

## **SUMMARY OF MINUTES OF THE SECOND PUBLIC MEETING OF THE VETERANS' ADVISORY BOARD ON DOSE RECONSTRUCTION**

The second meeting of the Veterans' Advisory Board on Dose Reconstruction (VBDR or the Board) was held at the Sheraton Gateway Hotel Los Angeles Airport, Los Angeles, California on January 12-13, 2006.

In accordance with the provisions of the Federal Advisory Committee Act, *P.L. 92-463*, which sets forth standards for the formation and conduct of government advisory committees, the meeting was open to the public.

### **ATTENDANCE**

*Board Members Present:* Dr. James Zimble (Chairman), Dr. Paul K. Blake, Mr. Harold L. Beck, Dr. Ronald R. Blanck, Dr. John D. Boice, Mr. Kenneth L. Groves, Dr. David E. McCurdy, Dr. John Lathrop, Mr. Thomas J. Pamperin, Dr. Curt R. Reimann, Dr. Kristin Swenson, Mr. George Edwin Taylor, Dr. Elaine Vaughan (via telephone), Mr. Paul G. Voillequé, and Dr. Gary H. Zeman.

*Board Members Absent:* None

*Quorum present:* Yes.

### **OPENING REMARKS**

**Dr. Zimble** (Chairman) called the meeting to order and welcomed everyone to the second meeting of the Board. He mentioned that the Board has been established under *P.L. 108-183*, enacted on December 16, 2003, to provide guidance and independent oversight of the dose reconstruction and claims compensation programs for veterans who participated in US-sponsored atmospheric nuclear weapons tests from 1945-1962; veterans of the 1945-1946 occupation of Hiroshima and Nagasaki, Japan; and veterans who were prisoners of war in those regions when the atomic bombs were detonated.

**Mr. William R. Faircloth** (DFO) added his welcome and explained his role as Designated Federal Officer.

### **SUMMARY OF SECOND PUBLIC MEETING OF THE BOARD**

The primary topics of the two-day VBDR meeting included briefings on the Interactive Radio-Epidemiological Program (IREP) by **Dr. Charles E. Land**, and the National Research Council's report on *Assessment of the Scientific Information for the Radiation Exposure Screening and Education Program* by **Dr. R. Julian Preston**. Also included were presentations on the current status and activities of the Nuclear Test Personnel Review (NTPR) dose reconstruction program for veterans by **Dr. Paul Blake**, and the Department of Veterans Affairs' (VA) Compensation and Pension Quality Review Program by **Mr. Thomas Pamperin**. In addition, the activities and accomplishments of

the four VBDR subcommittees (Dose Reconstruction, VA Claims, Quality Management, and Communications and Outreach) were presented.

During the meeting, veterans gave public testimony on cancers and other debilitating illnesses they believe resulted from their participation in atmospheric nuclear testing and other occupational radiation exposures. They also spoke at length about their frustration with the time it takes to adjudicate the claim for service connected, radiation-induced illnesses while others expressed dissatisfaction with DTRA dose reconstruction procedures and claims decisions made by the VA.

Verbatim transcripts of each presentation, session, and public comment are available on the VBDR Web site at <http://vbdr.org>.

## **SUMMARY OF PRESENTATIONS TO VBDR**

### ***Dr. Charles Land's presentation:***

IREP provides a scientific basis for adjudicating claims of radiation-related cancer incidence, and is now legally mandated for use in claims against the government or its contractors associated with occupational exposure.

The National Institutes of Health (NIH) epidemiological tables as mandated by Congress were not very popular in court; however the VA saw them as a tool in adjudicating claims based on service-related exposure.

IREP is a computer code that is being used to estimate the probability of causation (PC) for almost every cancer type, based on organ doses from each kind of radiation and exposure rate, and accounting for gender, age at exposure, age at diagnosis, and other risk factors such as smoking history.

The most important component parts are the radiation dose and the excess relative risk (ERR). ERR is used because it easily translates into assigned share (AS) or PC.

The problem of using estimates based on other exposed populations is transferring them to a U.S. population. There is also the problem of transferring the risks from exposure at high doses to much lower doses that would be more typical of population exposures.

The 2003 National Cancer Institute (NCI) and Centers for Disease Control and Prevention (CDC) report was requested by the VA because the law requires the NIH epidemiological tables be updated as new information becomes available. The tables were updated using more recent epidemiological dose-response data.

The reports issued by the National Academy of Sciences' Committee on Biological Effects of Ionizing Radiation (BEIR) are considered to be the most authoritative in the United States, and were used to generate the tables. The calculations contained in that report are

based on atomic-bomb survivor cancer incidence data. He went on to say that BEIR VII, as well as similar reports produced by the United Nations, are based on the same data.

BEIR VII will be the most authoritative review of mainstream science on radiation-related risk. It takes all the data from more than 50 years of the atomic-bomb survivor tumor registry, as well as data from other populations, and applies it to later times. He anticipates IREP will be improved when it adopts the models and risk estimates of BEIR VII.

***Dr. Julian Preston's presentation:***

The National Academy of Sciences (NAS) report involved a broad range of expertise in areas of ethics, radiation physics, radiation biology, epidemiology, medical screening and education. His briefing would cover only how the committee established the approach for compensation.

The NAS committee's job was to see whether the scientific information developed over the years would affect the risk estimates, and to evaluate the criteria used in the Radiation Exposure Compensation Act (RECA) program. He also pointed out that part of the committee's task was:

1. To make recommendations to Health Resources and Services Administration (HRSA) that are based on scientific knowledge and principles.
2. To determine whether other classes of individuals or additional geographic areas should be covered under the RECA program.

The RECA population includes uranium miners, uranium millers, ore transporters, downwinders, and onsite test participants. He presented a map outlining the areas of the United States covered by RECA and emphasized that areas covered by RECA were largely determined by geography and not scientific criteria.

He presented the list of specific diseases specified by RECA and pointed out that part of the committee's task was to determine if this was the appropriate set of diseases to consider.

Dr. Preston outlined the methodology used in the report. From the data gathered using geographical criterion, it was determined that on a scientific basis and dosimetric considerations there is a need to reconsider the compensation program. The committee also recognized that dosage alone would not satisfy the scientific determination for compensation eligibility.

Dr. Preston discussed the need to use a risk-based approach to determining compensation. Its essential goal is to determine the probability that a particular tumor was caused by radiation rather than other agents, lifestyle, or genetics.

A significant issue is the choice of a value of AS or PC that is accepted as "proof" that radiation is responsible for the cancer in any individual. That is the starting point. A PC of 0.5 says that there is a 50% chance the cancer was caused by radiation. However, when

considering all the other factors in risk estimation, there is a large degree of uncertainty that must be factored into the model.

Dose is a major factor in determining ERR, but for some individuals there was no way to determine dose. Therefore, it was necessary to go to previous studies, such as the NCI 1997 iodine-131 study, to obtain pertinent data. He outlined the data found in the NCI study and emphasized that the more variables one can include in determining the PC the more this tends to reduce the number of individuals who might be compensatable.

While the IREP has not been updated, it is clear that it should be. Each new study on radiation-exposed populations should be considered in the update of a risk-related compensation program.

The implementation of IREP has met some of the needs for a compensation program, but who is working on improving the system? The IREP and its modifications are used throughout government agencies, so there is a sense that the committee has proposed something that is relevant to the needs of this Board.

***Dr. Paul Blake's presentation:***

Dr. Blake provided an update on the NTPR program at the Defense Threat Reduction Agency (DTRA).

The 2003 NAS report, *The Green Book*, resulted in a revision to the procedures in the NTPR program. No dose reconstructions were performed for approximately six months following the report. Further, the VA returned a number of dose reconstructions for rework.

Cases with presumptive diagnoses can be turned around very quickly. The VA also comes to DTRA for cancers that are listed as presumptive. They, too, are handled rather quickly. The real challenge is in supporting VA cases that are non-presumptive and require a dose reconstruction.

When the cases came in for rework it contributed to a significant backlog. There are primarily two types of cancer that require dose reconstruction: skin and prostate cancer.

An analysis of the prostate dose rework shows that in no case was there a significant change to the estimated prostate dose in the 78 cases reworked. They report a dose within the 95% upper bound, per the Code of Federal Regulations. It appears that none of the 78 cases resulted in the veteran receiving compensation.

The cost of doing a dose reconstruction is approximately \$9,000, and there are 128 prostate rework cases in the backlog. Experience indicates the veteran is probably not going to meet VA requirements for compensation, so the value of the reworks is dubious. Consequently, it is recommended to discontinue dose reconstruction on prostate rework cancers.

NTPR will review the 128 remaining cases looking for unusual circumstances, and will generate correspondence to the VA, with a copy to the veteran, that DTRA stands by its previous prostate dose estimate.

Skin cancer is the only radiogenic disease reviewed that depends on skin color. The outcome of the rework indicates that approximately 11% of basal cell carcinomas, 3% of squamous cell carcinomas and zero percent of the melanomas would receive compensation. Based on that presentation, he recommended continuing with the skin dose rework cases, at this time.

Moving to quality assurance, the Policy and Guidance Manual has been modified to ensure consistency regarding radiation dose assessment. This supports bringing in more assessment teams with the hope that this will reduce the backlog.

On the topic of veteran communication activity, these are the NTPR 2005 accomplishments:

1. 3,741 phone calls to veterans made by the NTPR Program Communications and Outreach Team.
2. NTPR Case Manager conducted more than 1,100 veteran contact calls.
3. Finalized more than 500 individual's Scenario of Participation and Radiation Exposures (SPAREs).
4. Compiled feedback from veterans.

In discussing the road ahead, the number one priority is serving the veterans. At the next VBDR meeting, he will report on the status of DoD action items.

***Mr. Thomas Pamperin's presentation:***

Mr. Pamperin covered the general quality assurance program of the VA. Specific quality assurance measures concerning ionizing radiation were covered at the end of his presentation.

VA's quality assurance program is multi-dimensional and is covered in manual M 21-1. Mr. Pamperin's office also provides guidance to regional offices. Quality review consists of individual office performance and national accuracy. Supervisors and other qualified individuals conduct individual performance reviews at the regional offices. At the national level, the central office in Washington and the satellite office in Nashville review approximately 6,000 decisions a year. This is sufficient to give an accuracy rate for regional offices, but is not sufficient to give individual performances.

Individual performances require a second signature; i.e., two people evaluate the decision. Each individual has a quality measure that is monitored through monthly quality reviews. If their quality falls below expected standards, they may receive training, be put on an improvement plan, or receive a 100% review.

Six years ago Veterans Benefits Administration adopted Statistical Technical Accuracy Review, the most rigorous quality review program in the country. It includes over 60 employees, in addition to those at the regional office who do individual performance.

In 2005 the core accuracy rate was 85%. Errors occurred in pay, notification and development, while they are important, they did not affect the veterans' compensation. The STAR staff also conducts specialized reviews of specific issues when required -- women's health issues, for example.

Consistency is also a major factor in the reviews. There has been criticism that different regional offices produce different results, this has triggered a need to look at consistency as an issue.

Inconsistencies are examined by two other people, and it has been found that the reasons for disagreement tend to be quite varied. This phenomenon is attributed in large part to the complexities of the issues of each case.

Issues that create a 15% error rate are usually in the letters sent to the veterans. They fail to list all of the conditions that the veteran might claim. The 825,000 claims that will be handled this year will include claims from previous wars, as well as veterans leaving service this year. Eight or more disabilities will be claimed in 18% of the claims. We try to make sure every disability is evaluated, but the complexity of claims is getting much higher.

Among the regions there is a compensation disparity from highest to lowest of about \$5,500. One of the reasons for the difference is whether the veteran uses the services of a professional in making his claims. Older veterans tend to rely on their initial evaluation and do not return for follow-ups. Retirees tend to get high compensation, and then there is an issue of timely development.

Ionizing radiation cases are relatively few, about 600 per year, this means that an individual rating specialist might see a case every two years. This presents a problem with the initial development of radiation cases in that the rating specialist may not be familiar with that type of case.

Presumptive cases present few problems to the VA. However, where a dose reconstruction is required, a decision is made by the Veterans Health Administration (VHA) using the IREP model. If it is an active cancer, the benefit is 100%, but the errors most often occur in the initial development of the case.

The issues in radiogenic cases are lack of volume at the regional office level, improper referrals to DTRA, and the extremely lengthy process. In the last two years no errors were found in radiogenic cases. VA is not satisfied, however, with its overall performance level. We believe the decision-making is correct, but the process of getting there leaves room for improvement.

The issue of children's disability claims was addressed. There are only two categories of children eligible to submit claims. Further, the updating of IREP will be a decision coming from the VHA.

## VBDR SUBCOMMITTEES

The Board was mandated by Congress to audit dose reconstruction and VA claims decisions for service connection of radiogenic diseases and improve communication with veterans. The Board's mission is also to address veterans concerns about the possibility of an elevated risk of cancer and other illnesses in veterans who were exposed to radiation or fallout from nuclear weapons testing, and the validity of their dose reconstructions.

To accomplish its task, the Board approved the formation of these four subcommittees, their scope of work and their membership. The work of these subcommittees will meet specific requirements of *P.L. 108-183*.

**SC1:** Subcommittee on DTRA Dose Reconstruction Procedures (Mr. Harold Beck, Chairman; Dr. Paul Blake (DTRA liaison), Mr. Paul Voillequé, and Dr. Gary Zeman).

**SC2:** Subcommittee on VA Claims Adjudication Procedures (Dr. Ronald Blanck, Chairman; Mr. Thomas Pamperin (VA liaison), and Dr. James Zimble).

**SC3:** Subcommittee on Quality Management and VA Process Integration with DTRA's Nuclear Test Personnel Review Program (Dr. Curt Reimann, Chairman; Dr. John Lathrop, Dr. David McCurdy, and Dr. Kristin Swenson).

**SC4:** Subcommittee on Communication and Outreach (Mr. Kenneth Groves, Chairman; Dr. John Boice, Dr. John Lathrop, Mr. Ed Taylor, and Dr. Elaine Vaughan).

### ***Subcommittee 1 report presented by Mr. Harold Beck, VBDR SC1 Chairman***

SC1 randomly selected six cases to ensure that it represents the type of cases that NTPR radiation dose assessment contractor has been doing the past few years. The sampling included three prostate cancers, three skin cancers and one thyroid cancer. One veteran had both skin and prostate cancers.

In discussing these cases with the NTPR radiation dose assessment contractor analysts, some issues arose with respect to documentation, calculations and consistency. The audits are not complete, but when they are the results will be posted on the VBDR web site.

Mr. Beck summarized the following preliminary findings of his subcommittee.

1. The most significant area of progress was in the application of the benefit of the doubt and the development of SPAREs.
2. The ability of the NTPR contractor to validate veteran participation through relevant documents was commendable.
3. Analysts are not always consistent in the methodology used for the assessments. This is partially due to mandated changes in procedures.

4. Case file documentation should be improved.
5. NTPR contractors are developing templates to more rapidly perform dose assessments.
6. Skin dose calculations are complicated and uncertain. Based on the average cost of \$9,000 per case, it may not be beneficial to perform skin dose radiation assessments, especially for squamous cell carcinoma.
7. NTPR has not issued a technical analysis indicating that upper bound factors always provide an upper bound dose at the 95th percentile.

While the interim upper bound factors are adequate for generic radiation dose assessment using templates, it is not consistent with the 2003 NAS report or the 2004 report to Congress. It might be reasonable to implement a policy change to require an actual calculation of the upper bound only when the outcome might be affected. Even though the subcommittee found some problems with documentation and some inconsistencies, there were no indications of any errors that might have affected the VA decision on the veterans' claim.

SC1 cannot adequately evaluate the calculation of skin doses at this time because the DTRA methodology has not been formalized and the beta to gamma dose ratio has not been validated.

Plans are to choose another six cases between VBDR meetings and continue interviews with analysts. SC1 will audit 24 cases per year.

He also mentioned that SC1 did not finish reviewing any specific NTPR methodologies. However, there will be an effort to assess both established and new methods. Findings will be reported at future VBDR meetings.

Mr. Beck explained that since Dr. Blake is the NTPR representative, it is not appropriate for him to take positions on the subcommittee's findings. However, he is a valuable member of the subcommittee.

It was suggested that the VBDR should consider requesting a cost-benefit analysis in anticipation of possibly recommending that certain skin cancers be made presumptive for the NTPR program. This generated lengthy discussion. Some members were concerned that the impetus for the change is not new evidence, but rather convenience in processing. Such a change could have major effects on other compensation programs. Based on the Board's discussion, VA and DTRA were tasked with performing a cost-benefit analysis to assess the cost of compensation for skin cancer claims vs. the cost of skin cancer dose reconstructions. The Dose Reconstruction Subcommittee will evaluate this analysis along with their analysis of the uncertainty in performing skin dose reconstructions before suggesting that VBDR recommend any change.



***Subcommittee 2 report presented by Dr. Ronald Blanck, VBDR SC2 Chairman***

The task of SC2 is to review policies and procedures used by the VA and the Veterans Benefit Administration (VBH) for claims by veterans.

At a meeting at the VBH Office in Washington, D.C. SC2 was briefed on the processes and procedures used to adjudicate claims. Since cancers other than skin and prostate are presumptive, the only issue was the timeliness of the claims processing.

Claims can be submitted through any one of 57 VA regional offices. The regional office obtains medical evidence to support the claim and sends a development letter to the claimant. After coordination with the appropriate service (Army, Navy, etc.), the claim eventually is sent to DTRA for dose reconstruction. In spite of efforts at VA to give priority to atomic veteran cases, they are not always expedited as efficiently as one would like.

DTRA conducts dose reconstruction through contractors. This process seems to take the longest. After dose reconstruction, the information is relayed to Public Health and Environmental Hazards for determination of service connection. Very few non-presumptive cases qualify for compensation.

The subcommittee also considered the equity and fairness issue between the presumptive and the non-presumptive cases. Random audits still must be prepared on radiogenic and non-radiogenic claims, and the scientific validity of the decisions must be examined by SC2.

The VA has established an Ionizing Radiation Registry in which more than 23,000 veterans have participated. Further, the VA publishes *Ionizing Radiation Review*, which is instrumental in keeping veterans informed and in educating others at VA and DoD.

Dr. Blanck explained that since Mr. Pamperin is a member of his subcommittee and an employee of the VA, it is not appropriate for him to take positions on the subcommittee's findings. However, he is a valuable member of the subcommittee.

It was suggested that VA should centralize the claims processing within the VA for "atomic veterans" to a limited number of sites staffed with dedicated personnel, and establish a centralized database to track these claims with both input and output information readily available.

***Subcommittee 3 report presented by Dr. Curt Reimann, VBDR SC3 Chairman***

SC3 looked at the scope of work, details of implementation and the core elements of a quality management system. The goal will be to relate to the veteran as a valued customer, as opposed to designing an administrative process.

SC3 will review all aspects of quality management in dose reconstruction and claims adjudication procedures used by NTPR and VA. A quality management system should be

designed and deployed that makes direct contact with, and engenders cooperation with, other VBDR subcommittees.

SC3 outreach was emphasized as it attended other subcommittee meetings and contacted the three services offices to encourage cooperation in the handling of claims. They held meetings with contractors and NTPR to assess their quality management system. They reviewed major issues centered on process reliability and efforts to reduce caseload.

SC3 suggested that DTRA and VA need clearer and wider use of performance metrics and related numerical goals. Use of such metrics should enhance the integration of VA and DTRA work and improve the identification of problems.

***Subcommittee 4 report presented by Mr. Kenneth Groves, VBDR SC4 Chairman***

Changes in SC4's scope were recapped.

SC4 met with the web master for VBDR.org and added attributes to the site that will benefit the Board and the veterans.

In looking for ways to communicate with veterans, Mr. Taylor, along with DTRA and NCRP, compiled a list of veterans' organizations to which press releases for this meeting were sent. It is the goal to reach out to every surviving veteran (from a possible pool of 400,000) to let them know of the Board and its activities.

SC 4 was charged with assisting in selecting meeting locations. Keeping in mind the guidance to meet in areas where there is a high concentration of veterans, locations in California and Texas were identified as possible locations for future meetings.

SC4 has established protocols for responding to inquiries through the web site or through the 800 number. In addition, a PowerPoint presentation (currently in draft form) outlines activities of the Board and gives a brief description of the activities of DTRA and VA.

Mr. Groves attended a meeting of the Advisory Board on Radiation and Worker Health that is a Department of Health and Human Services board with responsibilities similar to the VBDR. They have developed a number of straightforward fact sheets, written in lay terms, which seem to be very beneficial to the recipients. SC 4 will develop similar fact sheets.

To summarize, SC4 will continue to work with all subcommittees, continue to monitor the VBDR Web site, complete the fact sheets, complete the PowerPoint presentation, and continue to develop meeting sites. A possible project might be the development of an oral history program. Based on testimonies from veterans at meetings of this Board, the history might prove valuable and it would come from a rapidly perishing source. He also suggested that future VBDR presentations should address public misapprehension of radiation and a realistic perception of the risk associated with it.

## PUBLIC COMMENT PERIOD

Input from the public was solicited on both days of the meeting and is reported in the meeting transcripts. The following is a list of the members of the public who addressed the Board at the meeting. Verbatim transcripts of the public comments will be made available on the VBDR Web site at <http://vbdr.org>.

**Mr. Carlos R. Contreras**, Atomic Veterans of America; **Mr. Clyde Wyant**, veteran; **Mr. Dale G. Welch**, Atomic Veterans of America; **Mr. John Conrad**, Atomic Veterans of America; **Mr. Eusebio Pontillas**, atom veteran; **Mr. John Pontillas**, son of Eusebio Pontillas; **Mr. Sam Cordova**, Marin Corp Veteran; **Mr. Robert Hampton**, atomic veteran; **Mr. Terry T. Brady**, atomic veteran; **Mr. Jim Malone**, atomic veteran, **Mr. Julian Cohen**, atomic veteran, **Mr. Ramon Garcia**, atomic veteran, **Mr. R. J. Ritter**, NAAV National Commander; **Mr. Charles Clark**, atomic veteran; **Mr. John Bankston**, atomic veteran; **Mrs. Senoth Bankston**, wife of John Bankston; **Mr. David Kocher**, Senior Scientist at SENES Oak Ridge.

## VBDR DISCUSSION POINTS

It is unfortunate it is taking so long to reduce the backlog of dose reconstruction cases. To speed the process, DTRA is working to bring online multiple contract teams to perform radiation dose assessments. Additional funding has been allocated to NTPR in FY06 to expedite reduction of the backlog.

Among other efforts, the NTPR Policy and Guidance Manual has been modified to ensure consistency regarding radiation dose assessments. This change supports the NTPR initiative to bring multiple contract teams online. It is believed that increased competition will eventually accelerate the NTRP backlog reduction effort and reduce the cost per dose assessment.

The Board accepted Dr. Blake's recommendation to discontinue all pending prostate dose reassessments based on the NTPR's analysis of 78 prostate dose reconstructions that were completed after the 2003 NAS report was released. In no case did a reevaluation result in a significant change to the prostate dose.

The Board may make recommendations on modifications to the mission or procedures of the dose reconstruction program if it considers these changes to be appropriate as a result of its audits of dose reconstruction and claims compensation procedures. The Board suggested that it might be wise to look at the cost-benefit analysis of the process that has been established for non-presumptive cases.

SPARE has been a positive step in assisting atomic veterans recollect their experiences.

NTPR has made progress in improving management of claims. There is still room for improvement, especially in dose reconstructions and in explaining the dose reconstruction process to veterans.

In NTPR's new contract, it would be wise to incorporate incentives, technical quality, timeliness and independent review.

The Board emphasized the need for integration and frequent informal communications with its subcommittees and with NTPR and VA.

The Board observed that many of the comments and suggestions from the Board and the public are worthy of major recommendations at the next Board meeting.

Over the next four months, the Board will continue to work on recommendations and guidance in preparation for the third VBDR meeting in Austin, Texas, on June 8-9 2006.

### **FUTURE VBDR MEETINGS**

Following discussion by the Board, it was agreed to hold the third meeting of the Board on June 8-9, 2006, and the fourth meeting on November 9-10, 2006. Details about meeting locations will be announced in the federal register and on the VBDR Web site.

### **BOARD'S RECOMMENDATIONS**

The Board did not make any recommendations at this meeting. However, the Board suggested that the following topics and issues should be discussed at the Board's June 2006 meeting.

1. The proposed discontinuation of revised radiation dose assessments for prostate rework cases. The Board agrees that the reassessment of the 128 pending prostate cases should not be done unless unusual circumstances can be validated.
2. Consider making certain types of skin cancer presumptive. The cost-effectiveness of preparing radiation dose assessments may point toward making some or all skin cancers presumptive. It would certainly reduce the backlog and expedite future claims.
3. VA should select out radiation issues related to claims and refer those issues to a centralized single site staffed with trained and experienced personnel.
4. VBA should establish a centralized database to track radiation issues with both input and output information readily available.

**Dr. Zimble** remarked that a reasonable amount of business had been carried out. He thanked the Board and the staff for their efforts, the public for their comments, and called for a motion to adjourn.

The motion was made, seconded and carried.