

SPECIAL ISSUE

the WINGFOOT CLAN



Goodyear Atomic Corporation

A Subsidiary of The Goodyear Tire & Rubber Company

Volume 32

Piketon, Ohio

June 1984

Number 6

"SET V IN '85?"

Declining demand for uranium enrichment, the challenge of competition from foreign countries and a recent excess of enriched uranium in a "secondary market" have had a severe impact on the U.S. Department of Energy's enrichment enterprise and resulted in the need for the United States to cautiously evaluate its long-term plans for its commercial uranium enrichment ventures.

The future of the nation's enrichment

program will depend on the Department's ability to keep its uranium customers. The United States no longer has a monopoly in its enrichment programs, and now must respond to the challenge of competition by moving ahead in the development of new technologies that will reduce costs and allow this country to offer lower-priced enriched uranium services.

A healthier future is predicted for the

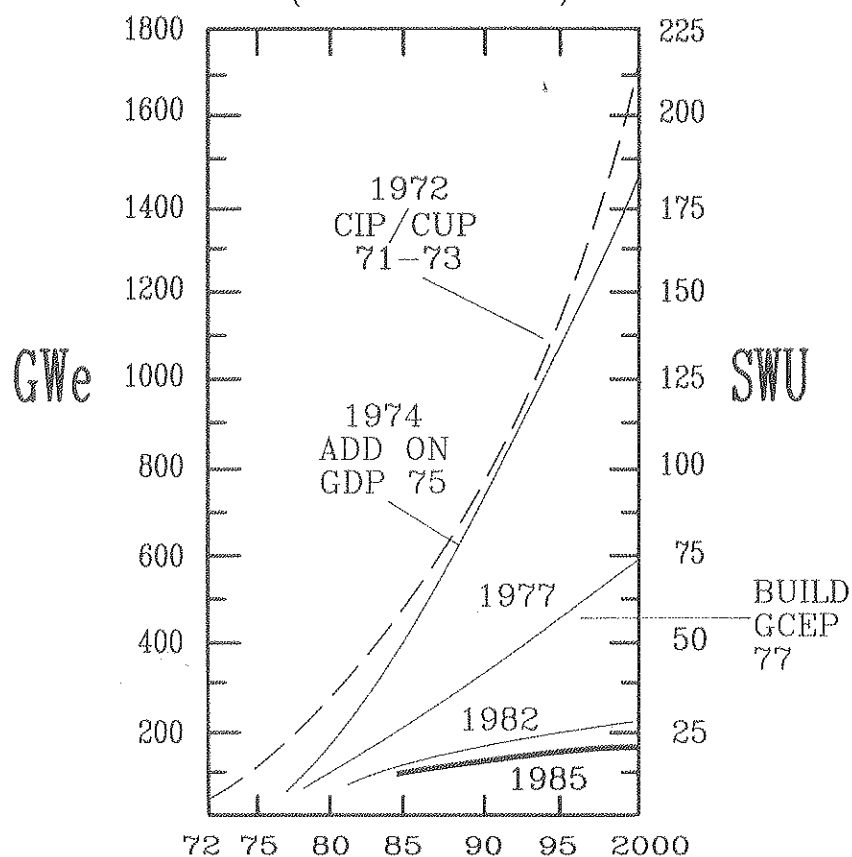
late 1990s as the secondary market dries up and the use of nuclear power begins to increase again as demand for electricity proceeds to accelerate. However, uncertainties over the next 10 years have forced DOE to analyze its overall marketing and production strategy including the introduction of a new contract, the future of the construction of the Gas Centrifuge Enrichment Plant (GCEP), and the most effective development of advanced technologies.

separation, which in turn would lead to low capital and operating costs.

The AVLIS process uses atomic optical characteristics that are unique to each uranium isotope. When laser light is tuned to produce the absorption spectrum of a given isotope, it is selectively ionized (electrically charged). When an electromagnetic field is applied in a separator, the charged atoms are deflected and collected

(Continued on Page 2)

COMPARISON OF TOTAL NUCLEAR POWER FORECASTS (1972-1985)



Power forecasts in gigawatts (one gigawatt = one million kilowatts) through the year 2000 made in the early 1970s were based on DOE estimates of what it would be able to provide in terms of millions of Separative Work Units (SWUs). Initial estimates resulted in the beginning of the Cascade Improvement Program/Cascade Upgrading Program (CIP/CUP). Estimates in the mid-1970s resulted in the initial planning for "add-on" gaseous diffusion capacity and then the 1977 change to gas centrifuge technology based upon its need for lower levels of power. However, a corresponding reduction in electrical demand resulted from conservation, reduced requirements associated with heavy industry and the advent of uranium enriching competition. The current estimate for 1985 reflects the impact of foreign competition and the lag in nuclear power development.

ADVANCED ENRICHMENT TECHNOLOGIES

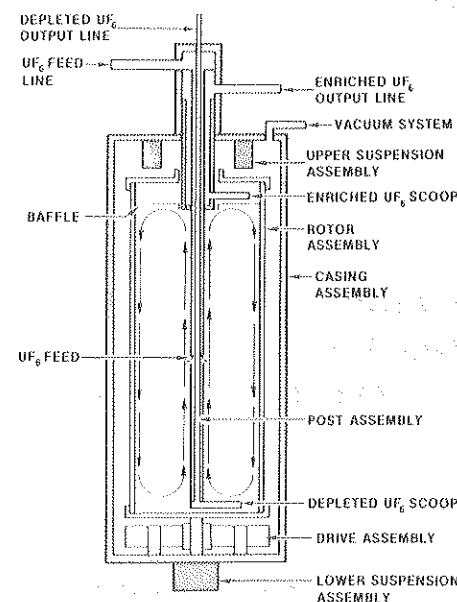
A part of the U.S. Department of Energy's strategy for near-term uranium enrichment is the determination of which advanced isotopic separation process will be selected for further demonstration and deployment. Two advanced uranium enrichment processes currently under development are expected to be significant factors in helping the U.S. maintain world leadership.

One is the Advanced Gas Centrifuge (AGC) — or "Set V" — and the other is Atomic Vapor Laser Isotope Separation (AVLIS).

Both technologies offer the promise of enriching uranium far more efficiently — and less costly — than gaseous diffusion.

In 1982, DOE selected the AVLIS process for engineering demonstration. The technology has the advantage of being a single-stage process rather than a cascade operation and is capable of high-efficiency

SCHEMATIC OF GAS CENTRIFUGE



Special Issue

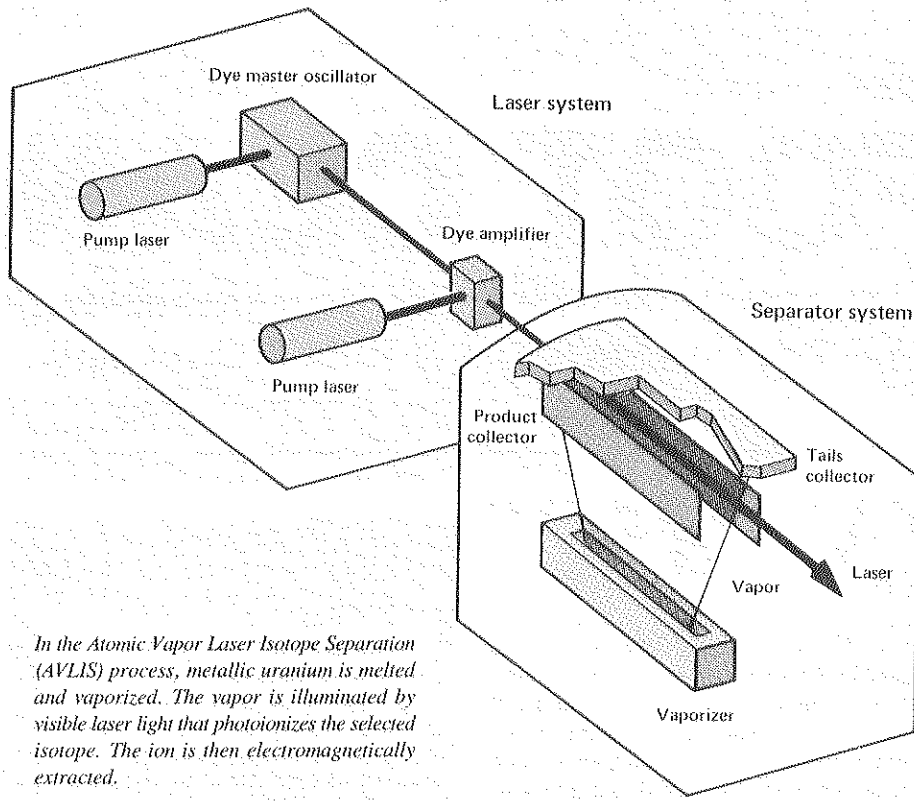
This special issue of Goodyear Atomic Corporation's "The Wingfoot Clan" has been prepared to help acquaint employees with some of the problems and considerations facing the U.S. Department of Energy as it makes decisions relative to the future of its uranium enrichment enterprise.

The newly adopted Goodyear Atomic slogan — "Set V in '85" — will become more evident around the plant as employees work to help insure that centrifuge activities are conducted in a man-

ner that leads to full realization of their technical and economic capabilities and potential.

Several managers were responsible for helping to compile the information and comments included in this issue. Therefore, attribution is not included.

Features and photographs which normally would have appeared in the June issue — including graduate portraits and the second part of the feature on salary benefit changes — will be published in July.



In the Atomic Vapor Laser Isotope Separation (AVLIS) process, metallic uranium is melted and vaporized. The vapor is illuminated by visible laser light that photoionizes the selected isotope. The ion is then electromagnetically extracted.

(Continued from Page 1)

as product while the unselected atoms pass through the separator to form the depleted, or tails, stream. The fundamental selectivity of the AVLIS process is extremely high because the process is based on large differential energy absorption spectra rather than on small mass differences between uranium isotopes. The process is now under development at Lawrence Livermore

Laboratory in California and in Oak Ridge.

Gas centrifuge enrichment technology offers great potential for enrichment because of its low energy consumption per separative work unit (SWU) produced and the fact that its production capability can be added incrementally as required.

In a centrifuge machine, gaseous urani-

um hexafluoride is fed into the casing and accelerated to approximately the speed of the rotor. Centrifugal force causes the heavier U-238 molecules to move to the outside. Lighter U-235 remains near the center, achieving separation.

Present GCEP centrifuge design, known as Set III, has been tested and qualified for production. Advanced centrifuge construction materials are becoming available, so DOE has begun to focus its development program on the advanced concept known as "Set V".

The improved separative capacity of the Set V centrifuge stems from the enhanced specific strength of rotor materials, which permit greatly increased rotational speeds. Because separative capacity is related to rotational speed, the advanced materials offer the prospect of a major improvement in centrifuge performance and economy.

The Department of Energy, its operating contractors and centrifuge machine development and manufacturing firms have had considerable experience with the centrifuge process. Development of centrifuge technology is a step which has already been taken.

AGC VERSUS AVLIS

The Department of Energy is scheduled to decide in May 1985 which is the most promising technology for enriching uranium. Therefore, the determination will then be made whether to continue to expand centrifuge operations or to turn toward laser technology.

DOE has hired an independent third party to provide data for the decision. The department originally had planned to wait several more years before making the choice. But the sharp decline in the government's uranium business means the department cannot afford expensive, long-term development of both technologies.

A House subcommittee studying funding of GCEP proposed that the decision be delayed for an additional year. However, DOE is opposed to this, noting that it has been studying lasers for 11 years and centrifuges for 23 years, and that the department ought to be able to make a decision.

It will be a year-long struggle. Each technology is being heralded by its advocates as the most practical, economic way to go.

(Continued on Page 3)

Comment from the President, OCAW Local 3-689



Bloomfield

There can be no question that most if not all of our futures are at stake in the outcome of decisions to be made on the future of enriched uranium. Both the Gaseous Diffusion Plant and the GCEP Plant are in jeopardy. We must all prepare for these decisions no matter what they may be, but most importantly, we must all accept some responsibility for our future as well.

I am not suggesting that anything should change in regard to our contractual obligations between OCAW Local 3-689 and Goodyear Atomic Corporation. Those obligations will continue through the normal processes that have been in existence since the early 1950's. Negotiations, arbitration, the grievance procedure and other disagreements will follow their normal course.

The responsibility I refer to is as an employee, a taxpayer, a member of our respective communities, churches and other organizations — the responsibility of being an adult. We all must accept the commitment of working together and doing the best job we can. We must forget who is responsible for our predicament, as recalling blame cannot change our current or future situation. We collectively must and can protect our future, but only if we accept reality and act responsibly.

D. W. Bloomfield, President OCAWIU Local 3-689

**U.S. DEPARTMENT OF ENERGY
TOLL ENRICHMENT
SWU'S - REVENUES**

FY	METRIC TONS SWU'S	MILLIONS REVENUE \$	AVERAGE COST/SWU \$
69	1155	30	26
70	3283	84	26
71	8359	220	26
72	6135	181	30
73	7890	252	32
74 (Japan Sale)	15715	542	34
75	8337	351	42
76	11624	643	55
77	10323	674	65
78	12717	922	74
79	14626	1267	87
80	10246	1015	99
81	10769	1203	112
82	13555	1818	134
83	14177	2014	134
84 (EST)	12000	1700	140
TOTALS	160911	12916	

With the advent of the Toll Enrichment Program in 1969, there has been a general increase in the amount of Separative Work Units (SWUs) shipped from the Portsmouth and Oak Ridge plants. However, additional impact is noted in cost, which was \$26 per SWU in 1969 and now averages \$140 in fiscal 1984.

(Continued from Page 2)

John R. Longenecker, deputy assistant secretary for the U.S. Department of Energy and director of Uranium Enrichment and Assessment, has described the criteria DOE will use in its assessment. "Technical evaluation and relative economics are major concerns. We need to look at the technical feasibilities of both concepts."

"Another factor is the privatization potential, which," Longenecker said, "is the relative attractiveness of one or both to the private sector. We have to ask ourselves 'which one would they buy?'" Longenecker said. "Risk analysis and return on investment are two factors private industry always examines, and this is no exception for DOE."

GASEOUS DIFFUSION PLANT SHUTDOWNS

At the same time, the Department of Energy is considering the extended age of the three U.S. gaseous diffusion plants and the fact that they are expensive to operate because of high electricity requirements. In the not-too-distant future, one of the three probably will be closed down.

With the completion of the new contract conversion in October and the technology choice in May 1985, DOE will have enough data to complete its long-range plans, which will include deployment of the selected technology and shutdown of gaseous diffusion capacity.

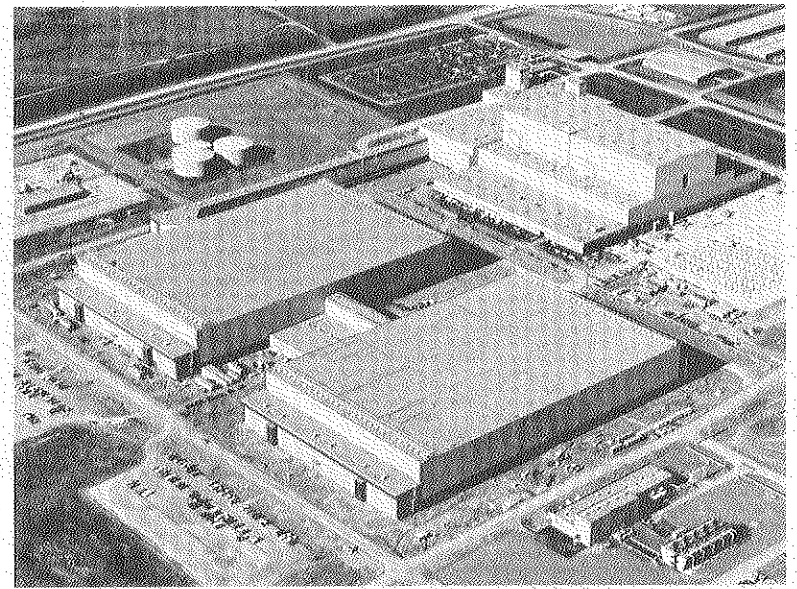
POTENTIAL IMPACT AT PORTSMOUTH

The next 12 months are very crucial to the employees of Goodyear Atomic Corporation. As operator of both GDP and GCEP, the federal decisions are very important to the future of Goodyear Atomic, its employees and its civic presence in Southern Ohio.

The AGC/AVLIS decision will play a major role in determining the future of GCEP. Construction beyond the first two process buildings will be determined by which technology DOE decides to pursue

Potential key to enrichment future

Completion of the Portsmouth Gas Centrifuge Enrichment Plant (right) will enable the United States to provide enriching services at lower cost based on advanced technology and lower power requirements.



COMPARISONS (U.S. DOLLARS)

	U.S.	URENCO	EURODIF	USSR
CURRENT	138/149	117	100	124
1980	98/108	145	160	100

SECONDARY MARKET 80-125

U.S.	13.5 MILLION SWU's
NON-U.S.	23.0 MILLION SWU's
TOTAL	36.5

Competitor and secondary prices

Prices charged for uranium enrichment services by this country's foreign competitors are lower than those charged by the United States, which is primarily due to the strong dollar and weak foreign currencies. The U.S.S.R. also systematically undercuts the United States price. The lag in nuclear power development in the U.S. as well as abroad has resulted in a surplus of enriched uranium causing the development of a secondary market which discounts current SWU prices.

and responses to a new contract the department is offering to its uranium customers.

If the advanced gas centrifuge process is selected as the most feasible technology, the Set V machines could possibly be installed in the two GCEP buildings now under construction as early as the late 1980s. More buildings and more machines could be added with predicted increases in demand for enriched uranium and to replace the more expensive gaseous diffusion capacity.

However, the enrichment expansion outlook for Portsmouth might differ significantly should the laser technology be selected. The Department of Energy would need to decide if and how much further to proceed with GCEP and centrifuge development, if centrifuge enrichment might become a back-up for laser processes and whether or not to incorporate the laser process at the GCEP site or locate it elsewhere.

These are important considerations which DOE will be cautiously reviewing in order to arrive at a long-range plan which will provide best utilization of technologies, resources and personnel in order to bring the international lead in uranium enrichment back to the United States. The management and employees of Goodyear Atomic believe that the GCEP



Brewer

Comment from the President, UPGWA Local 66

The time of cooperation has arrived at our facility. There are no alternatives, the cooperation of Labor and Management is one of the answers to the continued existence of the entire facility of which we are a part. There is only one road to take, that being the one consisting of an agreed upon goal, a well planned procedure and a totally concerted effort to attain that goal which is of an imperative necessity to each and every employee of Goodyear Atomic Corporation.

The luxury of past years when the U.S. nuclear program enjoyed a virtual international monopoly has disappeared and we are at present in a fight for our economic survival. The lead in technology, productive capacity and marketing capability, particularly in the international market, may be recovered with a dedicated effort by all people involved in each phase of the nuclear program.

Therefore, in view of the responsibility to ourselves, our families and our communities, the members of Local #66, UPGWA and myself pledge an "All-out" cooperative effort to retain the entire facility as a viable efficient operation for the Department of Energy.

R.G. Brewer, President Local #66, UPGWA

the WINGFOOT CLAN

GOODYEAR ATOMIC CORPORATION
A subsidiary of The Goodyear Tire & Rubber Company
Acting Under

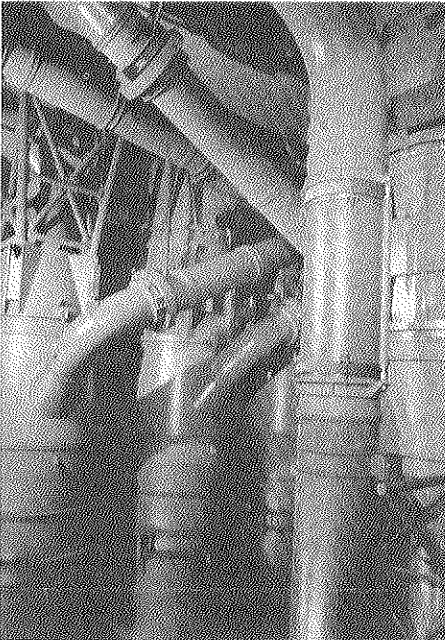
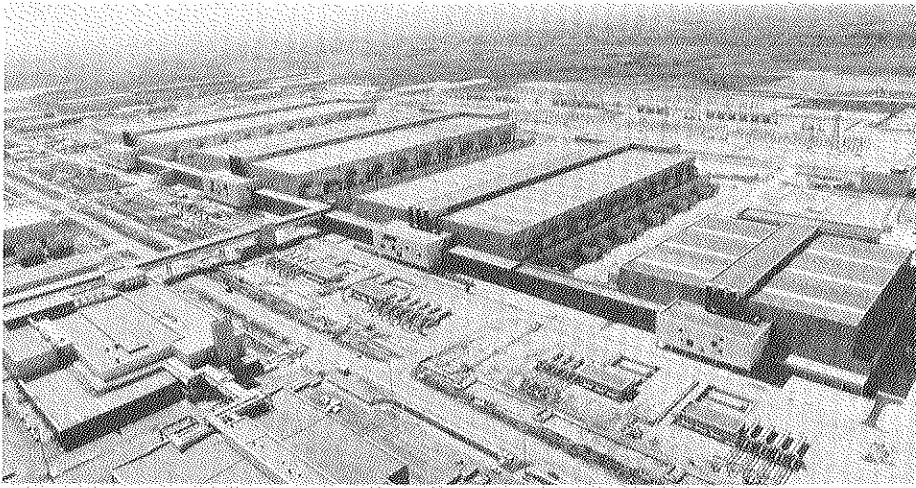
U. S. Department of Energy
Contract DE-AC05-76OR0001

Published Monthly in the Interest of Employees of the
GOODYEAR ATOMIC CORPORATION
An Equal Opportunity Employer

PUBLIC COMMUNICATIONS
X-100 Building
P. O. Box 628
Piketon, Ohio 45661

EDITOR.....Tim L. Matchett
Telephone...(614) 289-2331 Ext. 2863

(Continued on Page 4)



Prime competitor

Eurodif's French gaseous diffusion plant (above), near Tricastin, is the basis for the United States' most fierce competition in the marketing of uranium enrichment services to free world countries. At left are a few of its vertically positioned gaseous diffusion stages. Diffusion equipment in the United States' three plants is positioned horizontally. Power to the French plant is provided by four adjacent 950 MWe nuclear power stations, which results in a significant degree of cost efficiency.

High capacity

The current enriching capability in the U. S. is greater than 27 million SWUs per year. This can be supplemented by foreign enriching capability of 15.3 million SWUs per year. If current enrichment plans are carried out, a capability of more than 75 million SWUs would exist in the post-1990s. This enriching capability exceeds that which is required worldwide. NOTE: The acronym WOCA stands for "World Outside Communist Areas" (the Free World).

(Continued from Page 3)
plant and program can be a significant and dynamic force in regaining this lead.

The efforts and hard work of many people were rewarded in 1977 when the decision was made to place GCEP in Pike County. The project has an excellent track record, has adhered to its timetable for completion and is near its projected budget.

The GCEP project has already survived some intense Congressional battles and there could be more.

However, area construction contractors, employees of the DOE Portsmouth Project Office, local suppliers and Goodyear Atomic personnel have worked to prove that Southern Ohioans can contribute very effectively and efficiently to both the GCEP project and this nation's overall uranium enrichment effort, and plan to continue to work diligently to prove the merits of the GCEP process. But, regardless of which enrichment technology is pursued and the overall long-range plans for the U. S. program, we must look forward with optimism toward maintaining a vital stake in DOE enrichment ventures.

SWU REQUIREMENTS OF WORLD NUCLEAR POWER GENERATING COUNTRIES USING ENRICHED URANIUM (millions)

Group	Number of Countries	1985	2000
United States	1	9	17
Non-Aligned	15	3	9
Independent	2	1	1
Eurodif	4	4	10
Urenco	3	3	6
U.S.S.R.	8	5	7
TOTAL	33	25	50
WORLD CAPACITY	(SWU)	50	82

There are only 37 countries in the world today which have active nuclear power programs. Four of these have nuclear programs which utilize natural uranium, and as a result, do not require enrichment services. The current requirements for worldwide power reactors utilizing enriched uranium are approximately 25 million SWUs. Unless nuclear power programs are greatly accelerated, this requirement will only double by the year 2000.

ENRICHING CAPACITY AVAILABLE WOCA

U.S.	SWU/YEAR	
	1984	Post 90
GDP	27.3	27.3
ADVANCED TECHNOLOGIES	--	13.2
NON-U.S.		
EURODIF	10.8	10.8
URENCO	1.0	10.0
USSR	3.0	>3.0
JAPAN	<.1	4.0
UCOR	0.3	.3
BRAZIL	0.2	.2
COREDIF	---	7.0
	<u>42.6</u>	<u>75.7</u>

CURRENT STOCKPILE 36.5 MILLION SWU's

WHAT CAN GAT BE DOING?

To assist DOE in maintaining a healthy uranium enrichment program, it is important that we all show a strong, concerted effort to continue to operate the Portsmouth plant in a manner that is cost effective, reliable and efficient.

This is not the time for inconsistency in operation of the Portsmouth plants. We must continue, and increase, our attention to quality assurance and control, employee health and safety, cost reduction and environmental protection. We must work to continue to maintain GCEP costs and operational schedules.

Decisions made by DOE must be based on complete and accurate information. When the research has been completed DOE can look at the facts and make the decision that it is best for the nation's enrichment enterprise.

R. A. Burkley L. R. Hoyt

D. E. Carver N. H. Hurt

V. J. DeVito W. R. Schultz

R. L. Shepler

Pikeston, Ohio
BULK RATE
U. S. Postage
PAID
Permit No. 11

Goodyear Atomic Corporation
P. O. Box 628
Pikeston, Ohio 45661
Address Correction Requested