OAK RIDGE NATIONAL LABORATORY

Operated by
UNION CARBIDE NUCLEAR COMPANY
Division of Union Carbide Corporation

Post Office Box X
Oak Ridge, Tennessee

EXTERNAL TRANSMITTAL
AUTHORIZED

ORNL
CENTRAL FILES NUMBER

59-3-91, Rev. 1

DATE: June 25, 1959
SUBJECT: Eurochemic Assistance Program:
Comments by BNL, dated February 17, 1959,
on Eurochemic Documents
TO:
FROM: E. M. Shank, ORNL
B. Manowitz, BNL

COPY NO. 41

Acknowledgment

The attached comments were given by BNL personnel on various Eurochemic documents sent to ORNL for USAEC review. The comments have been retyped at ORNL, after official release, to permit general distribution.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

LEGAL NOTICE

This report was prepared as an account of Government sponsored work. Neither the United States, nor the Commission, nor any person acting on behalf of the Commission:

- A. Makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or
- B. Assumes any liabilities with respect to the use of, or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.

As used in the above, "person acting on behalf of the Commission" includes any employee or contractor of the Commission, or employee of such contractor, to the extent that such employee or contractor of the Commission, or employee of such contractor prepares, disseminates, or provides access to, any information pursuant to his employment or contract with the Commission, or his employment with such contractor.

I have reviewed the Eurochemic reports sent to me thus far. In general, a thorough survey has been made of the aqueous reprocessing field. I was particularly impressed by the proposed development program which parallels several programs in this country.

The following specific comments are offered by Carl Pierce and myself:

1. The use of NO_2 gas in place of NaNO_2 in the first valence adjustment step should be investigated, since the sodium limits the degree of concentration of the high level waste stream.
2. When considering the use of a sorption step (inorganic anion exchanger) in place of an extraction step, the solids waste handling and disposal problems should be critically evaluated. This probably need only be considered for sorption steps upstream of the tail-end treatment.
3. A change in the flow sheet stream nomenclature is recommended for ease of exchange of data between the U. S. and Eurochemic. Use of such designations as 2ASv and 1CSt seem cumbersome.
4. The flow sheet calls for do-decane as a diluent. The use of this diluent seems to be extravagant considering a cooling time of 100 days and the limited amount of data on the use of do-decane. Consideration of a diluent other than kerosene base type probably would be required only if the dual-temperature scrub process is used.

Some consideration should be given by the Eurochemic group to the problems of shipping spent fuel and the handling of shipping casks at the plant. Uniformity of shipping containers would reduce the investment required to handle the containers.

Consideration should be given to the use of the recently designed critically safe mixer settler units. These units can be operated with total flow rates of 15 l/min. and are critically safe with concentrations of U-235 up to 400 grams/liter.

H. L. Finston has indicated that emission spectroscopy will probably play a greater role in the analytical program than anticipated, and suggests that more thought be given to required instrumentation and related facilities.

I might bring to your attention the relatively cheap yet accurate U-235 isotopic assay by neutron activation developed at Fernald. F. L. Cuthbert might be contacted for further information.

We are particularly interested in the Eurochemic report on waste disposal, which we assume will soon be forthcoming. We are withholding comments in this area until we can review their plans.

The following are pertinent BNL documents:

Waste

BNL 446 - Studies on Characteristics of Savannah River Wastes, April 1957

BNL 493 - An Absorption Process for Recovery of Fission Product Noble Gases,
February 1958

The Recovery of Fission Product Xenon and Krypton by Absorption
Processes (to be issued)

Head End Processes and Corrosion

BNL 511 - Reprocessing of Power Reactor Fuels - The Enrico Fermi Fast
Breeder Reactor Fuel - Progress Report #1

Reprocessing of Power Reactor Fuels - The Enrico Fermi Fast
Breeder Reactor Fuel - Progress Report #2 (to be issued)

It is suggested that ex-KAPL personnel be contacted for possible assistance. A. C. Schafer (ORNL) might be a lead to the location of appropriate personnel. In addition, Dr. Silverman at Harvard could assist on gaseous waste disposal, and the Bettis Plant has information on solids waste disposal.

I note that consideration will be given to the loan of U. S. personnel to the Eurochemic group. On a short-term basis, I think this would be valuable experience for Carl Pierce. At the same time he could provide valuable assistance to the Europeans.

Internal Distribution

1. E. M. Shank
2. R. E. Blanco
3. J. C. Bresee
4. K. B. Brown
5. F. R. Bruce
6. F. L. Culler
7. W. K. Eister
8. H. E. Goeller
9. D. E. Ferguson
10. A. T. Gresky
11. R. B. Lindauer
- 12-13. M. J. Skinner
14. Central Research Library
15. Document Reference Section
- 16-23. Laboratory Records
24. Laboratory Records-RC

External Distribution

- 25-26. F. L. Cuthbert, FMPC
- 27-28. I. G. Dillon, ANL
- 29-30. O. F. Hill, HAPO
- 31-32. B. Manowitz, BNL
- 33-34. V. R. Thayer, du Pont
- 35-36. M. E. Weech, ICPP
- 37-39. Technical Exchange Branch, DIA
40. Research and Development Division, ORO
- 41-55. TISE