DEPARTMENT OF ENERGY

POSITION PAPER

FOR

MARSHALL ISLAND STUDY

FROM

BROOKHAVEN NATIONAL LABORATORY

DECEMBER 1, 1978

INTRODUCTION AND STATEMENT OF PROBLEMS

On October 3, 1978, a meeting was held at the Department of Energy (DOE) Headquarters in Germantown, Maryland, to discuss a number of problems related to the DOE position in relation to several different programs in the Marshall Islands.

The Medical Program, under the auspices of Brookhaven National Laboratory (BNL), generated a great deal of discussion, concerned primarily with the following problems:

1. The research mandate of BNL for the study and care of radiation related diseases in the exposed populations is clear. However, over a period of twenty-five years, that mandate has been expanded to include care for non-radiation related diseases. This evolution has been necessitated by the virtual absence of adequate primary care in the Marshall Islands. The BNL medical team has responded in a humanitarian manner to diagnose, treat and follow-up a number of pathologic conditions which, if untreated, would have led to increased morbidity and mortality in the exposed and control groups.

   A. Basically, the BNL Medical Program is a medical research program. Its original goal was to "screen" for and detect the earliest changes suggestive of radiation-related pathology, and to treat those lesions as indicated. (The World Health Organization (WHO) states the primary responsibility of any screening effort is the ability to resolve all "abnormal" findings and to assure the patient of referral to an adequate primary care center.)

RELEVANT ?

B. The difficulties are compounded by the fact that valid pre-exposure health care statistics are difficult or impossible to obtain. The Medical Program is in the untenable position of having to deal often with the probability that a specific pathologic condition is or is not related to radiation exposure, since a cause-effect relationship is impossible to establish definitely for any given case.

WHY UNTENABLE?

WHY IS THIS DETERMINATION ESSENTIAL?

C. The people are intellectually and emotionally unable to deal with the concept of "probability" without an intensive, highly-sophisticated educational program designed not only to transfer the information intellectually regarding the role of radiation in their lives, but to concomittantly incorporate that new understanding into their behavior, i.e., the ability to place radiation in its proper perspective for the present and the future. Such a program has already been initiated by Jan Naidu, Ph.D., BNL, with promising results.

WHO SAYS?

2. The Marshall Islands medical "system" under the Trust Territories is underfinanced. The professional staff is undertrained and overloaded. Critical supplies are usually not available.

A. In the absence of a satisfactory primary care referral base, the BNL Medical Program has expanded its mandate to include such things as a "diabetic study" (which has revealed a high incidence of "maturity onset diabetes") but has set up no mechanism for treatment and follow-up of this disease.

CONTRACTOR EXPANDS OWN SCOPE?

B. In addition, at the request of the people, a large number of Marshallese who were not in the exposed or control groups have gone through the screening examination with the detection of a variety of pathologic conditions. An attempt has been made in

each case to provide immediate treatment if possible, and to refer the patients to the Trust Territories health care system. Unfortunately, little has been done to treat and to follow-up these patients. Consequently, the BNL medical team has become the de facto primary health care provider to an ever expanding group of Marshallese. The rationale of the Marshallese in the BNL program for their claim to the "right for all medical care" is their association of practically all illness with radiation.

BY WHAT AUTHORITY ?

US IMPACT HAS NOT BEEN SOLELY RADIATION EXPOSURE.

3. The BNL medical team, because of its frequent surveys has, in the eyes of the Marshallese, come to represent the U.S. "presence" in the islands. The BNL Medical Program has, therefore, become the target of many attacks directed towards the United States agencies responsible for other programs in the Marshall Islands. These unwarranted attacks have, on several occasions, seriously compromised the goals of the Medical Program. Two major problems of health care delivery for all of the Marshallese involve: (a) communications, and (b) transportation. To the best of our knowledge, these problems have not been addressed independently as health care problems.

A VERY AND BROAD LARGELY INACCURATE STATEMENT

## DISCUSSION

With the slow growth of the medical program and the development of this matrix of compounding variables, Dr. Burr and Dr.Wyzen requested a position paper that would outline for DOE the alternatives for the support of a study of radiation related injuries in the Marshall Islands. These options should include a wide spectrum of alternative programs, keeping in mind the inextricable

IS THIS REALLY OUR PURPOSE ?

interrelationship between BNL screening and the health of the people of the Marshall Islands. We feel a failure to deal effectively, in some way, with the primary care requirements of the people will lead to further ill-will, failure to comply with the research protocol (e.g., thyroid therapy), and finally, litigation and a call to foreign and national anti-nuclear groups to witness the "mistreatment" of the Marshallese by the U.S. government. Since primary medical care is clearly not the mandate of the DOE, perhaps some interdepartmental agreement could be reached with the Department of Interior and/or the Department of Defense to answer this very pressing problem. U.S. monies are already going to the Trust Territories to provide health care but the utilization of those funds leaves much to be desired.

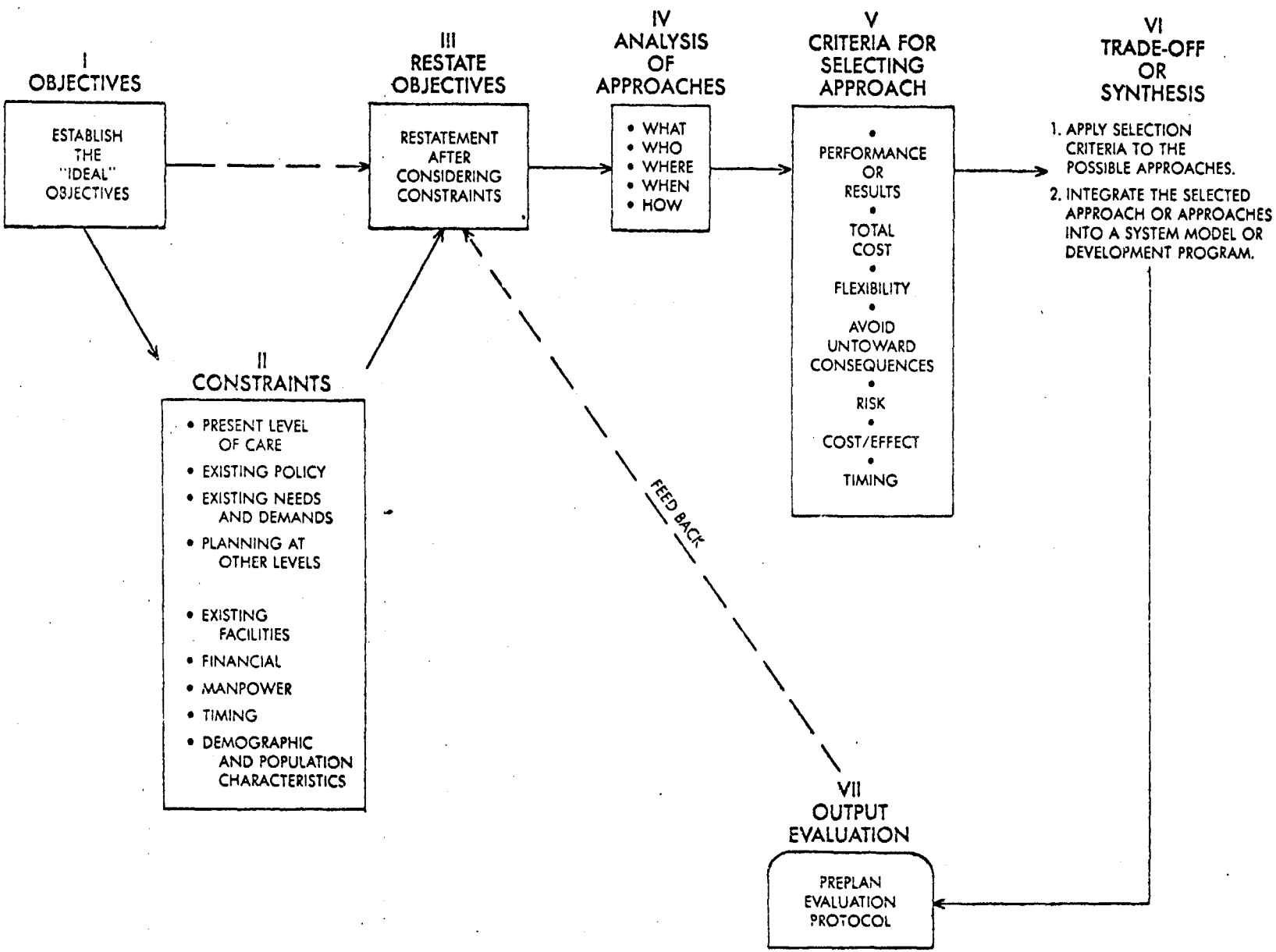
WHERE IS THE ACCEPTANCE OF A MORAL OBLIGATION TO CARE FOR INJURED PEOPLE?

The analysis of options open to DOE-BNL has been approached in a system analysis format, utilizing an outline as developed by Gordon A. Friesen, of the General Electric Company, Re-Entry Systems Department (Figure 1, page 5).

As in any general systems analysis format, some of the elements will be indeterminant on the basis of available information. In the analysis of "constraints" to the various options, two important facts should be kept in mind. First, there will be a common group of constraints applicable to most options. These constraints will be listed at the end of this section. Pertinent general constraints will be listed by number in Column II (labelled constraints) on the flow sheets for each option. Secondly, constraints should be considered in two categories:

1. Absolute - by definition, an absolute constraint offers no alternatives; in effect, it totally blocks an objective or element of an objective (e.g., no funds);

# FLOW DIAGRAM FOR AN ANALYSIS OF THE OPTIONS



2. Relative - these constraints impose a varying degree of modification on the objective, proportional to the power of the constraint (e.g, 20% of the funds necessary to reach the objective).

Using this format, we will examine four options relating to the detection and treatment of:

A. Thyroid and other radiation-related diseases in the exposed and control populations.

B. All of A plus other patients already taken into the study with non-radiation related diseases (e.g., diabetes). This would include exposed and control group patients only.

C. All of A and B plus all low level radiation exposed patients who have gone through full screening, irrespective of findings of disease,(e.g., the Bikini group).

D. All of A, B, and C plus full screening of all inhabitants living on, or scheduled to be repatriated to, the Marshall Islands contaminated by atomic fallout; i.e., background radiation higher than median for all Micronesian islands.

FORMER RESIDENTS

DO WE KNOW THIS NUMBER ?

HOW MANY ISLANDS QUALIFY ?

With these four options in mind, we must first consider the common constraints impinging on the subheadings listed under Column II of the flow sheet (see Figure I). The unique constraints for each option will be listed as appropriate. The common constraints are:

1. Under current operating policies, DOE responsibilities do not include health care for non-irradiation related pathologic conditions.

77 agreement

2. The definition of "radiation-related" pathologic conditions is not clear. There is uncertainty among radiation experts as to

the biologic effects of long-term "low-level" radiation. The status of acute and long-term effects of higher levels of radiation offers a greater consensus by the experts. In light of the possible change in ICRP maximum permissible dose for the individual, the size of the study group may change in the future.

3. The dosimetry of the islands involved in the March 1, 1954 accident is uncertain. It has been restudied and revised repeatedly as new technology and new data become available. Under the circumstances, only population dosimetry is possible. It would appear from the pathologic results, at least to the thyroids of some of the children of Rongelap, that the individual variations might be considerably higher than was previously estimated (private communication with J. E. Rall, M.D., Director of the Institute of Metabolic and Allied Diseases, National Institutes of Health).

4. Irrespective of the calculated doses to the exposed population, the development of radiation-related disease for which the DOE/BNL/DOI has accepted moral and fiscal responsibility has fixed in the minds of the Marshallese the fact that they and their land have been "poisoned" (synonymous with the Marshallese word for radiation). This intellectual, psychological, and emotional set is deep-rooted and probably cannot be erased.

NOT CORRECT.

5. The Marshallese consider themselves a "unique" subpopulation of Micronesia. Their documented "injury" by the U.S., supported by anti-nuclear world opinion, gives them great political

WHY IN QUOTES ?

and economic leverage. Their recent movement for "free association" will probably not progress to independence, without firm guarantees, in writing, by the United States, that we will continue to compensate the people for injury and damage to their land. Their current concept includes the descendants of those people who have been identified as "injured" through property and/or physical loss.

6. Conversely, the U.S. would like to resolve these claims equitably and to place some reasonable time limit on U.S. liability.

7. The current Trust Territory health care delivery "system" is totally inadequate to serve as the primary care referral base for the BNL team. The reasons for this include:

   a) very poor administration (fiscal, personnel, planning, etc.);

   b) poor liaison with their source of funds, i.e., Trust Territory;

   c) under-trained professionals;

   d) heavy patient load (high incidence of a wide spectrum of diseases).

   e) very poor facilities and upkeep.

8. The current "power base" in the Marshall Islands lies in the hereditary leaders and their appointed followers. They have assimilated themselves into the modern (free association) government and exert considerable influence over the territory. They have vested interest in protecting their own wealth and positions and the people have little voice in the actual process of "self-determination". These leaders are the people with whom we must deal to resolve our problems, but we must understand their orientation and goals. One of these followers recently

IS NOT THE BASIC PROBLEM TOTALLY INADEQUATE FUNDING ?

NO

OUT OF BOUNDS

advised his constituents to refuse U.S. compensation payments because he interpreted the payments to be a final settlement for all future claims. We feel the leaders realize the possibility of the potential closing or significant reduction in the government investment in Kwajalein, which is their major financial base. Therefore, they will probably demand continued reparations for their land and people.

9. Due to the wide dispersion of the islands (atolls) and people, transportation for the medical team, as well as for the economy, becomes of primary importance. Little is being done to solve this problem.

10. Communications among the widely-scattered islands is non-existent or poor at best. This results in a fractionation of the people, poor flow of information, reliance on rumor, and little or no health care in emergency situations. The solutions to these problems are technologically very simple and relatively inexpensive. Yet somehow they have not been implemented.

BY WHOSE STANDARD

11. High volume screening of patients for specific data has become a highly-specialized area. Improvements can be made in screening facilities and methodologies, and these are outlined.

12. The recent repatriation of the people of Bikini, who were noted to be accumulating an increased body burden of $^{137}$Cesium,

has compromised, in the eyes of the Marshallese, the safety of living on "contaminated" islands. They ignore or reject the concept of "relative risk" based upon carefully-calculated background and ecologic measurements of radiation. The same reasoning will probably apply to the people on Eniwetok and Ujelang.

WHAT SAME REASONING ?

13. Personnel ceilings, currently in effect at BNL, prohibit any significant expansion of the program, e.g., the addition of the people of Bikini and Eniwetok (please see Option C - IV Analysis-How - p. 13).

These constraints are put into context and dissected, in detail, in the following four flow sheets where the significance of their impact on the objectives can be related to the various approaches open to us. The flow sheets are detachable so that they can be placed in vertical sequence for comparison of each facet under each option.

## VI. Trade-off or Synthesis

We realize that options A and B would in fact, represent a reduction in the level of health care delivery currently available. A review of the most recent "189" for FY'79 and '80 reveals that in February 1977, DOE agreed "to assist the TT in an expanded health care program for the people living at Rongelap and Utirik. This included complete medical and laboratory examinations of ...all Marshallese living on these atolls." The problems inherent in that agreement were the inability of the TT to follow-up on the diseases discovered in this expanded screening. The BNL field team has limited resources to adequately diagnose and treat primary medical problems. As a result of intensified screening, a large number of "abnormal" findings have been identified.

OPTION A

detection and treatment of radiation related pathology in exposed and control populations

*Note: Numbers under constraints refer to common constraints, text p. 5-4

I. Establish the ideal objectives

1. Screening:
What pathologic findings are sought?
(A) Thyroid → Hypofunction and/or neoplasia - adenoma or carcinoma (B) Breast CA (C) Skin CA (D) Hematologic-leukemia, myelofibrosis, aplastic anemia, (E) GI tract CA (F) Genetic abnormalities (sample size too small to establish a cause → effect relationship to genetic abnormalities) (per Dr. J. Neel).

2. Treatment:
(A) Short-term whatever treatment is indicated to stabilize the patient until he can be safely transported to a designated tertiary care center for definitive therapy.
(B) Long-term therapy directed towards the pathologic condition(s) found at screening or by tertiary care.

3. Follow up:
(A) Short-term periodic re-evaluation of any detected abnormalities to determine their status, e.g., progression vs remission.
(B) Long-term: fixed protocol to follow tertiary/post operative cases for the rest of their lives.

II. Constraints

Present levels of care
Screening: (1)(7)(9)(10)(11)*
Treatment: (4) - BNL currently treats radiation induced problems at BNL and Cleveland with good results.
Follow-up: (2)(4)(8)(9)(10)(11)(12)*
Our resident MD can easily follow up the treated cases but not general primary care.

Existing Policy
(1)(4)(5)(6)(7)(8)(9)(10)* A common point of contact does not exist for all of the agencies effecting or effected by the BNL medical program.

Existing needs and demands
(4)(5)(6)(7)(8)(9)(10)(11)* No unique constraints for Option A.

Projected needs and demands
(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)* - Option A offers the minimum needs and demands but will not meet the Marshallese expectations.

Planning at other levels
(1)(2)(3)(5)(6)(7)(8)* - The lack of coordination/liaison among the many laboratories and governmental agencies involved in the care of the Marshallese has resulted in conflicting information from some concerned U.S. officials. The resulting confusion has placed the U.S. in a vulnerable position - ? credibility

Existing Facilities
(7)(8)(9)(10)(11)* - The lack of a viable primary referral system is almost an absolute constraint.

Financial
(1)(5)(6)(7)(8)* - option A will require the lowest operating budget, initially. However, the costs of litigation brought by the Marshallese for compensation could result in significant increase in U.S. payments.

Manpower - (1)(3)(4)(5)(7)(11)* - Option A offers lowest requirements. However, a cutback in the level of care provided will provoke lack of cooperation by the Marshallese resulting in poor cooperation, compliance → wasted time, poor data.

Timing - (2)(3)(4)(7)* - Marshallese claim injury due to long-term exposure to "low level" radiation. Recent U.S. "low level" studies and fear of long term effects has strengthened Marshallese position. Bikini episode - media.

Demographic Population Characteristics (4)(7)(8)(9)(10)* - The culture prohibits direct expression of hostility toward another. A mediator must be used. U.S. efforts to clarify grievances unsuccessful to date.

III. Translation

Reinstatement of refined objectives in consideration of restraints.

The relative constraints would not materially change the basic objectives of Option A. An additional objective has been generated by the identification of a lack of coordination among the various agencies and labs involved in the total care of the Marshallese

An additional objective would be to establish a single contact point in DOE to coordinate all these programs and to establish close liaison with DOE & DOI. In addition, since the logistics, e.g., transportation is a common problem to all users, there should be at least one annual users meeting with additional meetings as necessary.

IV. Analysis

Develop possible approaches to attaining the objectives, with each approach being stated in terms of:

What: Screening(primary detection), Treatment-short-term, Follow-up, short & long-term, Single contact point for efficient coordination of above.

Who: BNL medical team has 25 years of experience in Option A for screening, treatment and follow-up. DOE best suited to identify single contact point.

Where: Screening of exposed and control populations wherever we can locate them.

When: Timing should be based upon the best available knowledge regarding the time interval for the detection of radiation abnormalities.

How: The BNL medical team is currently doing considerably more than studying radiation related pathology. A well-planned, high intensity educational program would be necessary to explain why the medical program was being reduced at this time. The movement to "free association" will probably compromise the already inadequate health care funding by the Trust Territory.

Timing
The timing of the BNL field surveys is of great importance for the following reasons: 1) Long lead time must be included to insure proper notification of the study group - (especially on the outer islands - we must always keep in mind the poor communications); 2) Long lead time and a fixed schedule will do much to counter the charges that BNL has planned its trips to the outer islands to coincide with the absence of many of the leaders; 3) Evenly spaced visits, about 2½ months apart will assist the BNL field staff in the follow-up of the pathologic condition: i.e., a relatively fixed time base line

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III. Translation

Reinstatement of refined objectives in consideration of restraints.

The relative constraints would not materially change the basic objectives of Option A. An additional objective has been generated by the identification of a lack of coordination among the various agencies and labs involved in the total care of the Marshallese

An additional objective would be to establish a single contact point in DOE to coordinate all these programs and to establish close liaison with DOE & DOI. In addition, since the logistics, e.g., transportation is a common problem to all users, there should be at least one annual users meeting with additional meetings as necessary.

IV. Analysis

Develop possible approaches to attaining the objectives, with each approach being stated in terms of:

What: Screening(primary detection), Treatment-short-term, Follow-up, short & long-term, Single contact point for efficient coordination of above.

Who: BNL medical team has 25 years of experience in Option A for screening, treatment and follow-up. DOE best suited to identify single contact point.

Where: Screening of exposed and control populations wherever we can locate them.

When: Timing should be based upon the best available knowledge regarding the time interval for the detection of radiation abnormalities.

How: The BNL medical team is currently doing considerably more than studying radiation related pathology. A well-planned, high intensity educational program would be necessary to explain why the medical program was being reduced at this time. The movement to "free association" will probably compromise the already inadequate health care funding by the Trust Territory.

Timing:

The timing of the BNL field surveys is of great importance for the following reasons: 1) Long lead time must be included to insure proper notification of the study group - (especially on the outer islands - we must always keep in mind the poor communications); 2) Long lead time and a fixed schedule will do much to counter the charges that BNL has planned its trips to the outer islands to coincide with the absence of many of the leaders; 3) Evenly spaced visits, about 2½ months apart will assist the BNL field staff in the follow-up of the pathologic condition: i.e., a relatively fixed time base line

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V. Selection Criteria

Set forth the criteria for the selection of an approach:

Performance or results

A detailed research protocol will be developed to specify the medical criteria and algorithms for the detection of radiation related pathologic conditions (e.g; disease specific items in the history, physical exam and laboratory profile to detect the earliest deviation from "normal function" → TSH (to document thyroid hypofunction.) Each identified pathologic condition (listed under objectives) will be screened by the appropriate methodologies. Treatment and follow-up will be assured by appropriate algorithms and check lists.

Total cost(s)

The total cost will be very close to our 1978 expenditures. The reduction in the patient population will be offset by the cost of the educational program to explain the reason for our cut-back in services and by inflation.

Flexibility

This option offers us little flexibility. The pathologic conditions related to radiation exposure in the range determined for the Marshall Islands is rather limited. Our program under this option would be constrained to this limited area.

Avoidance of untoward consequences

With strictly limited goals the probability of obtaining valid data and early detection of disease is enhanced by concentration of funds on limited objectives - i.e., minimum dilution of effort. However, the public outcry against the reduction in the program could have serious political/sociologic consequences.

Risk

The risks to DOE/BNL are: The public reaction to reduced medical care. We are unable to quantify the risks to the program offered by this option but they would probably include: lack of patient cooperation (resulting in ? data), vigorous public protest (locally and internationally) and a vigorous program for DOE/BNL to, at least, return to the previous level of care. Risks to the Marshallese are: 1) Failure to detect other than radiation related diseases - with increased morbidity and mortality among the exposed & control groups. 2) Possible alienation of the Marshallese by DOE/BNL resulting in a breakdown in vital communication.

Cost/effectiveness - No data format now exists to compute cost/effectiveness or cost/benefit. The diffuse funding mechanisms make it very difficult for the principal investigator to obtain an accurate current accounting of monies expended on the medical progr If such data were available and all screening, treatment and follow-up goals clearly defined, some rough estimation of cost/patient ... be derived

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OPTION B

...e detection and treatment of radiation-related diseases plus the care ...d follow-up of patients in the Exposed and Control Groups found to have non-radiation related diseases

| I. Establish the ideal objectives. | II Constraints | III. Translation | IV. Analysis | V. Selecti |
|---|---|---|---|---|
| A. Screening for radiation-related pathologic conditions as in Option A - plus additional screening for age and sex correlated high risk diseases.<br><br>B. Treatment as in Option A for radiation-related diseases. For all other diseases change "tertiary" care center to primary or secondary care center, as available.<br><br>C. Follow-up (as in Option A) - Change tertiary care to primary or secondary care, as available. | Present levels of care<br>Screening: as in Option A - plus, need to develop "risk tables" (age and sex specific) to expand the screening data base. The relative improvement in recent health "statistics" should be of some assistance. Treatment: (1)(7)(9)(10)(11) plus increased logistic requirements of added care. Follow-up: As in Option A - plus increased logistic and manpower required for care.<br><br>Existing Policy<br>As in Option A - plus current operating procedures already includes this added group and others.<br><br>Existing needs and demands<br>As in Option A - The need for better primary care is evident to many Marshallese. They are currently and have historically, demanded better care.<br><br>Projected needs and demands<br>As in Option A - plus an ever increasing base population - crude growth rate 3% - better primary medical care will probably reduce mortality resulting in increasing population. Many Marshall se are asking for birth control education.<br><br>Planning at other levels<br>As in Option A - Plus significant decrease in already meager T.T. support of medical care due to vote for "free association".<br><br>Existing Facilities<br>As in Option A - plus the increased load of further patient care would strain the existing facilities resulting in severely diminishing returns for each health dollar (below minimum "critical Mass" | Restatement of refined objectives in consideration of restraints.<br><br>As in Option A - The increased patient care demanded by Option B will require a slight increase in manpower and logistics (funding). Since the increase is directly related to primary patient care and is, therefore, not DOE's responsibility, perhaps some inter-agency agreement with DOI could be reached to provide this supplement. In addition, if, under the "free association" agreement the DOD-Kwajalein taxes are to paid directly to the Marshall Islands, some fixed portion might be diverted to primary medical care under a DOD/Kwaj-Marshall Island Government agreement. | Develop possible approaches to attaining the objectives, with each approach being stated in terms of:<br><br>What: As in Option A - plus selected "risk hazard appraisal" screening, care and follow-up.<br><br>Who: As in Option A - BNL is currently exceeding Option B in its active commitment.<br><br>Where: Screening, care and follow-up of exposed and control groups wherever we can locate them.<br><br>When: As in Option A - plus regular intermittent visits (every 2½ months) for follow-up of non-radiation related problems (already being done).<br><br>How: We would, actually, nee to cut back on our present commitments to comply with Option B, e.g., we have already put almost all of the people formerly on Bikini through th entire screening procedure. | Set forth the cri<br><br>Performance or re<br>As in Option A to be expanded to not currently ass will be used to d findings would be diseases (age and atherosclerosis i young and old mal<br><br>Total Cost<br>As in Option A (explaining the c discussed in the that this option<br><br>Flexibility<br>There is increa stationed at Ebey in fact, it would<br><br>Avoidance of unto<br>The added flexi shaky credibility The critical poir credibility gap frequently and by as soon as it is<br><br>Risk<br>The risks to D( effort is below (publicity, coop( The risks to t disease will be<br><br>Cost/effectivene<br>As in Option A<br><br>Timing<br>As in Option A existing schedul |

Financial: (1)(5)(6)(7)(8) The added screening costs will be a small increment in the existing screening program. The added primary and secondary care and follow-up - both short/long term may be a significant amount (dependent upon the diseases selected and their prevlance). (See facilities cos as well).

Manpower: (13) As in Option A - but better cooperation will hopefully improve compliar (and quality of data). The increased screening requirements can be handled by better utilization of manpower, adding one Physician Asst. or nurse practitioner.

Timing: As in Option A - However, increased coverage should raise credibility of DOE/I This option is still below current operating procedures!

Demographic Population Characteristics: As in Option A - but with a reduction in cove hostility + increased cooperation. Population under care, still below current operating policies.

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## III. Translation

Restatement of refined objectives in consideration of restraints.

As in Option A - The increased patient care demanded by Option B will require a slight increase in manpower and logistics (funding). Since the increase is directly related to primary patient care and is, therefore, not DOE's responsibility, perhaps some inter-agency agreement with DOI could be reached to provide this supplement. In addition, if, under the "free association" agreement the DOD-Kwajalein taxes are to paid directly to the Marshall Islands, some fixed portion might be diverted to primary medical care under a DOD/Kwaj-Marshall Islend Government agreement.

## IV. Analysis

Develop possible approaches to attaining the objectives, with each approach being stated in terms of:

What: As in Option A - plus selected "risk hazard appraisal" screening, care and follow-up.

Who: As in Option A - BNL is currently exceeding Option B in its active commitment.

Where: Screening, care and follow-up of exposed and control groups wherever we can locate them.

When: As in Option A - plus regular intermittent visits (every 2½ months) for follow-up of non-radiation related problems (already being done).

How: We would, actually, need to cut back on our present commitments to comply with Option B, e.g., we have already put almost all of the people formerly on Bikini through the entire screening procedure.

## V. Selection Criteria

Set forth the criteria for the selection of an approach:

Performance or results

As in Option A - However, the section on radiation related diseases will need to be expanded to include those age and sex specific general medical problems not currently associated with radiation. The methodology of Robbins and Hall will be used to determine what specific historical, physical, and laboratory findings would be most sensitive and specific to detect the most prevalent diseases (age and sex-determined, e.g., we will not look for coronary atherosclerosis in young females, evidence for alcoholism will be sought in young and old males, etc.).

Total Cost

As in Option A -but we can cancel out the specific education program (explaining the cut in services). The various cost trade-offs have been discussed in the previous sections of this option. We must keep in mind that this option is still below our present commitment.

Flexibility

There is increased flexibility with this option. We feel the BNL team stationed at Ebeye could handle this additional load without problems - in fact, it would enrich their practice and provide some welcome variety.

Avoidance of untoward consequences

The added flexibility and commitment of the DOE/BNL team should enhance our shaky credibility and generate true gratitude among some of the Marshallese. The critical point is never to promise more than you can deliver. The credibility gap may be partially patched by saying "I don't know" more frequently and by forwarding all pertinent data on to interested Marshallese as soon as it is available.

Risk

The risks to DOE/BNL are less than with Option A - However, this level of effort is below the current program and will cause some adverse reaction (publicity, cooperation, etc.).

The risks to the Marshallese are that a great deal of potentially treatable disease will be excluded from our attention by this option.

Cost/effectiveness

As in Option A

Timing

As in Option A - The increased population would not appreciably change our existing schedule.



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All radiation related diseases in the exposed and control groups on Rongelap and Utirik plus all low level radiation exposed patients who have already gone through full screening - irrespective of findings of disease

| I. Establish the broad objectives | II. Constraints | III. Translations | IV. Analysis | V. Selection Criteria |
|---|---|---|---|---|
| As in Options A and B but adding all patients, exposed to low level radiation, who have already gone through the BNL screening procedures. This represents the current level of operation. In the future, the screening will be modified as detailed for the "directed data base - risk hazard appraisal" approach of Robbins and Hall. | **Present levels of care**<br>As in Options A and B.<br><br>**Existing Policy**<br>As in Options A and B. This option reflects existing de facto field policy.<br><br>**Existing needs and demands**<br>As in Option A and B. Adding a portion of the Bikini population will probably not fulfill the Marshallese demands or needs.<br><br>**Projected needs and demands**<br>As in Option A and B. It seems probable that we will be unable to separate, for medical purposes, the Bikini people who returned to Bikini from the remainder on Kili. The Eniwetok people will probably also demand equal treatment.<br><br>**Planning at other levels**<br>As in Option A and B. Powerful U.S. congressional groups (Yates Committee - on appropriations, etc.) are interested in and investigating the well-being of the Marshallese.<br><br>**Existing facilities**<br>As in Option A and B. A re-design and construction of a flexible, mobile screening and treatment support facility - would in the long run increase efficiency and reduce cost/patient.<br><br>**Financial**<br>As in option A and B. The significant variable will be the (?) addition of the people of Bikini and Eniwetok.<br><br>**Manpower**<br>As in Option A and B. Again the addition of Bikini and Eniwetok would more than double the outpatient load. However, the staff could probably handle the increased load with the addition of a Physician Assistant and a nurse practitioner.<br><br>**Timing**<br>As in Option A and B. No further constraints (optimum timing).<br><br>**Demographic Population Characteristics**<br>As in Option A & B. Plus all patients (exposed to low level radiation) not already screened. Adding Bikini (450) + Eniwetok (450). | Restatement of refined objectives in consideration of restraints.<br><br>As in Options A and B - Since this is our present level of operation with existing funds - no significant translation of objectives is needed. | Develop possible approaches to attaining the objectives, with each approach being stated in terms of:<br><br>**What:** As in Options A and B.<br><br>**Who:** As in Options A and B. - plus all patients, exposed to low level radiation who have already gone through BNL screening procedure - again status of Bikini and Eniwetok will change requirements.<br><br>**Where:** As in Options A and B - plus Kili, Jaluit, ? Eniwetok ? Ujelang.<br><br>**When:** As in Options A and B.<br><br>**How:** If the patient load is doubled and increased, primary care is expected. There will need to be approximately a doubling of the operating budget with a 66% increase in personnel and a ship assigned specifically to the medical program. It would be prudent to separate the identify of the Bikini-Eniwetok group from BNL - We could retain administrative control and function as advisors, but a subcontractor might alleviate some of the anxiety of the new study group that would arise from the "radiation" oriented BNL group. We would suggest the University of Hawaii as the most suitable and interested party. Funding for this increase in primary care might be obtained by pass-through funding from DOI. | Set forth the criteria for the selec<br><br>**Performance or results**<br>As in Options A and B.<br><br>**Total cost**<br>As in Options A and B. See columr - **How:** for discussion of costs.<br><br>**Flexibility**<br>As in Options A and B - Increasing larger responsibility for care and l and manpower) - permits better sched<br><br>**Avoidance of untoward consequences**<br>As in Options A and B - plus added comprehensive care.<br><br>**Risk**<br>As in Options A and B - With incre patient care the possibility of subc performance may increase - ? Ov can be offset by adequate plannin support - Expanded operations with should not be attempted.<br><br>**Cost/effectiveness**<br>As in Options A and B.<br><br>**Timing**<br>As in Options A and B. This is t of the political and sociologic situ to enlarge the program and to make a change the image of the study. |

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| III. Translations | IV. Analysis | V. Selection Criteria |
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| Restatement of refined objectives in consideration of restraints. | Develop possible approaches to attaining the objectives, with each approach being stated in terms of: | Set forth the criteria for the selection of an approach: |
| As in Options A and B - Since this is our present level of operation with existing funds - no significant translation of objectives is needed. | **What:** As in Options A and B.<br><br>**Who:** As in Options A and B. - plus all patients, exposed to low level radiation who have already gone through BNL screening procedure - again status of Bikini and Eniwetok will change requirements.<br><br>**Where:** As in Options A and B - plus Kili, Jaluit, ? Eniwetok ? Ujelang.<br><br>**When:** As in Options A and B.<br><br>**How:** If the patient load is doubled and increased, primary care is expected. There will need to be approximately a doubling of the operating budget with a 66% increase in personnel and a ship assigned specifically to the medical program. It would be prudent to separate the identify of the Bikini-Eniwetok group from BNL - We could retain administrative control and function as advisors, but a subcontractor might alleviate some of the anxiety of the new study group that would arise from the "radiation" oriented BNL group. We would suggest the University of Hawaii as the most suitable and interested party. Funding for this increase in primary care might be obtained by pass-through funding from DOI. | **Performance or results**<br>As in Options A and B.<br><br>**Total cost**<br>As in Options A and B. See column IV.<br>- **How:** for discussion of costs.<br><br>**Flexibility**<br>As in Options A and B - Increasing flexibility due to larger responsibility for care and better support (logistic and manpower) - permits better scheduling.<br><br>**Avoidance of untoward consequences**<br>As in Options A and B - plus added credit for more comprehensive care.<br><br>**Risk**<br>As in Options A and B - With increasing volume of patient care the possibility of suboptimal or poor performance may increase - ? Over commitment - this can be offset by adequate planning and logistic support - Expanded operations without these elements should not be attempted.<br><br>**Cost/effectiveness**<br>As in Options A and B.<br><br>**Timing**<br>As in Options A and B. This is the optimum time, in light of the political and sociologic situation in the Marshalls to enlarge the program and to make a positive effort to change the image of the study. |

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OPTION D

All radiation related diseases in the exposed and control populations plus full screening of all inhabitants now living (or scheduled to be repatriated to) Marshall Islands contaminated by atomic fallout

## I. Establish the broad objectives

As in Options A, B and C but with added emphasis on early detection and treatment of all significant diseases. This option offers unequivocable evidence of the true concern of the U.S. for the comprehensive health care of the peoples of the islands contaminated by the testing program.

In addition, such a program would allow us to develop a much more significant "health profile" of the Marshallese to assist in the determination of potential radiation related pathological conditions.

## II. Constraints

Present levels of care
As in Options A, B and C - This option exceeds the mandates of our present program and would be impossible without an appreciable increase in funding.

Existing Policy
As in Options A, B and C - In addition, in light of the recent (Oct. 12, 1978) DOE/DOI/DOD meeting on the status of the peoples of Eniwetok and Bikini, it appears that this option is the one favored by the Under Secretary of the Interior, Mr. Joseph.

Existing needs and demands
This option most closely meets the needs and demands of the Marshallese people and their leaders.

Projected needs and demands
Since this option provides adequate health care for all currently and potentially involved Marshallese, it should meet all projected needs and demands

Planning at other levels
As in Options A, B and C

Existing facilities
As in Options A, B and C - A major expansion of existing facilities would be necessary to support a medical program more than twice the present effort.

Financial
A cost study would need to be instituted as soon as possible to determine the current and future costs of such a program (please see section V Selection Criteria) - under "Total Costs".

Manpower (13)
As in Options A, B and C. - Please see Section IV Analysis of "How" for manpower requirements.

Timing
The time is now optimum for DOE in light of DOI and Marshallese statements of needs.

Demographic Population Characteristics
As in Options A, B and C - The ar[illegible] covered will be much more than double [illegible] by this option - [illegible]

## III. Translation

Restatement of refined objectives in consideration of restraints.

As in Options A, B and C, the restatement of objectives will be dependent upon:

1. The definitions of the role (moral/fiscal) of the administrators of DOI and DOE to carry through on the statements of principal made at the Oct. 12, 1978 - DOI/DOE/DOD meeting in Washington, D.C. concerning the status of the peoples of Bikini and Eniwetok.
2. If full health care responsibility is assumed - Option D needs no restatement.
3. If limited health care responsibility is the choice - some compromise between Options C and D is indicated.

## IV. Analysis

Develop possible approaches to attaining the objectives, with each approach being stated in terms of:

What: Full directed data base, screening and follow-up of pertinent findings in population defined under "Objectives"

Who: With the expansion of the patient population, it would be wise to set up (2) field medical teams; (A) the BNL-acute exposure study team (covering peoples of Rongelap - Utirik) and (B) the "low level" study group - under contract - both supported by adequate-$1^{o}$ -$2^{o}$ care at Ebeye and Majuro.

Where: As in Option C.

When: As in Options A, B and C.

How: As in Option C - plus added manpower to support 2 field teams plus at least 2 U.S. trained physicians at Majuro and Ebeye - supported by para-medical personnel, Physician Assistants and nurse practitioners.

## V. Selection Criteri

Set forth the criteria fo

Performance or results
Research based upo[illegible] a [illegible] system will provide optim[illegible] population of the Marshal[illegible] of these only about 2,00[illegible] Option D. The remaining [illegible] the general improvement [illegible] primary centers, - but t[illegible] the medical staff - work [illegible] medical officers and the

Total cost
Really impossible to d[illegible] However, based upon our [illegible] C) with a cumulative bud[illegible] to Option D should cost [illegible]

Flexibility
This option gives us t[illegible] examinations in the fiel[illegible] medical and transportati[illegible]

Avoidance of untoward co[illegible]
This option offers the[illegible] ment to the people. Thi[illegible] image of U.S. in all of [illegible] In addition, with the ne[illegible] might decide to fill the[illegible] physicians (with the goo[illegible] nuclear MD's might becom[illegible]

Risk
Least risk of all opti[illegible] then not honored.

Cost/effectiveness
As in Options A,B and [illegible]

Timing
This is the optimum ti[illegible] reasons: A) The moveme[illegible] the Marshall Islands in [illegible] the health care delivery[illegible] in this period of gener[illegible] of Bikini and Eniwetok [illegible] to their very legitimat[illegible]


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| III. Translation | IV. Analysis | V. Selection Criteria |
|---|---|---|
| Restatement of refined objectives in consideration of restraints. | Develop possible approaches to attaining the objectives, with each approach being stated in terms of: | Set forth the criteria for the selection of an approach: |

As in Options A, B and C, the restatement of objectives will be dependent upon:

1. The definitions of the role (moral/fiscal) of the administrators of DOI and DOE to carry through on the statements of principal made at the Oct. 12, 1978 - DOI/DOE/DOD meeting in Washington, D.C. concerning the status of the peoples of Bikini and Eniwetok.
2. If full health care responsibility is assumed - Option D needs no restatement.
3. If limited health care responsibility is the choice - some compromise between Options C and D is indicated.

What: Full directed data base, screening and follow-up of pertinent findings in population defined under "Objectives"

Who: With the expansion of the patient population, it would be wise to set up (2) field medical teams; (A) the BNL-acute exposure study team (covering peoples of Rongelap - Utirik) and (B) the "low level" study group - under contract - both supported by adequate-1° -2° care at Ebeye and Majuro.

Where: As in Option C.

When: As in Options A, B and C.

How: As in Option C - plus added manpower to support 2 field teams plus at least 2 U.S. trained physicians at Majuro and Ebeye - supported by para-medical personnel, Physician Assistants and nurse practitioners.

Performance or results

Research based upon a sound primary - secondary care delivery system will provide optimum care for each patient. The total population of the Marshall Islands is about 22,000 people - of these only about 2,000 would be completely covered by Option D. The remaining 20,000 would benefit greatly by the general improvement in the quality of care at the primary centers, - but that would be a secondary goal of the medical staff - working with the existing Marshallese medical officers and their staffs.

Total cost

Really impossible to develop a reasonably accurate figure. However, based upon our present operating expenses (Option C) with a cumulative budget of about 1 million the expansion to Option D should cost about 1 to 1½ million extra.

Flexibility

This option gives us the greatest flexibility in scheduling examinations in the field, due to the increased on-site medical and transportation resources.

Avoidance of untoward consequences

This option offers the best proof of a sincere U.S. commitment to the people. This should help greatly in improving the image of U.S. in all of the media - U.S. as well as international. In addition, with the new "free association", the Marshallese might decide to fill the primary medical care vacuum with Japanese physicians (with the good possibility that left wing - anti-nuclear MD's might become entrenched in the Marshalls).

Risk

Least risk of all options - unless commitment was made and then not honored.

Cost/effectiveness

As in Options A,B and C.

Timing

This is the optimum time for implementing Option D - for two reasons: A) The movement toward "free association" has placed the Marshall Islands in a state of transition. The revisions in the health care delivery systems could move along most smoothly in this period of general and economic transition. B) The people of Bikini and Eniwetok are demanding quick and decisive answers to their very legitimate requests.



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These demand further study and resolution if we are to meet the basic tenets of screening: Do NOT screen unless:

1. You are prepared to follow-up and resolve false positive and false negative findings.
2. The screening process will result in some benefit for the patient.

From a moral and medicolegal standpoint, we should insure adequate follow-up and treatment of all treatable conditions. To identify disease, inform the patient of the disease and then fail to treat it, would run the risk of a serious loss of credibility for the medical team; and more importantly, a disservice to the patient. For example, if a patient is told he is hypertensive (e.g., diastolic over 105 mmHg), and is not treated, he can assume that:

1. the findings are of little importance because..."the doctors did nothing about it...";
2. the doctors don't care enough about the patients to try to treat the condition.

Either result is undesirable.

These problems in the "philosophy" of screening are not minor. They should not be ignored in planning this program. A close examination of the actual field conditions reveals that the unavailability of adequate treatment and follow-up is the critical preliminary determinant of exactly what should be done in planning the details of medical and biochemical screening for primary care. Screening for research operates under different constraints, usually protected by a committee to inform and protect the research subject (A Human Studies Review Committee). Failure to comply with either the research or primary care requisites

of screening is to invite patient dissatisfaction, litigation, loss of credibility and poor medical practice.

We have emphasized the problems inherent in "expanded" screening because the research goals of the radiation related diseases are clearly defined in the "189", but the "expanded health care program" is relatively undefined. We have attempted to define the basic "189" in Option A and the spectrum of "expanded health care programs" in options B through D.

The synthesis we are attempting to achieve is the full mandate of Option A, plus as much of Option D as is feasible under present jurisdictional and funding constraints. DOE clearly has responsibility for Options A and B and the Trust Territories (under DOI) the remainder of primary and secondary care under Options C and D. However, with the new movement to "free association" the responsibility will shift to the administration and people of the Marshall Islands. We would suggest some initial interdepartmental funding to support whichever option DOE/DOI desires until the status of the "free association" is clarified. After a responsible governing body is identified in the Marshalls a new "sharing" of primary and secondary health costs might be negotiated with the Marshalls, that would direct an adequate percentage of their budget into health care. We feel the medical administrative expertise does not currently exist in the Marshalls to implement and manage this new system and would strongly urge the interested parties to obtain the best available health care system analyst to develop realistic cost/effective short and long term plans for adequate health care with existing and expected resources.

This is the optimum time to perform this type of study and planning and the outcome will greatly influence the scope of the BNL medical effort. Serious consideration should be directed toward the utilization of existing expertise in developing health care systems for the South Pacific. The University of

Hawaii has developed well-recognized and highly-effective programs to deal with many of the basic problems confronted by the Marshall Islands. Those problems are basically a maze of anthropologic and sociologic characteristics determining the health status of the society and each individual. We feel a multidisciplinary approach to restructuring the health care system will be the most cost/effective method in the long run. The University of Hawaii has expressed an interest in discussing this concept with the BNL team. We feel a coordinated effort by BNL and the University of Hawaii, working with the existing Trust Territory medical program could achieve most of the goals of Option D. Such a program could be developed incrementally, under contract, as specific problems were identified.

ADDENDUM I
TO
DOE
POSITION PAPER ON THE
BNL MARSHALL ISLAND PROGRAM
(DATED DECEMBER 1st,1978)

Dr. Wyzen of the DOE has asked for amplification of the role of the BNL resident physician under each of the options listed in the basic position paper.

Dr. Conard and I feel the role of the resident physician under Option A (the detection and treatment of radiation-related pathology in exposed and control populations) should be outlined as follows:

1. The resident physician's (RP) primary responsibility is to function as the on-site coordinator of the BNL program. He is responsible, in addition, for the supervision of the daily follow-up and treatment of the exposed and control groups in the basic research protocol for radiation-related diseases.

Additional responsibilities under Option B: (A-plus the care and follow-up of patients in the exposed and control groups found to have non-radiation related diseases, e.g., diabetes)would include:

1. As in A - plus the medical follow-up and treatment as indicated for those specific conditions found in ancillary studies as part of the BNL field surveys, e.g., diabetes.

Additional responsibilities under Option C: (A and B - plus medical care for all low-level radiation exposed patients who have already gone through full screening - irrespective of findings of disease, e.g., people living on Bikini - April 1978) would include:

1. As in A and B - plus screening, follow-up and treatment for the 137 people examined on Bikini (April 1978).

Finally, the additional responsibilities under Option D : (A,B and C plus full screening and follow-up) of all inhabitants now living on (or scheduled to be repatriated to) Marshall islands contaminated by atomic fall-out):

1. As in A, B and C - plus the medical care, i.e., screening, follow-up, treatment and primary preventive medicine of this enlarged study group (maximum about 2000 patients).

The term "medical care" in each of these options has been purposely left undefined. The spectrum of medical care could range from a very narrow interpretation of the research mandate related solely to the detection and treatment of pathologic conditions thought to be related, with a high probability, to radiation exposure to a widely expanded concept of "medical care" covering primary prevention, $1^{o}$-$2^{o}$ care and comprehensive health care - similar to the defined role of the family practice physician, as defined by the Academy of Family Practice.