

ments taken by the recent aerial radiological survey.

The average external dose for Eneu residents is calculated using measurements of external radiation and estimates of time spent in various areas of the island.

The average internal radiation dose is calculated using estimates of the amounts and kinds of food in the diet and measurements of the radionuclide content of these foods and of drinking water.

*Interior and Related Agencies Subcommittee, Committee on Appropriations, House of Representatives.

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However, it is believed that any individual will not exceed a daily intake, averaged over a year, greater than two times the estimated average daily intake. (See Enclosure 1.)

FEDERAL STANDARDS

To comply with Federal Radiation Standards, certain conditions must be met. First, the average whole body dose to the population should not exceed 170 mRem/Yr. Second, when the dose to individuals is known, the whole body standard is 500 mRem/Yr. To comply with this requirement for Bikini Island residents the monitoring program to measure the dose to individuals was begun five years ago. Third, the dose to bone marrow of individuals should not exceed 500 mRem/Yr. Because of the way certain radionuclides are deposited in the body, bone marrow doses are expected to be higher than whole body doses. Thus, the bone marrow standard for individuals will probably be controlling at Bikini Atoll. Fourth, the average whole body dose over 30 years to the population should not exceed 5,000 mRem.

CALCULATED DOSE

The calculated doses shown below are for two living patterns and for two assumed diets. The diets are based on the recent experience and observations of the scientific teams who have been working on Bikini Atoll.

Calculated Maximum Annual Dose (Average for Population)

A. People live 100% of the time on Eneu Island.

	<u>With Food Imports</u>	<u>Without Food Imports</u>
Whole Body	120 mRem/Yr.	210 mRem/Yr.
Bone Marrow	140 mRem/Yr.	260 mRem/Yr.

B. People live 80% of the time on Eneu Island and visit Bikini Island 20% of the time, but assumes no food from Bikini Island is eaten.

	<u>With Food Imports</u>	<u>Without Food Imports</u>
Whole Body	170 mRem/Yr.	260 mRem/Yr.
Bone Marrow	190 mRem/Yr.	300 mRem/Yr.

Because of the difference in the amount and kind of food eaten, the dose to some individuals in the population may be two times that shown above.

Calculated 30-Year Dose (Average Whole Body)

A. People live 100% of the time on Eneu Island.

<u>With Food Imports</u>	<u>Without Food Imports</u>
2,700 mRem	4,700 mRem

B. People live 80% of the time on Eneu Island and visit Bikini Island 20% of the time, but assumes no food from Bikini Island is eaten.

<u>With Food Imports</u>	<u>Without Food Imports</u>
3,700 mRem	5,700 mRem

Note: People who recently lived on Bikini Island have already received a dose of about 1,000 mRem. Should they return to live on Eneu Island the 30-year dose estimate would have to include all (or part) of this dose if return occur within the next 30 years.

From the average doses for Eneu residence shown above (maximum annual and 30-year), doses for increased utilization of Bikini Island can be determined by applying the finding that Bikini doses equal eight times Eneu doses. Also, the impact on these estimates of delaying the return to Eneu and Bikini can be determined using the finding that the radioactivity of the two radionuclides, Cesium-137 and Strontium-90, that contribute most to whole body and bone marrow doses, are decaying with an effective half-time in the environment of 30 years.

Enclosures 2 and 3 present estimates of the maximum annual whole body and bone marrow doses for the highest individuals if, starting with 1979 as the zero time, the return to live on Eneu Island is delayed (four cases), and if return to Bikini Island is delayed (one case). Enclosure 4 shows the same kind of information for 30-year doses.

DISCUSSION

The calculated maximum annual whole body and bone marrow doses for the Eneu Island population can be compared with the 170 mRem/Yr. standard. If a monitoring program is in place, and it is assumed this will be the case, doses to individuals that are two times

standards for 30 to 50 years. For Bikini Island, 100 years
is predicted but it is difficult to make estimates over so long
a time.

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DIETS

	<u>ENEU ISLAND FOODS ONLY</u>	<u>ENEU ISLAND AND IMPORTED FOODS</u>
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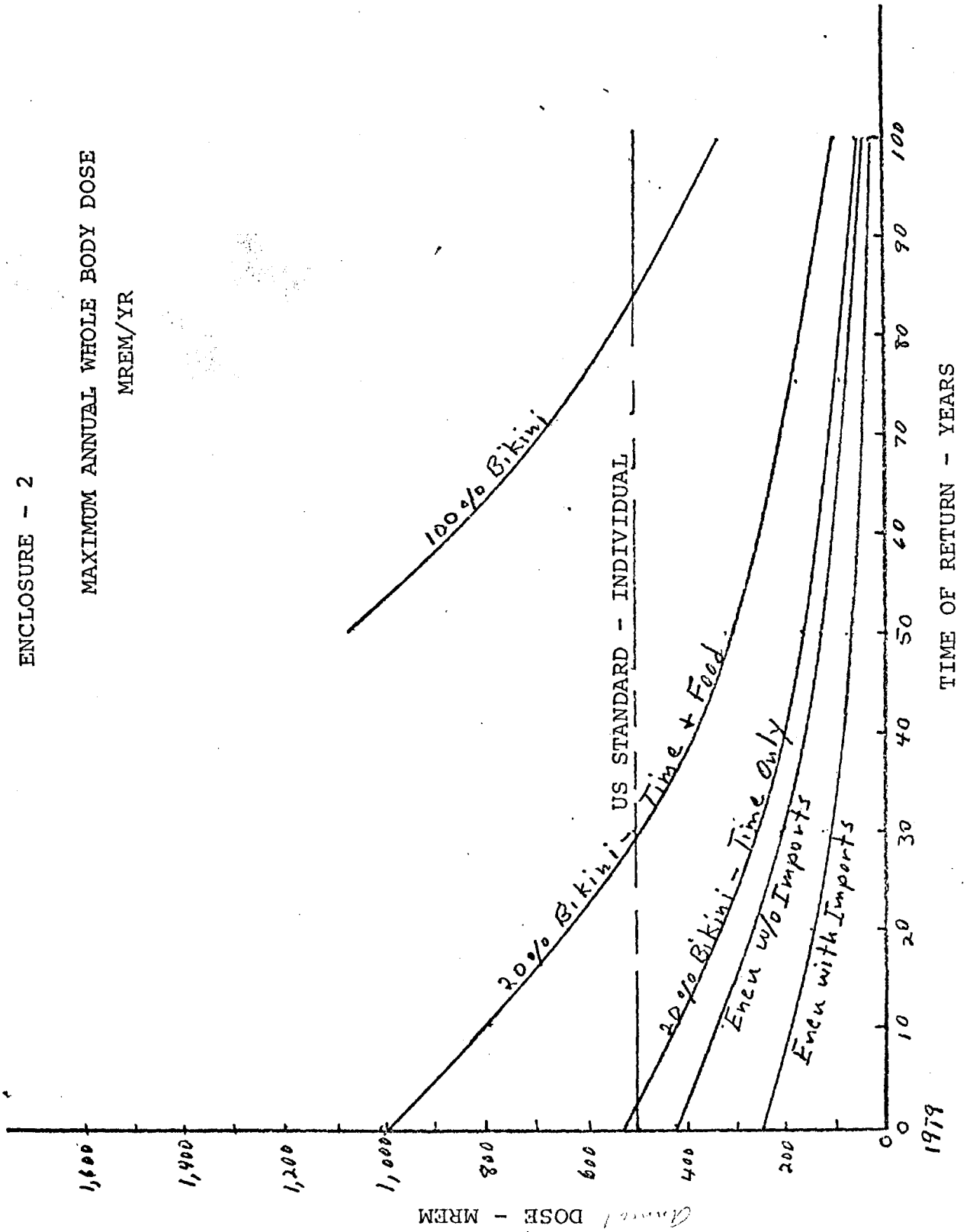
	<u>INTAKE G/DAY</u>	<u>INTAKE G/DAY</u>
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FOOD ITEM

FISH	600	300
DOMESTIC MEAT	50	20
PANDANUS FRUIT	75	15
BREADFRUIT	200	100
WILD BIRDS	10	-
BIRD EGGS	5	-
COCONUT FLUID	300	200
COCONUT MEAT	100	50
CLAMS	25	15
GARDEN FRUITS AND VEGETABLES	50	30
	<hr/>	<hr/>
TOTAL	1415	805
IMPORTED FOODS		610
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TOTAL		1415

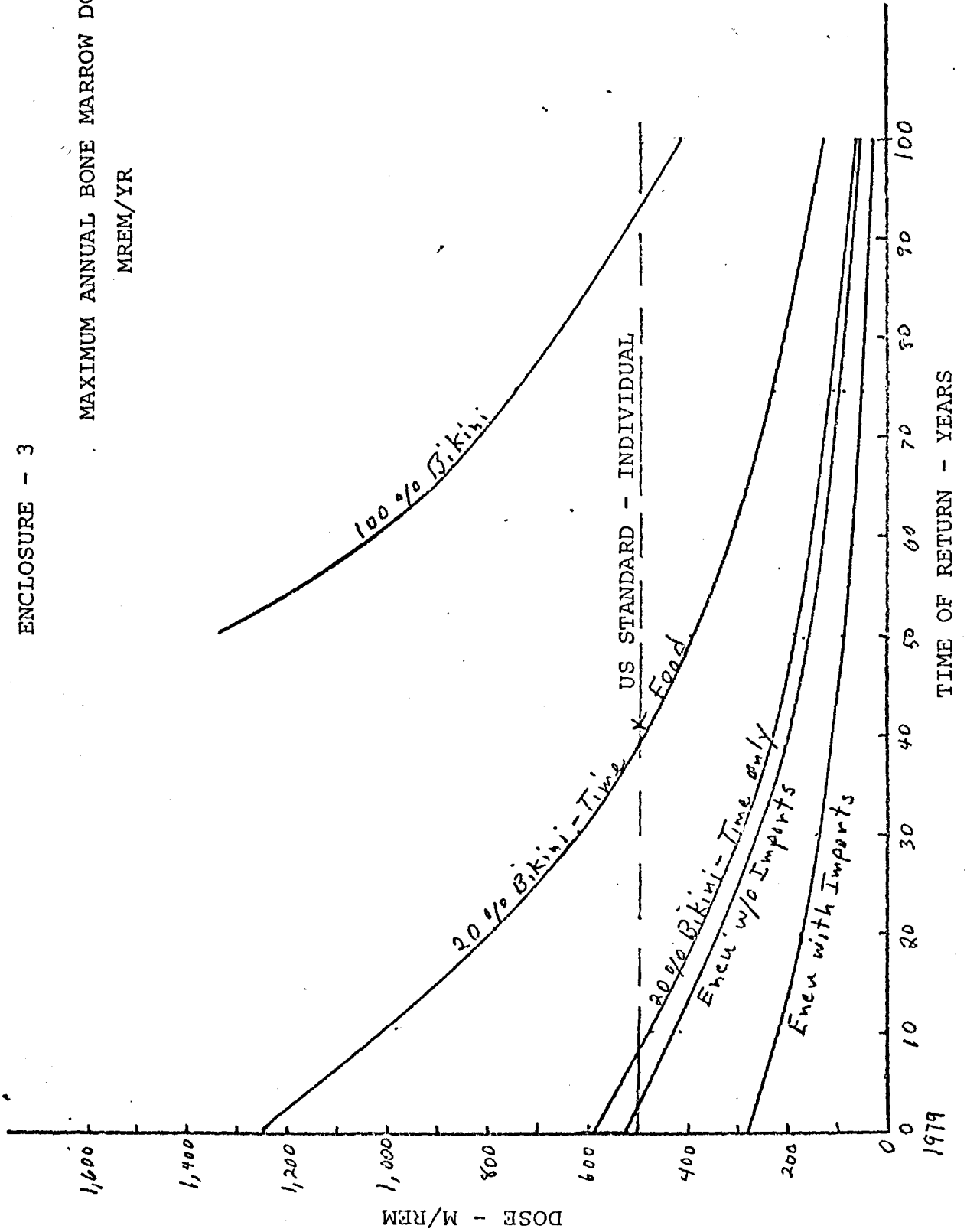
ENCLOSURE - 2

MAXIMUM ANNUAL WHOLE BODY DOSE
MREM/YR



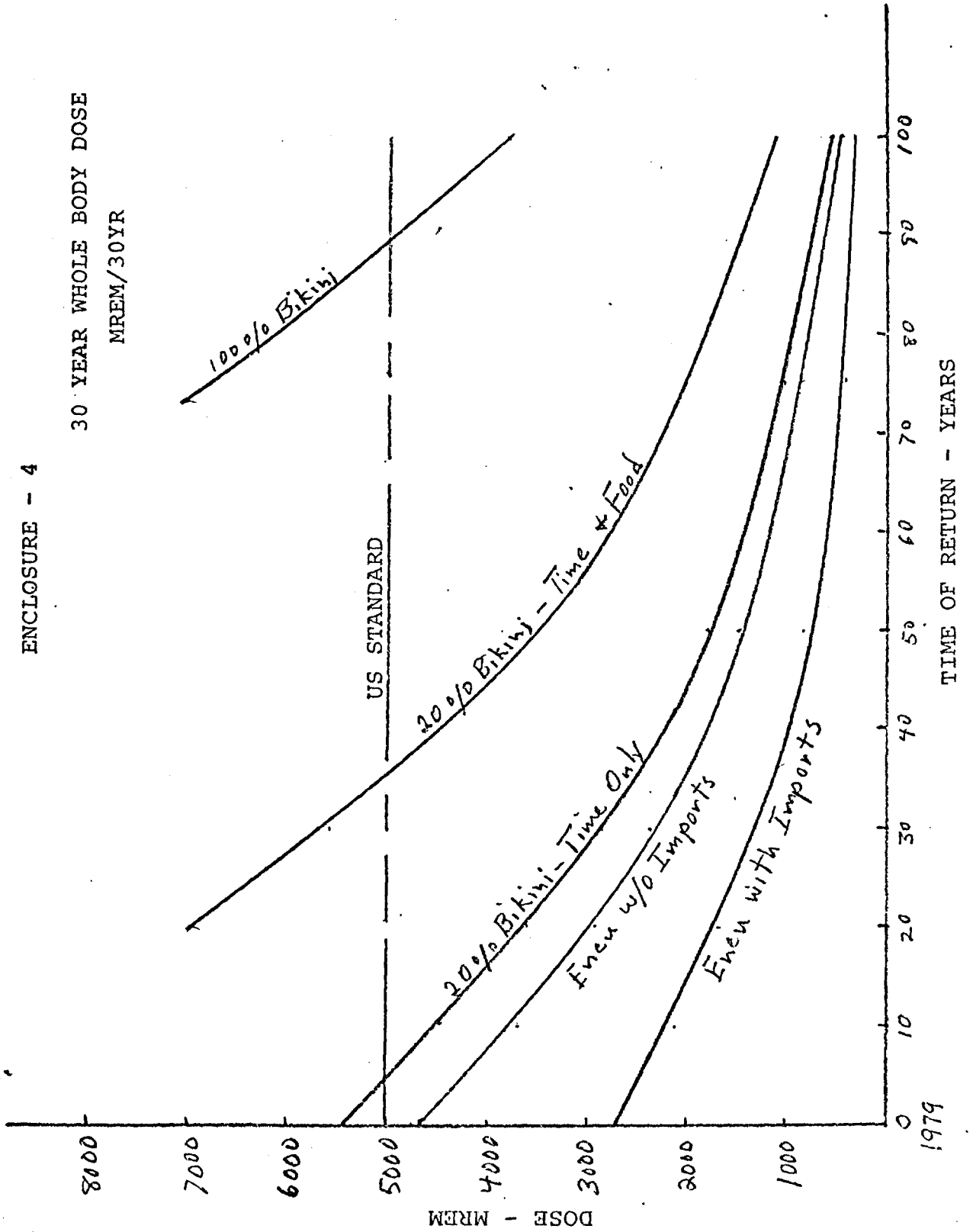
ENCLOSURE - 3

MAXIMUM ANNUAL BONE MARROW DOSE
MREM/YR



ENCLOSURE - 4

30 YEAR WHOLE BODY DOSE
MREM/30YR



1979

REPOSITORY PNNL
COLLECTION Marshall Islands
BOX No. 5684
FOLDER Bikini - 1979

DOCUMENT DOES NOT CONTAIN ECI

Reviewed by R. Schuette Date 4/30/97