today's most critical national challenges are tied to energy, and Americans seem to sense these ties. But they are not particularly concerned about energy *supplies*. Cost has never been the main driving force behind the public's energy concerns. The driving force has been availability—and today, energy is readily available.

Support for New Energy Development Still Lacking

It's not clear whether, or when, attention to energy issues will bolster support for building nuclear plants. Right now, the public sees no urgent need for energy

development in general. In September, Cambridge Reports asked: "Do you think the energy problem in this country can best be solved by cutting back on the use of energy, or should the main emphasis be on increasing energy production?" Cutting back beat increasing production by a 22-point margin. Another example of the lack of enthusiasm for development: Only 30% in the same Cambridge Reports September poll thought that significant exploration and development would be needed to reduce substantially our dependence on foreign oil; 60% felt that conservation could do the job.

Low Awareness of Supply Problems

Moreover, the focus on energy has not yet extended to electricity. Support for building more nuclear energy plants is unlikely as long as Americans are unaware of any need to increase overall electricity-generating capacity. This past August, Cambridge Reports found that 45% called the *energy* supply problem very serious, but only 17% considered the *electricity* supply problem very serious. And only 22% said they thought any new electricity capacity will be needed in their area in the next 10 years. These perceptions persist despite brownouts and occasional blackouts in many parts of the country, as use has caught up with supply and little baseload generating capacity is being added.

WHAT IS PUBLIC OPINION ON NUCLEAR POWER?

Editor's Note: Countries vary greatly in the extent to which they use nuclear energy to generate electricity. France, for example, generates 70% of its electric power by nuclear plants. This compares to just 20% in the US. Yet, anti-nuclear interest groups have been more active in the US than in France. It follows—doesn't it?—that public opinion in these two countries must be very different: The French less worried about the possibility of nuclear accidents than the Americans, less supportive of the idea that all nuclear plants should be closed, etc.

We don't know for sure, because not enough comparable survey work on the issue has been done in the two countries. Still, a comparison of US findings to those from France's highly respected Brulé Ville Associés polling organization suggests strongly that the French public is at least as inclined to anti-nuclear sentiments as are Americans. BVA asked in its April 1990 poll: "Would you be in favor of completely stopping use of nuclear power plants?" Forty-three percent said yes, only 45% no. It's unlikely any comparable question in the US would derive higher anti-nuclear sentiment. Similarly, the French profess to see a serious nuclear accident in their country as a real possibility: 81% say this, compared to only 12% who say that it isn't possible. Polls in the US don't pick up any higher level of foreboding. Ann Bisconti's piece on opinion on nuclear power in the US, and Keiko Tabusa's on opinion in Japan, also suggest that the dynamic of opinion in these two countries may be quite similar in most regards.

There is one area, however, where France and Japan do differ markedly from the US with regard to nuclear power: *need*. Nuclear energy, physicist Edward Teller observed years ago, is the only great scientific discovery to have been first announced to the world through the explosion of a devastatingly destructive bomb. From the beginning, as a result, public opinion has been uneasy about all applications of nuclear power. At the same time, though, many people see nuclear generation as an unavoidably central element in meeting their electricity needs. The more a public sees a need for nuclear power, the more likely it is to resolve its fundamental ambivalence in favor of using this source for its electricity.

Americans seem to place nuclear energy within the broad energy context: In July 1990, for instance, Gallup found 70% agreeing that using nuclear energy reduces US dependence on foreign oil. Yet the continuing complacency about electricity supply suggests that the connection of electricity with foreign oil may not be clearly understood. More electrification is certainly one of the ways to reduce oil imports, but greater electrification cannot occur without the additional electrical capacity that the public feels we do not need.

High Expectations for Nuclear Energy in the Future

For the future, Americans see a large role for nuclear energy, according to many different polls taken over the past few years. In August 1990, for instance, a Cambridge Reports survey found 70% of Americans believing that nuclear energy already plays an important role in meeting the nation's electricity needs, and 62% expecting that its importance will be greater by the year 2000 than it is today. Coal, which produces 56% of our electricity—and which will be our major source of electricity for at least the next decade—was rated about equal to nuclear energy in its present importance. But only 44% of the public thought that coal's importance will increase. Open-ended questions by Cambridge Reports and others consistently find that Americans name nuclear energy ahead of all other sources as the primary source of electricity 10 years hence. Only about 10% (correctly) name coal.

Another source that is mentioned by the public just behind nuclear energy as the primary source of electricity in the next 10 years is solar. That future-fuel image they both share may be one of the reasons why Americans associate nuclear energy more with solar energy than with the traditional energy sources, oil and coal. In December 1990, when Cambridge Reports asked "which source of energy has the most in common with nuclear energy," 44% said solar, 15% oil, and 15% coal.

Realistic Acceptance

In examining polling data on nuclear energy, it's important to distinguish between preferences and realistic acceptance. Poll after poll indicates an overwhelming public *preference* for solar energy. But Americans view nuclear energy as a realistic choice. For instance, a Gallup poll in July 1990 found 23% calling nuclear energy a good choice, 45% a realistic choice, and 26% calling it a bad choice—"considering all the options available for large-scale use."

Americans have a strong pragmatic streak. This explains why 65%-70% in the past few years have said that nuclear energy should play an important role in meeting the nation's energy needs. It also explains why a

July 1989 TeleNation-Market Facts poll found that 81% believed nuclear energy should play an important role in the US Department of Energy's national energy strategy.

Reserving Judgment

Does this pragmatism carry over from the realm of abstract, hypothetical questions to real-life choices about building new nuclear energy plants? Several polls suggest that most of the public is at least open-minded. In August, Cambridge Reports asked: "If a new power plant were needed to supply electricity for your area, would you favor a nuclear power plant, oppose a nuclear power plant, or reserve judgment until you had more information?" Eighteen percent said they would be in favor of a nuclear power plant, 27% that they would be opposed, while 54% would reserve judgment. The number opposed was down 10 points from a high of 37% in May 1987.

The Greenhouse Question

Environmental concerns, about air pollution particularly, could make nuclear energy a more popular choice. In a July 1990 Gallup poll, three-fourths of Americans (74%) said we should use more nuclear energy if that will reduce greenhouse gas emissions and air pollution. Nuclear energy plants emit no carbon dioxide, no sulfur oxides, and no nitrogen oxides. But only half the public indicated awareness of these facts.

A Local Decision

Although the energy situation and opinions on energy issues both appear in flux, a favorable climate for energy development in general does not yet exist nationally. Americans continue to envision nuclear energy as a mainstay of our future energy supply, but most see no need for more electricity plants of any kind for years to come. There is broad and apparently increasing acceptance of nuclear energy—although not the uninhibited support that solar energy inspires—and significant potential for greater backing as people become aware of nuclear power's specific benefits.

Ultimately, building more electricity plants of one kind or another is not a national decision in the US, as it is in many other countries. Here these decisions are made at the state and local level. New nuclear power plants will most likely be built where the need for more electricity is greatest and where the local utility has earned confidence and trust through its commitment to its community.

A Postscript on Polling on the Nuclear Issue

Many people find the polling data about nuclear energy confusing or conflicting. That leads them to throw

ENERGY POLICY: THE NUCLEAR OPTION/CAMPBELL

up their hands and say, "it's all a matter of how you ask the question." They are missing the point. The differences they observe from one poll to another are generally not caused by researchers manipulating results through question wording. They are differences which reflect real tensions in public opinion.

This confusion accrues from the tendency to assume there is one single opinion on each issue—what Howard Schuman described, in his 1986 presidential address to the American Association for Public Opinion Research, as "the referendum point of view." Public opinion—or opinions—about nuclear energy are far too complex to be captured by a single question. For instance, polls consistently find that large majorities of Americans think nuclear energy will and should play an important role in supplying electricity, but they also consistently find that only about one-third favor building more nuclear energy plants right now.

Legitimate differences in interpretation may add to the confusion. For instance, social scientists who study risk perceptions naturally tend to look to this factor as an explanation for attitudes toward nuclear energy and cite the Three Mile Island and Chernobyl accidents as turning points. Others who have been studying energy attitudes for many years, notably Gene Pokorny of Cambridge Reports, believe that other factors, particularly perception of need, have been far more influential than perception of risk. That belief is backed by the fact that support for building more nuclear energy plants was about the same a year after the Three Mile Island accident as it was the year before. The proportion fell when energy concerns faded. Moreover, most Americans don't favor eliminating the 112 plants that exist today, and they reserve judgment about new nuclear energy plants in their area. The validity of these data are supported by the 16 defeats of initiatives to close operating nuclear energy plants. The single plant which has been closed by voters was a unique case: It was run by a municipal board that was plagued with internal conflict, and the vote reflected frustration with its mismanagement.

THE ROPER CENTER FOR PUBLIC OPINION RESEARCH A Research Library on the Campus of the University of Connecticut

The Roper Center is a non-profit research facility in the field of public opinion and public policy. It maintains the largest and most comprehensive collection of survey data and seeks to promote their informed use. Thousands of scholars, students, policymakers, journalists, public affairs officers, survey research professionals, and others use the Center each year. Founded in 1946 at Williams College, the Center has since 1977 been located at the University of Connecticut.

*Ann Bisconti is vice president for research,
the US Council for Energy Awareness*

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9121818

ORIGINATOR: 02

STATUS I

DIRECTORATE STATUS

FROM: KELLY, D.A.: SPACE ENERGY ASSOCIATION-SEA/US

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 06/15/91

SUBJECT: RE: THE BUSH ADMINISTRATION'S ENERGY PLAN.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: PHYSICAL SCIENCES
INTERNATIONAL/POLICY

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS: Please note that this correspondence is being distributed only
because the enclosures include a letter from Dr. Masayosi Ihara
of Japan.

OSTP RECEIVED: 06/19/91
DEPT RECEIVED:

FILE: ENERGY

P-Physical Sciences-

SPACE ENERGY ASSOCIATION-SEA/US

Alternate Energy Systems

RECEIVED

The Presidential Science Advisor
The White House Office
1600 Pennsylvania Avenue
Washington, D.C., 20500

P.O. Box 11422
Clearwater, FL 34616
(813) 442-3923

91 JUN 19 P 3: 17

OFFICE OF THE
DIRECTOR

June 15, 1991

Dear Sir:

You and your group should be advised that the U.S. is about to lose another major technology to overseas nations, mainly due to the culpable - stupidity of the powers that be in the U.S. today!!

The Bush administrations present energy plan is a total disaster, and if we continue on the path of the reemergence of nuclear energy power plants there will be a lot of us not around to regret this decision.

There is no foresight and true vision in the consideration of various energy alternatives, such as those described in the enclosed SEA, U.S. newsletters and other enclosures.

While we're on the subject of total disasters, another is our academia today, where so-called professors of physics who continue to grind out the same worn-out pap, which to a large extent is no longer valid and of any tangible value in our fast-moving technology in the advanced energy field!

! ~~~~~ These pin-heads continue to cling to the Law of Energy Conservation as if it was engraved in stone, while at the same time the Swiss have three true free energy prototypes which produce useful power in the low KW range. These hybrid electrical machines provide up to 3 to 4 KW, with no input of any sort, after the twin electrostatic discs are started to revolve by hand!!!

The Swiss religious group "Methernitha" is charitable enough to state that our present study of physics is not wrong, but that it just has not gone far enough today! We have now come to understand that the study of physics is largely a matter of perception, and the plain facts are that we have lost our vision and perceptions in this area of energy development.

This nation had better "shape up" very fast, otherwise, surely then we will be "shipping in" - all of this advanced energy technology from overseas as has been done with so much other high-tech equipment in the past.

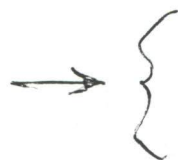
encl: (3)

Yours truly,

D.A. Kelly

REFERENCE!

Rec'd 6/6/91



Dr. Masayoshi Ihara
Free Energy Device Sec.; Cosmic Energy
Asso.(Japan): 37-2, Nisigoshonouti
Kinugasa, Kitaku, Kyoto 603, JAPAN

Kyoto, May 30, 1991

Dear Kelly

Many thanks for your kind letters and informations.

→ This year, at least four free-energy groups have started here, as long as I know. Two of them are backed up by the industrial enterprises. Although these are not so big Co.s.

My freind who is studying on the functions of water in various fields, have gotten the enclosed report on Mr.Norman Haber and wants to know more details of his invention. If you please, let me know the address of Mr. Haber.

I know that there are more than 40 contributors on the subjects of F/E to the IECEC meeting August 4-9 at Boston. I have very much interest for their lectures.

Very Truly Yours

Masayoshi Ihara
Dr, Masayosi IHARA

SPACE ENERGY ASSOCIATION-SEA/US

Alternate Energy Systems

SEA/U.S. End of the Month/ MAY SUMMARY of Events:

Clearwater, FL 34616
(813) 442-3923

Florida Power Corporation
3201 34th Street-South
St. Petersburg, FL, 33711

May 22, 1991

Mr. Allen Keesler, C.E.O.
Florida Power Corp.

Dear Mr. Keesler:

We wish to call to your attention to several promising alternate energy systems which are now in advanced development stages that are being bypassed and ignored by the scientific establishment.

The several enclosures will provide you with an overview of the so-called "free energy" field, which has now become validated and a force to be reckoned with in the years ahead. If it does not become acceptable over here, then it certainly will be accepted by the Pacific rim nations who are now far more receptive to such advanced energy technology than we are over here at this time.

We now have clear evidence that the U.S. is on the decline in these advanced energy technologies by the presentation of a status-quo national energy program as announced by the present Bush administration!

Another indication of this negative direction is the placement of a political schnook as the Presidential Science Advisor. This guy has spent his entire life in academia, so can't possibly know what is really going on in the real world of applied physics!

We have just received information from the GammaStar International group at Seattle, WA., that their "Pod-Mod" modular power system is now operational, and they are now into the life testing of the various components of this remarkable system.

This free energy project has been ten years in the R & D stage, and they are now emerging from this project work with a viable and attractive alternate energy system.

GammaStar is projecting the application of their multiple, "pod-mods" into large container/trailers which would be rated at ten megawatts, at a mean voltage level of 4160, which can be stepped up or down as required for each specific installation. These trailer units would be installed at various utility sub-stations for main or stand-by service as in dependant - power sources.

Each trailer unit would be remotely monitored to insure continuous power service, from a central control station to insure quick service or replacement as the need arises.

The power cost is now projected at 2¢ per kilowatt hour, and the Puget Power Corp. is now considering and reviewing the specs on this "Pod-Mod" modular power system.

Further information on this promising alternate power system can be obtained from.

Mr. Scott McKie (Principal) for GammaStar Int.
4618 3rd Avenue, N.W.
Seattle, WA., 98107

SPACE ENERGY ASSOCIATION-SEA/US

Alternate Energy Systems

P.O. Box 11422
Clearwater, FL 34616
(813) 442-3923

SIERRA CLUB
730 Polk Street
San Francisco, CA., 94109

May 25, 1991

Mr. Michael L. Fischer
Executive Director

Dear Mr. Fischer:

We are enclosing some late information on activities in the free energy field for your review and consideration at this time.

The enclosed letter/ copy to the C.E.O of Florida Power down here is an example of the P.R. activity that we will be taking from now on, to get the message out about about the reality of the, now proven, free energy concept.

We are now very much against the nuclear industry program to target Florida as the site of their so-called "advanced" nuclear power plants that do nothing to solve the basic problems associated with nuclear power plants, as we all now understand this technology.

And now to the crux of this letter: if any one of the following free energy systems projects should prove to be successful after extensive life testing:

- 1) The GammaStar International Corps tank circuit modular system now being evolved at Seattle, WA.
- 2) The Reed Magnetic motor project, and variations of this type of inertial magnetic motor concept.
- 3) The "N" machines now being evolved in the U.S. (1) in Japan (2), and India (2).

we intend to seek the removal from Office of the following U.S. public officials:

- (1) Mr. James Watkins, Secretary of the U.S. Dept. of Energy ?
(This guy is now the Admiral of the energy "Titanic", and he is not even aware of being so!!!!)
- (2) The present U.S. Commissioner of Patents.
- (3) The present Science Advisor??, to the President.

The grounds for this political action will be:

- (1) Culpable scientific ignorance, (not keeping up with, or ignoring, tangible energy advancement being made outside of the so-called, ugh! "scientific mainstream".
- (2) Economic Treason to the U.S. Now that we are in an economic war with the Far Eastern nations, anyone or group that becomes an impediment to the natural advances being made in science/technology must bear the consequences for their ignorance!!
- (3) Contributing to the Delinquency of a Minor, (the minor pinheads who are laughingly called professors of physics in our U.S. colleges and universities today!!!!)

Yours truly,
D.A. Kelly for SEA/U.S.

SPACE ENERGY ASSOCIATION-SEA/US

Alternate Energy Systems

P.O. Box 11422
Clearwater, FL 34616
(813) 442-3923

President George Bush
The White House
1600 Pennsylvania Avenue, N.W.
Washington, D.C., 20500

May 27, 1991

Dear President Bush:

When in the course of human events, a nation goes stark-raving stupid about the adoption of a rational and balanced energy policy, then those of us who know better must take drastic action to offset this ongoing stupidity!!

In order to seek a redress of grievances against the domination of energy means in the U.S. by the major energy monopolies, we will be passing along all that we know about advanced energy systems and methods to the Europeans, and the Pacific rim nations who are in dire need of this alternate energy information.

Since we have been continually brushed off & stonewalled about the reality of the free energy concept, we will now take this information overseas where it is now slowly being accepted and at least being given an objective review and fair shake!!

Unfortunately this action will not be in the best interest of the U.S. at this time when new industry and production is needed, but if you need to place the blame for this situation somewhere, then place it at the doorsteps of the major energy monopolies!

In the long term, this action will be the lesser of two evils, since when the overseas groups begin to adopt this new advanced energy technology they will be able to export it to us, albeit at an exorbitant cost to us!

Since you have done such a great job in laying the groundwork for this upcoming energy scenario, you will have to somehow deal with the digs--that you will be taking from the other political party about your present U.S. energy policy!

It is interesting to note that Dr. S. Inomata, a senior scientist at ETL/Tokyo, is presenting a paper entitled, "The New Paradigm and the N-machine", which indicates their ongoing interest in "N" machine technology. They now have two small projects being evolved in Japan, and in India, with all its social turmoil, they now also have two "N" machine projects being evolved, one in the private sector and the other in the public domain!

As this new emerging energy scenario starts to slowly unfold in the years ahead, we believe that by the year 2000 we will have to take a new look at just what constitutes a First World power, in so far as the acceptance of new energy technologies with mass, socially-redeeming value!!

We hope that you may take some time to rethink through your present energy policy and see that large number of flaws that are in it which are not in the best interest of the U.S. public in the years ahead!

Yours truly,
D.A. Kelly
D.A. Kelly

SPACE ENERGY ASSOCIATION-SEA/US

Alternate Energy Systems

Senator Rufus I. Humberg
U.S. Senate /Office Building
Washington, D.C., 20510-0901

P.O. Box 11422
Clearwater, FL 34616
(813) 442-3923

Dear Senator Humberg:

May 27, 1991

My GOD!, how do we expect to get safely into the 21st Century when all of our vital energy decisions are being made by politicians and lawyers who have only a very limited knowledge of the latest energy source options that are open to us?

In view of the current nuclear energy industry push to sell their so-called "advanced" nuclear power plants, we have to ask if this program is in the best interests of the general public or for their own self-interest.

The nuclear industry might have a plausible case to push if it were not for the fact that a rapidly emerging new energy field is now beginning to offer us some practical and viable decentralized energy options for the years ahead! Most scientists and academics along with the general public are totally unaware of the practicality of "free energy", with no — forum open to the review and consideration of this new energy technology!

The ignorance about this free energy field is appalling, as it is usually linked to "perpetual motion" by those who would discredit it for vested interest purposes! In reality, free energy is closely linked to the conservation of energy in that a small input of electrical or magnetic energy is made to do far more "work" within a circuit or machine, and thus produce a greater output than the energy initially put into the system! The F/E concept is as simple as that, and yet it is being distorted out of all proportion to its reality!

The danger to the U.S. in the future is twofold, and this double edged sword is liable to cut us down both economically and healthwise if we make the wrong decisions with our various alternate energy options.

On the one hand, if we choose to go ahead with the reemerging nuclear power option we will be saddled with a grossly expensive and dangerous power means, and we will not have solved the waste disposal problem.

When we consider socially redeeming occupations by comparative value, we rank nuclear scientists and engineers only slightly above drug pushers, since both are peddling socially dangerous products for public consumption and future sorrow!!!

The other edge of the two edged sword is that if we reject the evolution of the various free energy projects for further development, we will have lost another major manufacturing opportunity here to overseas exploiters, as has been done several times in the past!

It is quite a commentary to realize that India, with all of its current political chaos, has produced two successful "N" machine projects while we have only one small private "N" machine project in California.

The Japanese also have about two "N" machine projects in progress, so that we are now starting to question just what the rules are for attaining First World status in the years ahead!

To Do, or not to do, that is the real question that the U.S. must face up to in the energy field, as we approach the 21st century!

Yours truly
D.A. Kelly
D.A. Kelly



Successful Devices At Hand

Update On 'Free Energy'

By Vicki Cooper &
D.A. Kelly

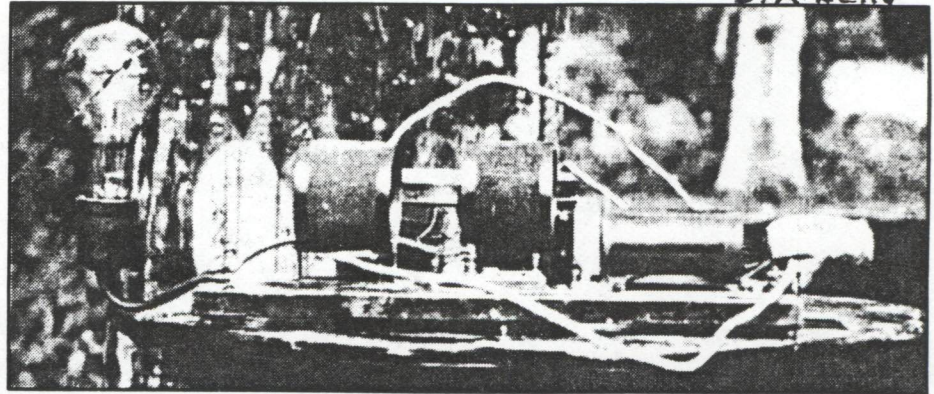
Our present energy situation on the planet is now stretching its ability to rebound from the abuses that are constantly dumped on it by continued deforestation, the wide use of hydrocarbon fuels, nuclear waste products, coal mining and oil spills from tankers and other fuel-handling mishaps (up to and including the "environmental terrorism" perpetrated by Saddam Hussein).

In the past, two fateful changes in the natural course of our energy use, whether by chance or by war, have worked against the continued healthful environmental quality of our planet.

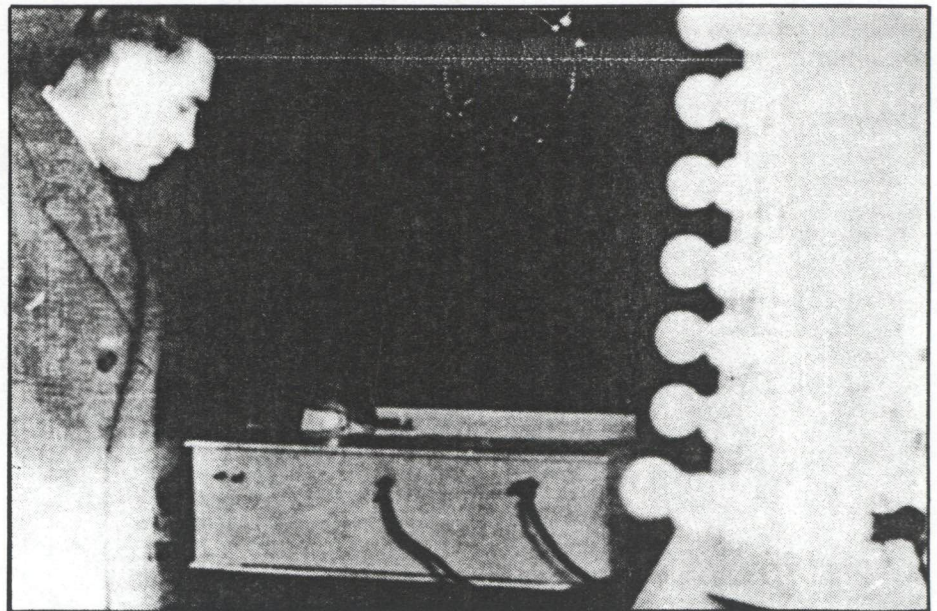
The first significant change occurred in the early 20th century, when both gasoline- and electrically-driven cars were competing for transportation dominance. The first producing oil field in the U.S. was discovered in 1859. By the early-20th century, the U.S. was one of the leading exporters of crude oil. However, the newly-developing electrical engines were quite crude, and couldn't hope to match the performance of the internal combustion engine. The thriving oil industry could only be helped by the gasoline-driven auto. So it was that model which came to dominate individual transportation needs, and does so still.

The second major energy source shift began during the early stages of World War II, when the Manhattan Project worked on the rapid development of the atomic bomb, rushing it to completion before the Axis powers could get there first. Under the pressure of necessity for Allied survival, no other course could be followed at the time. But subsequent events have shown us the profound negative impact of nuclear energy plants on our worldwide environment. Not only are we bedeviled with the constant threat of nuclear accidents, we continue to be inundated with nuclear waste products that we haven't yet learned to handle safely. Most of our nuclear power plants continue to have very high maintenance and repair costs, along with these high-level safety problems.

Both the oil and nuclear options



MORAY DEAL—Two views of T. Henry Moray's radiant energy device. Above, an earlier version with superficial coils the inventor used to protect his discovery. Below, Dr. Moray with a later device.



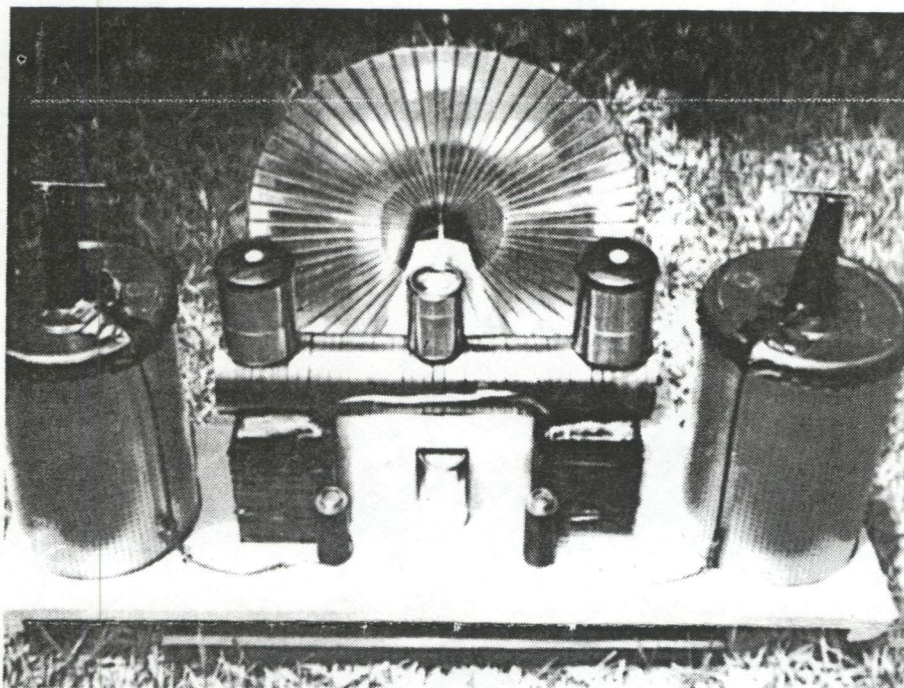
have brought about the rise of monopolies which have functioned at the expense of the planet's environment. It's no wonder that the reported extraterrestrial visitors must consider our planet a wide open insane asylum when we consent to the adoption of dubious energy sources which have the clear potential of destroying the planet and all its inhabitants. It is high time that we take stock of our present position and where we should be going in the years ahead.

The free energy concept

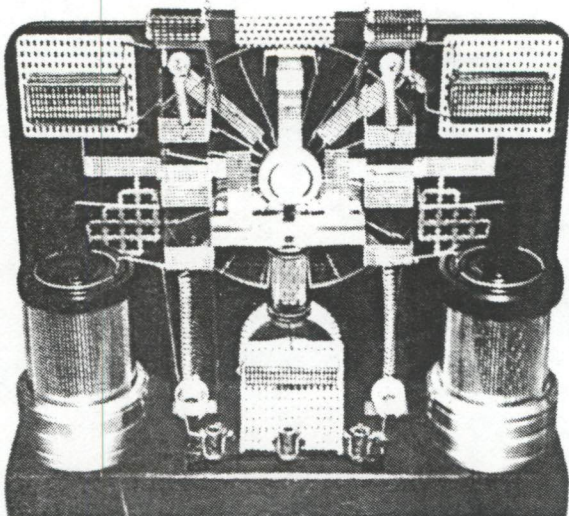
The reality of free energy is not clearly understood by the public

nor establishment science. The concept is too often linked to "perpetual motion," which is not an accurate perception. Perpetual motion machines always evoke images of almost comical proportions, crazy contraptions and their equally nutty inventors. The various members of the scientific establishment who have been exposed to various free energy units usually will ignore or criticize them, or disclaim their validity as operating energy systems.

In actuality, practical free energy machines are quite closely connected to conservation of energy. Several of the successful free energy units depend on a multiplication factor based on applied magnetics or advanced



THE GOAL OF THE NEW MACHINE—Called 'Testatika' by the Swiss group Methernitha, the Swiss M-L Converter utilizes solid-state components to convert its high voltage electricity into useful voltage and amperage.



PHYSIK

Testatika, das "Wunder" von Linden

electrical techniques, plus some degree of space-energy conversion.

Overview of free energy

The radiant energy system of Dr. T. Henry Moray was developed in the mid-1920's through 1950, and this system was demonstrated many times before many witnesses.

The Moray radiant energy (R/E) system was basically an all solid-state system which used many vacuum tubes as the major components of this electrical converter. Dr. Moray closely studied the work of the great Nikola Tesla, and it is believed that he adopted several of Tesla's theories in this R/E system. The so-called

"Moray valve" developed as a component of the R/E system was unique at the time, and since the element germanium was utilized in it, this component is believed to be the forerunner of our present clay transistors.

During a demonstration of the Moray R/E system in 1925, it recorded an output of about 30KW, from a unit about the size of a large microwave oven. Its operation required the use of an approximately 100 foot long wire antenna. While the Moray R/E system was successful, it was very complex, and it is thought that this is the main reason why present day efforts to reconstruct it have been unsuccessful.

Several attempts were made to steal the secret of the device's operation from time to time, and Dr. Moray was shot at on at least one occasion.

Even today, some free energy researchers remain interested in the Moray system and make various attempts to duplicate portions of his circuitry. This is a very advanced, successful free energy system since it requires no power input source after the hand starting of the twin electrostatic discs. The electrical output from the largest working unit, which has been built by the religious commune "Methernitha" in Linden, Switzerland, is between three and four kilowatts, at about 220 volts at 10 ampere/D.C. current.

The Swiss M-L Converter

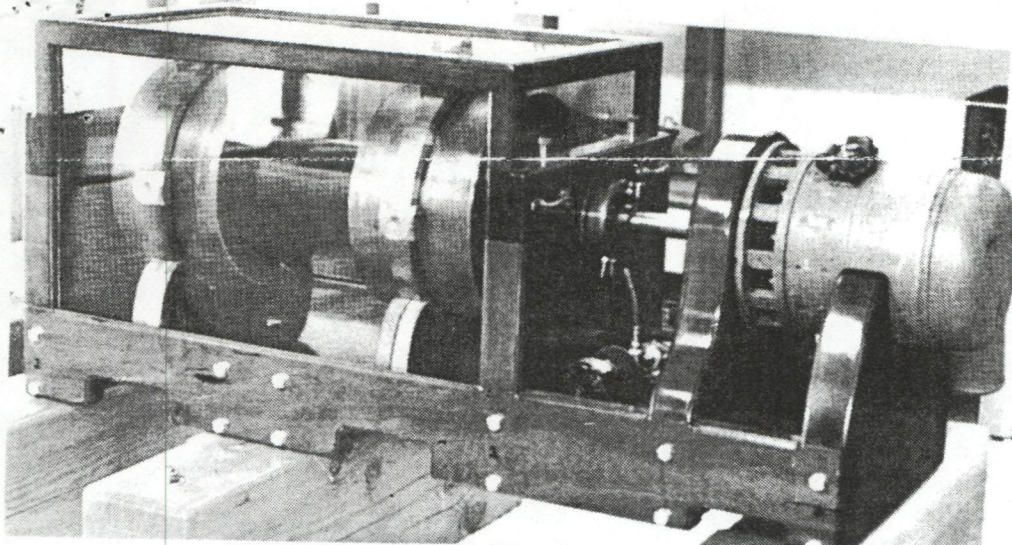
This is a hybrid type of energy system in that it utilizes both dynamic/rotating components; i.e., twin Wimshurst electrostatic discs which produce the initial high voltage and a solid-state portion which converts the high voltage down to useful voltage and amperage. A small feedback circuit at the front of the system also provides the electromagnetic flow for "motorizing" the rotating discs, so that they continue to revolve steadily to produce the high voltage output.

It is now understood that the high voltage produced by the twin discs is converted to useful voltage and amperage levels by large twin capacitive transformers, which are the two large cylinders at both ends of this M-L system.

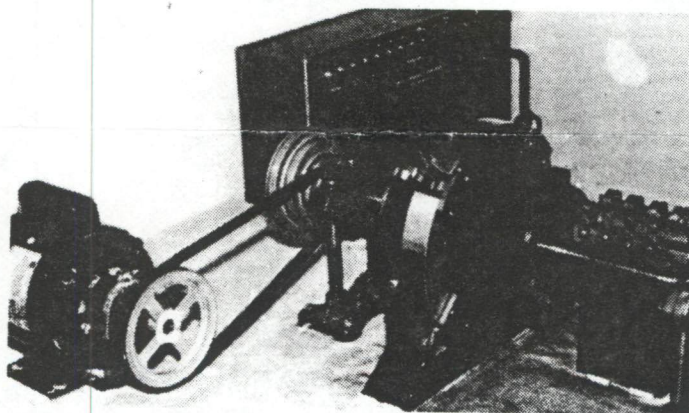
The Swiss M-L Converter is an outstanding example of a true free energy system, and only a few establishment scientists know of its existence.

It is the present policy of the originating group "Methernitha" not to release the details of this remarkable system to any commercial interests, since they believe that the world is not ready for such advanced energy technology. The only real evidence that we have of the operation of this M-L Converter is via a videotape, which is of excellent quality and shows several of these true free energy machines in operation.

Attempts to duplicated this device in the U.S. have not been successful, apparently since some of the



DePalma's working 'N-Machine.'



N-CREDIBLE!—Bruce DePalma of Santa Barbara, California (far right) has successfully conceived and built a functional N-Machine, which can use a device called a Kieninger power collector (at left).



operating components are not yet fully understood and portions of the solid state circuitry are unclear.

The 'N' Machine

The "N" machine is one of the first true free energy machines to be developed by more than one individual free energy researcher or group. In addition to continuing development in the U.S., they are now being built and developed in India, and lately in Japan.

The Japanese are getting involved in both small and large practical version of these "N" machines for the student/educational market and as decentralized power sources for homes and businesses.

The "N" Machine is essentially a large, cylindrical, rotating permanent magnet which is based on the early Faraday disc. When the large magnetic rotor revs at high speeds, it produces high current (amperage) at moderate voltage, making it a nearly ideal electrical power source for many power applications.

There are various problems involved in "N" machine operation which center on the high operating speeds. The high rotating speed aggravates the EMF slip ring transfer to the outside leads, and increases wear and maintenance demands on the main bearings. Various solutions to these operating problems are now being evolved, and much credit must go to Mr. Bruce DePalma of Santa Barbara, California as the U.S. pioneer in this expanding "N" machine technology. It seems to be yet another example of advanced technology which was developed and pioneered in the U.S. but is now being accepted overseas because they more readily recognize its basic value as an alternate energy source.

The three free energy systems cited—the Moray R/E system, the Swiss M-L Converter and the "N" machine—are by no means the only viable F/E systems being developed today! A late arrival on the dynamic converter scene is the Reed Magnetic Motor, developed by Troy Reed of Tulsa, Oklahoma. As

described earlier in this article, these inertial permanent magnetic motors make the maximum use of rotating mass to store energy, but are propelled by a preponderance of repelling magnetic force over the attractive magnetic force vectors in these high-speed, rotating magnetic motors.

New modular system

Another promising free energy modular system is now being evolved by a group in Seattle, Washington. This system is based on the enhanced tank circuit concept, and is a hybrid arrangement since it involves both dynamic and solid-state components. They had originally claimed a 300 percent efficiency level, or 3:1 Over Unity output for their tested hardware, and have subsequently claimed a much higher efficiency level output.

This group is now getting some design support from a prominent electrical engineer from California, and it is expected that they will eventually evolve a practical free energy system in a modular form.

An all solid-state system is now being developed by a retired professional physicist, Dr. Wingate Lambertson of Holmes Beach, Florida. His "WIN" system has been developed over the past several decades and is now reaching the final stages of evolution. Demonstrations of this "WIN" system are now being scheduled by appointment. It is basically a radiant energy converter and is generally similar to the R/E system of Dr. T. Henry Moray, as previously described. It is presently believed that the free energy field will be dominated by the solid-state type of units, since they will eventually offer extended reliability and avoid the maintenance problems which are associated with the dynamic and hybrid types of units and systems.

It is most unfortunate that the American "powers that be" don't recognize what is going on in the free energy field. It looks as if by the time that they finally wake up to its reality—if they wake up—the technology will be lost to the U.S. as a major production opportunity.

Donald A. Kelly is a design engineer whose work experience ranges from F-111 aircraft to alternative energy systems. He is the author of *The Free Energy Manual*.